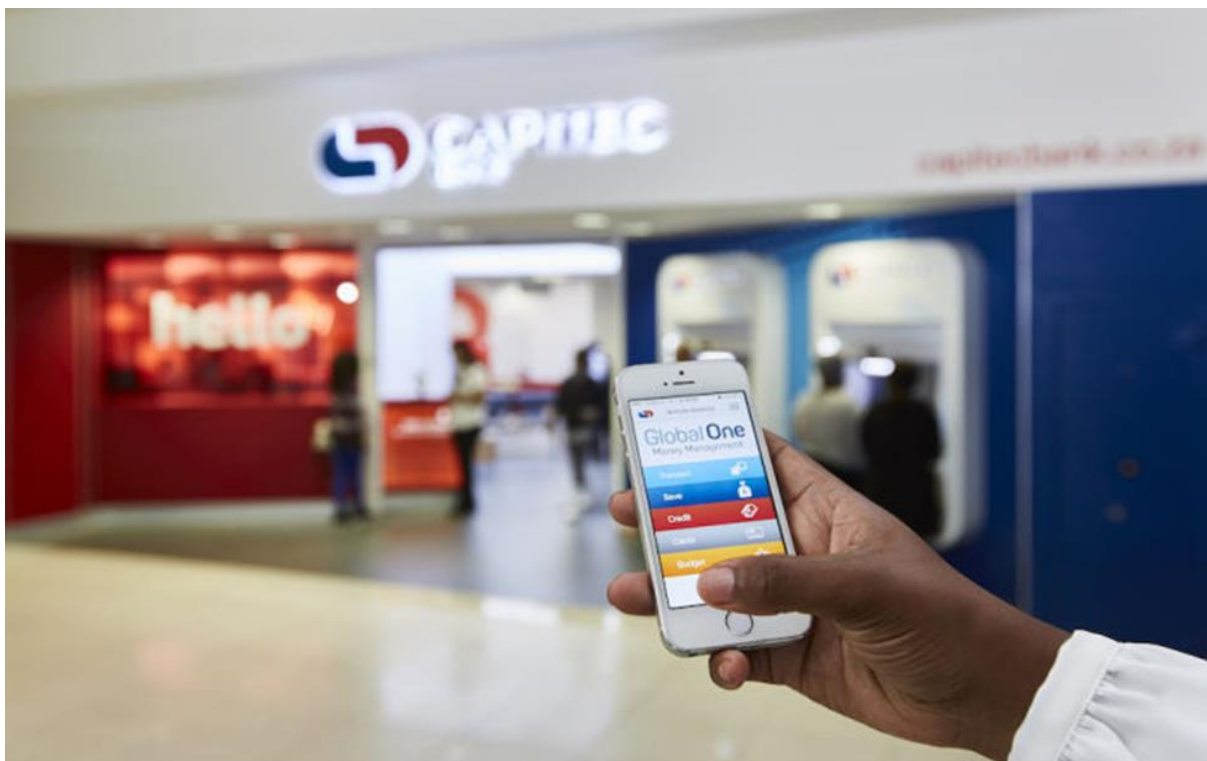




Developing competencies for a just transition of the South African banking sector:

Digitalisation



Source: 702.co.za

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Executive summary

“Ultimately human beings are creatures that seek connection. Robots in a store will never compare to walking into a grocery store and you get asked about your graduation” (Mpupuni, 2019).

Digitalisation and the Fourth Industrial Revolution is a dominant theme of current business, occupation and labour discourse. Depending on the lens or source of information it is seen as a positive or negative, and with reference to jobs the majority paint a generic picture of job losses. This discussion is also set within the context of South Africa’s readiness for the digital ‘revolution’.

This study aims to better understand the potential impact digitalisation will have on jobs and skills in the retail banking sector in South Africa. The intention is to provide an informed evidence-base, from which BankSETA can set out a more informed plan of action and support for its members to transition towards a digital future, with reduced potential job losses, and enhanced just jobs. As such, the objectives of the research were to:

1. Understand the contextual framing of digitalisation in the South African banking sector (with a focus on retail banking).
2. Provide an assessment of the implications and opportunities digitalisation offers from an employment and just transition perspective.
3. Undertake an in-depth case study and primary research to build on the contextual analysis and gather insights from the sector on current skills and occupational challenges and opportunities.
4. Identify occupations and skills required by the sector to transition to a more digital future.
5. Comment on digitalisation and what this means for a just transition within the sector.
6. Provide a key set of findings, recommendation and potential policy implications.

Digital banking describes the incorporation of new and emerging technologies throughout a financial system or organisation. Digitalisation refers to the use of digital technologies and capabilities to move to a digital business by adjusting business models, operational practices and the creation of new services (Behr, 2016; Dasho et al., 2016; Schmidt et al., 2017).

Digitalisation is accelerating at pace, with the banking sector likely to witness more innovations over the next ten years, than in the previous fifty years (CarbÓ-Valverde, 2017). This pace of change is having a profound impact on the world of work and has impacted almost every global sector. This evolution means that banks cannot sit back and watch but are having to strategically consider how they do business now and in the future. Whilst South Africa may be considered a laggard in comparison to its international counterparts, a recent study on digitalisation in Africa suggested that South Africa emerges as the country with the highest potential to realise digital maturity. This correlates with BankSETA’s recognition of the importance of digitalisation in the occupation, skills and competencies space, placing it as one of five strategic focus areas for the sector (BankSETA, 2018).

Whilst the exponential growth of digitalisation in the banking sector is a given, the rate at which its customer-base (and access to the unbanked) could impact on the speed of growth needs to be considered. An estimated 60% of the country’s adult population own smartphones (Bagley et al.,

2012; COEFS, 2017; Dube, 2018; Jordan, 2016; Zylstra, 2018). Whilst this figure appears high, and ownership is on the increase, issues such as poor reception, high data costs and technical illiteracy will hinder increased uptake, and therefore reliable and consistent usage of phones for digital banking transactions. In terms of on-line banking, an estimated 66% of the banked population have on-line accounts and only 23% use digital banking (Pretorius, 2017). This would suggest that there is much room for growth – dependent on technical literacy and increased computer ownership.

Another element of digital banking is that of Fintechs, who can be described as either start-ups or traditional financial or technology organisations that combine technology and financial services to enable, enhance or compete/disrupt the current traditional banking business model by transforming customer applications and back-end office tasks (Bank SETA, 2018; CarbÓ-Valverde, 2017; Fatah, 2018; Zaikovska, 2018). South Africa is home to two internationally recognised Fintech hubs in Cape Town and Johannesburg. Fintech growth in South Africa is expected to be rapid, with EY predicting a 71% forecasted growth rate to a 52% adoption rate (against a current adoption rate of 35%), with current growth and activity in the insurance space (Capital Markets in Africa, 2018; EY, 2017).

The research further built on this contextual framing of digitalisation by undertaking in-depth interviews with Absa, Standard Bank, Investec, The South African Reserve Bank and Sasbo (the Finance Union). These interviews enhanced our understanding, and the opportunities and concerns with regards to the growth of digitalisation on jobs and skills within the just transition context.

The key themes that emerged from the analysis and interviews were:

- **Job losses vs Emergent new jobs and competencies:** Digitalisation will have both a negative and positive impact on jobs and skills, however many suggest that it will tasks that will become redundant and not necessarily jobs. Those most effected will hold more menial or low-skilled jobs, and functions that can be digitalised such as administration, bookkeeping, accounting, auditors, data entry and customer service.
- **New and/or revised occupations and skills will be required for an advanced digital banking sector:** It is recognised that there will be and is a digital skills shortage. Such skills include: creativity, problem solving, maths and science, big data analysis, coding and programming, cloud-based solutions, next generation infrastructure and mobile applications.
- **Unlocking of jobs through the creation of digital financial start-ups:** Fintech growth in South Africa is expected to be rapid, with South Africa third behind China and India in terms of Fintech growth globally. This growth could be expediated if the regulatory environment was less prohibitive, and policy more supportive.
- **Lack of women recruits holding digital jobs within the sector:** It was noted that digital positions tend to be held by males, given its perceived technical-focus, and therefore historically not considered by, in particular, black women.
- **Digitalisation can provide banking access to the ‘unbanked’ and rural households:** It has the potential to democratise access to data, enhance informed financial decision-making and to financially support rural economies, thereby making the financial system more inclusive.

For BankSETA to adequately respond to these findings, the following recommendations are suggested:

- Ensure that as digitalisation is one of BankSETA’ s five strategic priorities, the findings of this study are used to inform BankSETA’s strategic direction and decision-making and to support

the banking sector to revisit their business models, with a particular lens on education and training to aid the transition.

- To work closely with Sasbo, and BankSETA members to identify specific jobs most at risk – when are these likely to become defunct (time period) and identify feasibility of transitioning or upskilling these individuals to continue to be employed within the sector. For jobs that are the most precarious, identify upskilling opportunities to retain these individuals within the sector.
- It is recommended that BankSETA promote and support work-place-based upskilling opportunities (building on internal training already offered by banks), and to work with DHET to establish/support a BSc in Information Technology, specialising in digitalisation (incl. specialisms in digital product management, software development or user-experience/visual design).
- Recommendation to provide bank HR departments with occupationally-directed guidance to inform job descriptions requiring digital skills and experience, work-sector plans etc to accurately accommodate digitalisation needs.
- Recommend working with the DUT Digitalisation chair to review the current OFO framework to identify current occupations and align these with emerging digital jobs. If not a new occupation, to ensure skills listed in the OFO adequately accommodate digitalisation.
- It is recommended that BankSETA considers providing business, banking and financial management advice and training for Fintech start-ups to ensure they can overcome the initial challenges of setting up a business in the sector and ultimately becoming financially sustainable – thereby creating more opportunities for job creation. This could be done in collaboration with the Fintech hubs in Cape Town and Johannesburg.
- BankSETA to run a series of campaigns/career guidance to encourage young women to enter the banking sector, with a focus on digital jobs.

As noted, several recommendations involve BankSETA's collaboration with a broader stakeholder community in order to best mitigate any issues, and/or enhance the delivery of solutions to ensure a best fit and uptake by the banking sector.

In conclusion, digitalisation of the banking sector has much potential, with the opportunity to create exciting new jobs, the upskilling for those currently in the sector's employ or democratising the sector by providing facilities for the unbanked or job creation through Fintechs. However, there is a word of caution – some jobs will be lost and it will be important to accurately identify these and mitigate the impact in a timely manner; women need to be encouraged to take up digital jobs; and from a customer perspective issues of poor telecommunication infrastructure and technical and banking illiteracy need to be accommodated, and where necessary assistance provided by BankSETA and the sector to overcome these issues.

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Introduction

Current business discourse, the popular press and labour and economic research is littered with references to digitalisation and/or the Fourth Industrial Revolution. Depending on the lens or source of the information the digital revolution is seen as a positive or negative, and with reference to jobs the majority paint a generic picture of associated job losses. This discussion is also set within the context of South Africa's readiness for the revolution – for example the revolution is inevitable and if we don't 'jump on the bandwagon' we'll be left behind. Another dimension of the discussion is its futuristic nature, with the type of language and images used often depicting human-like robots, space ships, and galaxies in outer space. Such depictions provide a sense that digitalisation and automation are out-there activities that will disconnect and, in many cases, overtake humans in the workplace.

However, having investigated the global and South African digital context and status generally and within the banking sector, it becomes apparent that such generalist commentary does not adequately reflect both workforce adjustment (and potential losses) but also opportunity. What does come to the fore is that digitalisation is here and will be adopted exponentially – this will impact on jobs resulting in change either to current jobs or in the creation of new jobs. These are likely to be jobs that do not even exist today. The change referred to encapsulates both redundant tasks and occupations, with many suggestions that it will be the actual tasks that will be significantly 'disrupted' by digitalisation and not necessarily actual job numbers.

With regards to digitalisation and changes to jobs – the question arises as to whether South African banks and the financial sector are ready to make this adjustment and whether we have the adequate future supply of skills required to function within an undisputed exponential transition to digitalisation? The types of skills mentioned for such a transition include for example creativity, problem solving, maths and science, big data analysis, coding and programming. Given the state of our current basic education system, a significant gap looms between supply and demand.

Whilst digitalisation might seem for some as an ogre looming on the horizon, within the context of South Africa it does have the potential to democratise access to data, enhance informed financial decision making and support rural households and economies. This can be achieved through digital activities such as mobile-banking and cashless payment systems. Such 'benefits' and opportunities are aimed to attract the 'unbanked' into the financing ecosystem and enhance and enable small-business development in rural areas. By providing such access and ability for anyone to compete within the market, financial digitalisation can make the financial system more inclusive.

Therefore, the objectives of this research were to:

1. Understand the contextual framing of digitalisation in the South African banking sector (with a focus on retail banking).
2. Provide an assessment of the implications and opportunities digitalisation offers from an employment and just transition perspective.
3. Undertake an in-depth case study and primary research to build on the contextual analysis and gather insights from the sector on current skills and occupational challenges and opportunities.
4. Identify occupations and skills required by the sector to transition to a more digital future.
5. Comment on digitalisation and what this means for a just transition within the sector.
6. Provide a key set of findings, recommendation and potential policy implications.

This report presents an analysis of the context within which digital banking is emerging in South Africa and explores the opportunities and potential concerns associated with the exponential growth of digitalisation in the sector. This is presented in the form of a contextual analysis, which provides (and provided) a platform for undertaking a more in-depth primary analysis of digital banking in the sector. Drawing on interviews with Absa, Standard Bank, Investec, South African Reserve Bank and Sasbo (the Finance Union), the second half of the report provides insights on the sector’s response to the impact of digitalisation on the sector, with a focus on occupations, job creation and skills requirements for the sector. Given the focus of this broader study on digitalisation and a just transition of the sector a critique of digitalisation is presented, with reference to the ethical, transformation and polarisation potential of digitalisation within the sector.

The final section of the report presents a set of occupations that are gaining prevalence within the sector as a result of digitalisations. This includes alignment with the Occupational Framework (OFO), recommendation of required skills, knowledge base and occupational network within which the occupation is likely to operate.

Digital banking terms and definitions

Digital banking describes the incorporation of new and emerging technologies throughout a financial system or organisation and encapsulate two elements: digitisation and digitalisation. **Digitisation** refers to the use of digital means to optimise existing resources and processes by making them more efficient and effective, whilst **digitalisation** refers to the use of digital technologies and capabilities by an organisation to move to a digital business by adjusting business models, operational practices and the creation of new services., with both impacting on customer and employee interactions (Behr, 2016; Dasho et al., 2016; Schmidt et al., 2017).

With a transitioning system emerges a new language to code and aid conversation and action. The world of digital banking is no different, with new terms arising on an almost daily basis, with many overlapping. Some of the more commonly-used terms and definitions are listed below:

Table 1: **Commonly used digital banking terminology**

Term / definition	Description
<i>Artificial intelligence (AI)</i>	Example AI applications may include providing customer greeting and assistance or investment advice.
<i>Automated Teller Machines (ATMs)</i>	An automatic banking machine which allows customers to complete basic banking transactions, such as withdrawing and depositing money and printing bank statements, without the help of banking staff.
<i>Blockchain</i>	Originally devised for the cryptocurrency, Bitcoin, blockchain is an incorruptible digital ledger for economic transactions that can be programmed to record and distribute digital information such as financial transactions, and virtually anything of value.
<i>Chatbots</i>	Consumer instant messaging through apps that provide real-time assistance. They are a way for banks to respond promptly to customers, yet also significantly cut customer care costs.
<i>Contactless payments</i>	Payments made by waving or tapping a contactless device – usually a card or smartphone – over a reader, which then accepts the payment.

<i>Cryptocurrency</i>	A digital or virtual currency designed to work as a medium of exchange. It uses cryptography to secure and verify transactions, as well as to control the creation of new units of a particular currency. The most commonly known is Bitcoin.
<i>Digital wallets</i>	An electronic device or service (such as PayPal) that allows an individual to make electronic transactions, such as purchasing items online with a computer or smartphone. Sometimes also referred to as an e-wallet.
<i>e-banking (electronic)</i>	Remote banking performed electronically without visiting a bank branch. It incorporates the systems and devices that enable customers to transact remotely.
<i>Fintech</i>	Start-ups and established financial and technology companies combining innovative business models and technology to enable, enhance and/or replace traditional financial services (see the Fintech vignette for a more detailed discussion)
<i>Mobile / cell phone banking</i>	Refers to the use of technology devices e.g. smartphones, tables, wearables (e.g. smart watches), laptops and computers to carry out banking transactions.
<i>Online / internet banking</i>	Allows bank customers to access and manage their accounts and make payments from anywhere at anytime through a mobile device or computer.
<i>Smart-branches</i>	A technically and digitally-centred physical bank, implementing a range of technology solutions to provide a variety of services e.g. interactive teller machines, remote tellers, video-conferencing, service terminals, robot greeter and interactive digital walls.

Sources: (AL-Zahrani & Almazari, 2015; Assensoh-Kodua, Migiro, & Mutambara, 2016; Bagley et al., 2012; Bank SETA, 2018; Blockgeeks, 2018; Coin Telegraph, 2018; Consultancy.co.za, 2017; Dallerup & Jayantilal, 2018; Eddie-Obiakor, 2018; Elprocus, 2018; Money Super Market, 2018; Zaikovska, 2018)

A contextual analysis

A pivotal turning point in the discussion and impact of digitalisation and how it will transform the 'world of work' occurred with the launch of the World Economic Forum's (WEF) *Future of the Internet Global Challenge Initiative* in 2015, and subsequent publication *Digital Transformation of Industries: Demystifying digital and securing \$100 Trillion for society and industry by 2025* (World Economic Forum, 2015). This internationally recognised and seminal piece of work acknowledged that the role of digital technology is no long a fringe activity but is rapidly shifting industry and enabling fundamental innovation and disruption. This initiative continues to be a core focal point and benchmark for global digital activities and progression. Of interest to this study is that this report explored a number of common and pervasive myths about digitalisation and the actual realities, notably (World Economic Forum, 2015, p. 5):

- A. Myth: Digital is the next dot.com bubble, and the fad will end soon.**
Reality: The train is leaving the station, and individuals and organisations need to get on board quickly.
- B. Myth: Digital transformation will widen inequality in developed and developing markets within a generation.**

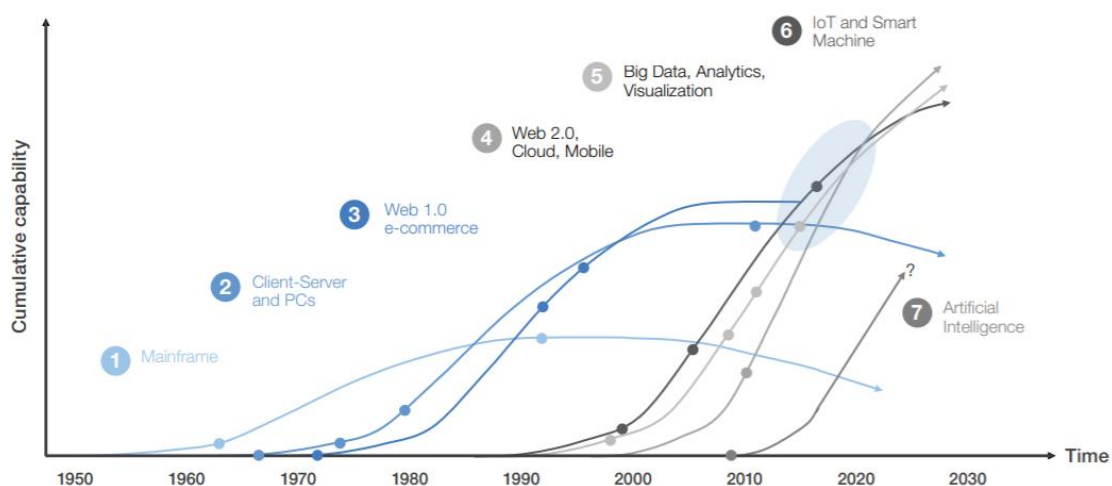
Reality: As in previous industrial revolutions, some workers will be displaced by new technology, but digital also has the potential to promote inclusive growth. [This argument is regularly cited when the issue of job losses and digitalisation are raised. The question is, is this the case for South Africa?]

C. *Myth:* Incremental reform to regulation will be sufficient to keep up with digital innovation.

Reality: New frameworks are needed for regulation to remain relevant and not inhibit the realisation of societal and industry value.

What is also clear from this report and subsequent commentary on the subject is that digitalisation is accelerating at pace, as is clearly illustrated in Figure 1 below, with digital intensity having evolved from the 1980s with the introduction of the internet and associated digital activities. Carbó-Valverde (2017) suggests that over the next ten years, the banking sector will witness more innovations than in the previous fifty years.

Figure 1: The combined effect of new technologies contributing to accelerated pace of change



Source: (World Economic Forum, 2015, p. 6)

This accelerated pace of change is having a profound impact on the world of work and has impacted almost every global sector. This in particular has affected how consumers interact, behave and develop expectations from suppliers and providers, such as banks (Bagley et al., 2012). Digitalisation is shifting 'control of ideas' and business-models to those which are consumer-centric and open i.e. anyone with the will and the means can provide a service or product. Digitalisation also opens up numerous channels or touch-points for customers, whereby businesses have had to adopt omni-channelled models to meet consumer needs from any place at any time (Dallerup & Jayantilal, 2018). As such, the banking sector finds itself in a space where there are more ways to do banking than ever before; with financial transactions no longer the preserve of traditional banks, but inclusive of disruptive competitors (Anon, 2017; Pretorius, 2017).

This significant and rapid evolution means that banks cannot sit back and watch, but are having to strategically consider how they do business now and in the future to 1) ensure their customers have a satisfactory digital experience, 2) remain competitive and retain and/or attract new customers in a

changing stakeholder landscape, and 3) keep up to speed with a rapidly changing technical landscape (Bagley et al., 2012; Capco, 2018).

The points highlighted above indicate some of the perceived and actual benefits of digital banking. Table 2 below lists some of the main associated benefits identified for both the banking [and wider financial] sector and customers.

Table 2: Associated digital banking benefits

Benefit category	Banks / financial service providers	Customers
Operational optimisation	<ul style="list-style-type: none"> - Improved efficiency and effectiveness - Lean channel and organisational structures - Streamline processes (reduced activity in silos) - Improved agility and iterative response rate to customer demands/ problems - Integrated IT structure - Improved cross-border movement of funds 	<ul style="list-style-type: none"> - Improved efficiency and effectiveness - Improved response rate from banks/service providers - Fluid and seamless action
Cost	<ul style="list-style-type: none"> - Lower transaction costs - Estimated 20%-30% improved revenue through digital transformation - Attractive investment proposition due to low cost-to-serve - Customers willing to pay for digital 'add-ons' if enhance their experience, convenience etc 	<ul style="list-style-type: none"> - Transparency and comparability of product and service costs
Experience	<ul style="list-style-type: none"> - Ability to respond to increasing youth technical competence 	<ul style="list-style-type: none"> - Enhanced customer satisfaction and functionality - Individualised customer experience - Enhanced purchasing / shopping experience (e.g. instant, on-line, convenient) - Improved data visualisation and real-time information
Access & security		<ul style="list-style-type: none"> - 24/7 access (from almost anywhere) - Virtual access (no need to visit a physical branch) - Democratised access to financial services - Secure access and processing - Access from multiple digital devices
Customer-base	<ul style="list-style-type: none"> - Ability to target youth and build up a lifetime relationship - Tap into the 'unbanked' population 	<ul style="list-style-type: none"> - Access to a wider variety of products and services from a variety of providers

	<ul style="list-style-type: none"> - Increased sales through provision variety products and services 	
Big data access & advanced analytics	<ul style="list-style-type: none"> - Exploitation of customer data to enhance customer experience (problem solving, notifications, sales etc) - Enhanced real-time customer insights to predict behaviour - Advanced analytics accelerate decision support and identify growth opportunities 	

Sources: (AL-Zahrani & Almazari, 2015; Bagley et al., 2012; Behr, 2016; Capco, 2018; CarbÓ-Valverde, 2017; Chandra, Plaschke, & Seth, 2018; Dagada, 2013; Dallerup & Jayantilal, 2018; Dube, 2018; González-Páramo, 2017; Hesse, 2018, 2018; Kamutuezu, 2016; Marous, 2018; Olanrewaju, 2014; Pastore, Pratz, & Desmares, 2013; Pretorius, 2017)

Bhandari (2016) suggests we are at that the dawn of cashless as witnessed in Sweden and Denmark becoming, which are almost completely cashless. This is not just the reserve of developed nations, with Kenya regularly cited for its innovative digital and cashless financial systems, in particular M-PESA (Attfield & Goldstein, 2014; Murithi & McCaffrey, 2015).

This shift requires a shift in business models and operations, such as moves towards transitioning data storage and operating systems to ‘the cloud’ and shrinkage of infrastructure, such as physical banks, which can lead towards operation cost savings of 30% (ORS Group, n.d.). Whilst many of the Scandinavian and UK banks are setting this path, it is argued that the majority of banks – with particular reference to South Africa - have invested most of their digital shift and innovations in the area of payments to maximise efficiencies by shifting menial teller and back-office tasks to digital; and to enhance the customer experience through multiple channels (Behr, 2016; Dallerup & Jayantilal, 2018; Lourie, 2017). In comparison to the ‘trail blazers’ this laggard status in the banking sector is put down to a lack of funding and regulations, in particular restricting an enabling environment for start-ups, disruptors and Fintechs (Lourie, 2017). But is this enough? In an insightful article on ‘Finance and accounting in the digital economy: Opportunities for Africa’ Eddie-Obiakor (2018) notes that the digitalisation of the banking sector is more than a shift from the traditional to the digital i.e. a shift in tasks and efficiencies; but “it begins with an understanding of digital trends, new technologies, ICT services, cyber policies and many other elements of the internet of things.”

Digitalisation and the South African banking sector

Whilst the South African banking sector could be considered a digital laggard in comparison to its international counterparts, digitalisation (and technology and analytics) is recognised as a strategic focus area for the sector; and is one of the BankSETA’s five strategic priorities (BankSETA, 2018) (to which this research responds). This correlates well with the country’s readiness to realise a digital transition, with a report by Siemens (2017) on African digitalisation maturity, suggesting that South Africa emerges as the country with the highest potential to realise digital maturity, followed by Kenya, Nigeria and Ethiopia. In addition, the South African banking sector has embraced and embedded digital mechanisms such as blockchain, digital wallets, cryptocurrency, online and mobile banking – all of which are transforming the South African banking landscape. The emergence of Fintech companies further disrupts and challenges traditional banks, resulting in a competitive and intensified digital transformation (Mandela, 2018). Nedbank’s Chief Operating Officer, Mfundo

Nkuhlu, acknowledged the Fourth Industrial Revolution had disrupted the industry in a way that was well known in business today, “we are all challenged to revisit our business models,” he said (Cassidy, 2016).

Running parallel to the digital transformation experienced and implemented by the banking sector, is the rate of consumer digital transitioning. South Africa’s consumer access to technology and penetration levels have been significant and are changing the way businesses, including banks, respond to their needs and expectations (Bagley et al., 2012). A number of specific reasons or drivers have been suggested to explain this exponential growth (and potential for future rapid growth):

- **Internet and cell phone penetration** – these two channels are inextricably linked. With ever-growing ownership of cell phones (notably smartphones) access to the internet shows an increase allowing millions to conduct banking transactions without having to go into a bank (Bagley et al., 2012; Dagada, 2013). Depending on the information source, an estimated 51% to 69% of the country’s adult population own smartphones, and between 80%-90% own cell phones – the cell phone penetration rate is one of the highest in the world (Bagley et al., 2012; COEFS, 2017; Dube, 2018; Jordan, 2016; Zylstra, 2018). An estimated 52% of smartphone users use their phones to access the internet (and therefore the opportunity to access online banking services)(Zylstra, 2018). Internet penetration is estimated to sit at approximately 52% of the population (whether by phone or computer)(COEFS, 2017).

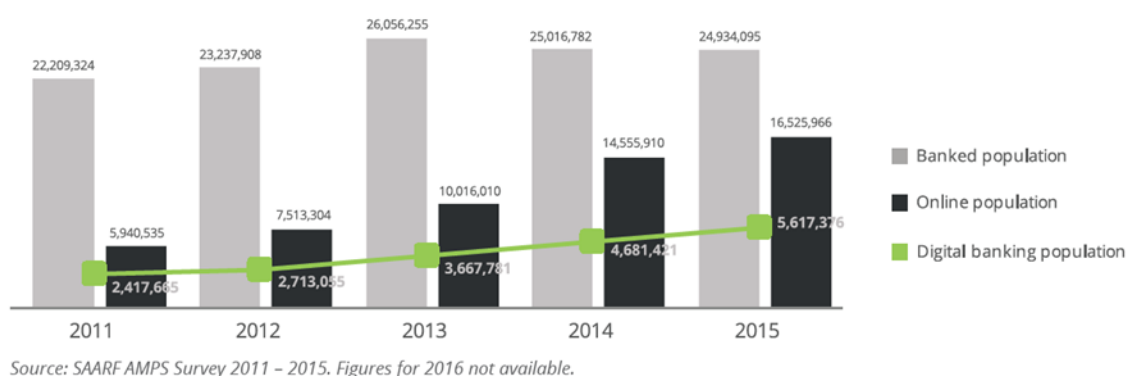
Given the annual increase in smartphone ownership, a correlated increase in transitioning from 1) traditional banking to online/digital banking; and 2) being unbanked to having a banking account will also increase. However, there can be a lag effect between smartphone ownership or access to the internet to active engagement in high-level applications, such as banking or retail transactions. Goldstuck (2010) refers to this as the ‘digital participation curve’, which he suggests can take up to five years for an internet user (aka smartphone user) to transition to active high-level engagement.

In parallel with cell phone penetration is the increasing use of ‘wearables’, such as smart watches to undertake banking transactions. Whilst the ownership of these devices may still be small in comparison to smartphone ownership, wearable Fintech solutions for ‘wearables’ are becoming more widely available, enabling users to undertake banking transactions and pay for their shopping, such as Fitbit Pay (Walker, 2018).

- **Rise of an online and digital banking banked population** – more broadly within Africa the number of the mobile banked population exceeded the number of traditional bank accounts, reaching an estimated 280 million digital accounts by the end of 2017 (Bhan, 2017; Fatah, 2018). This correlates with the figure that over half of all mobile money services operating globally are located in sub-Saharan Africa, and far exceeds adoption in South Asia (the second biggest region for mobile banking)(Fatah, 2018).

Figure 2 below shows South Africa’s online and digital banked population profile from 2011 to 2015, and the growth that has taken place over the intervening years. Of the approximate 25 million banked population, more than half (66%) have online accounts, of which 23% use digital banking.

Figure 2: South Africa's online and digital banking population



Source: (Pretorius, 2017).

Digital disruptors: The rise of Fintechs

A variety of definitions exist to describe Fintechs – all tend to suggest that Fintech's are either start-ups or traditional financial or technology organisations that combine technology and financial services to enable, enhance or compete/disrupt the current traditional banking business model by transforming customer applications and back-end office tasks (Bank SETA, 2018; Carbó-Valverde, 2017; Consultancy.co.za, 2017; Fatah, 2018; ORS Group, n.d.; Zaikovska, 2018). One of the key areas of focus Fintechs, is their desire to enhance customer experience



Fintech operations can be classified into five categories, with most focusing on one of the main components within the financial value chain: money transfer and payments, borrowing, savings and investment, financial planning, and insurance. Much of the global focus to date has been on payment services (Consultancy.co.za, 2017; EY, 2017; Fatah, 2018; González-Páramo, 2017).

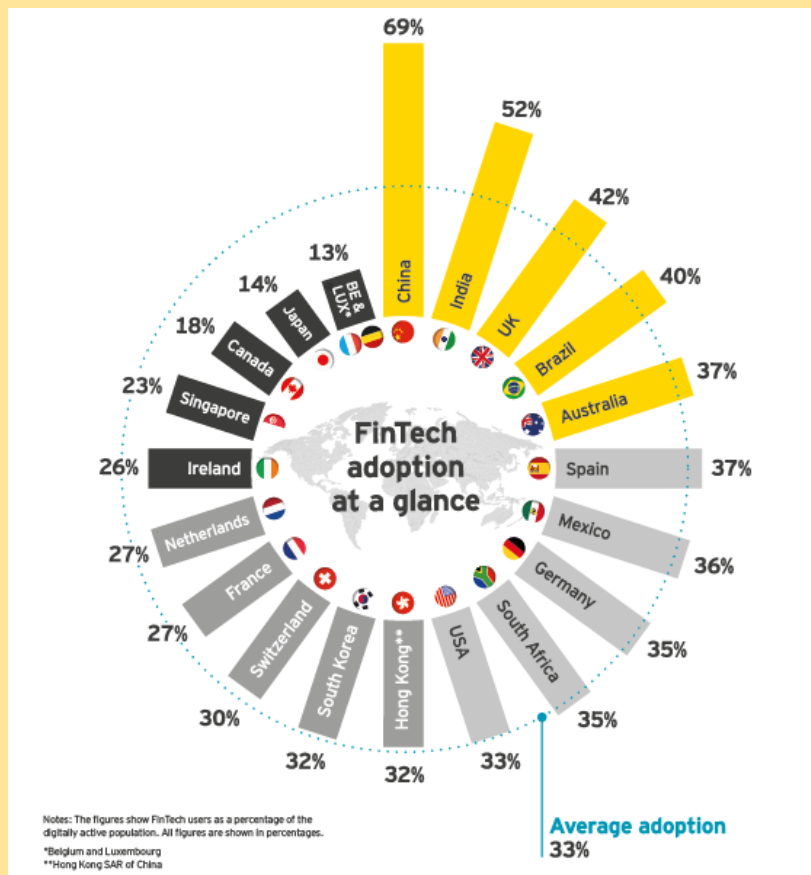
Whilst many Fintechs have the luxury of not having to start whilst maintaining a physical distribution network (as per traditional banking) they will often develop or transition towards collaborating with a traditional bank. It is suggested that this collaboration is likely to be spearheaded by the traditional banks who wish to acquire future competition and/or add to their omnichannel services and enhance their market competitiveness and customer offerings (Carbó-Valverde, 2017; Lourie, 2017).

South Africa is home to two internationally recognised Fintech hubs in Cape Town and Johannesburg. Both cities host several Fintech incubators which provide start-ups with networking opportunities and entrepreneurial support. Many of these start-ups are supported by traditional banks and universities, with the sector attracting significant international and national investment (Capital Markets in Africa, 2018; COEFS, 2017; Lourie, 2017; Tshabalala, 2017).

Fintech growth in South Africa is expected to be rapid, with EY predicting a 71% forecasted growth rate to a 52% adoption rate (against a current adoption rate of 35%). This is substantial, ranking South Africa third behind China and India (see Figure 3 below). The predominant current South African Fintech activity is in the insurance space (Capital Markets in Africa, 2018; EY, 2017).

Given this exponential and rapid growth, the South African Reserve Bank (SARB) has set up a dedicated Fintech monitoring team as it recognises the sector holds much economic and socially-beneficial promise for the country (Capital Markets in Africa, 2018; Mandela, 2018). Such 'promise' is assumed to be realised through providing South African citizens with access to financial services and enhancing their engagement with the.

Figure 3: 2017 global Fintech adoption rates, per country



Source: (EY, 2017)

With on-line shopping and digital financial transactions heading in a strong upward trajectory, the Fintech revolution in South Africa is set to expand rapidly. From the perspective of the Fintech sector, this means a competitive environment in which skills and capabilities will be required to not only develop, implement and maintain an attractive product or service, but to also collaborate and negotiate with beneficiaries and potential competitors. This provides a rich opportunity for increased job opportunities, upskilling or skills transitioning from the traditional banking and technology sectors.

From the perspective of the customer, the rise of Fintech applications and smartphone ownership allows for an improved user experience and access to a variety of financial services at anytime of the day from anywhere in the world. This has the potential to enable a democratisation of job

opportunities and potential, particularly in rural areas, thereby stimulating improved livelihoods in these areas. Technical and digital literacy skills will run alongside the need for business and customer skills to operate in this space.

Barriers to a digital transformation

Having introduced the South African digital banking landscape rather positively, one would be forgiven for assuming the future is rapid, expansive and bright. However, the country's digital banking transformation needs to overcome several barriers to achieve this recognised [and arguably perceived] potential.

For the customer, **internet and cell phone data affordability, availability and stability** of the service is paramount to digital use. This cannot be underestimated, with only an estimated 37% of South African households having consistent internet access via phone or computer (Bagley et al., 2012; COEFS, 2017; Hesse, 2018; Nayak, 2018; Siemens, 2017). South Africa's cost of internet access is relatively high, with mobile broadband fees being 10 times higher than those in the United Kingdom and five times higher than the United States (Siemens, 2017). Running alongside internet and cell phone access is the issue of a **stable and consistent power supply** to charge and power phones, computers and associated equipment.

Customer technical literacy – particularly in rural areas where people are more likely to be new smartphone owners and users, or the elderly who are adapting to a digital world and reliant on old technology. The question will be how does the sector transition yet adequately accommodate the diverse technical capabilities of their customers? This issue was recognised as a key issue in the Department of Trade & Industry's (DTI) proposed adaptation of South Africa's industrial policy (COEFS, 2017; Creamer, 2018; Hesse, 2018; Nayak, 2018).

It is challenging traditional banks such as First National Bank, Standard Bank, Absa and Nedbank to **transition from physical, cash-oriented entities to digital, customer-centric organisations**. They were established at a time when physical attributes were core to operations (buildings, humans and cash) and it is a challenge to transform these large long-standing, embedded ways of operating to a digital and customer-centric model (BSG, 2016; Marous, 2018; Rossi, 2017). Therefore, the vision of the bank's leadership, and adaptability and agility are key to envisioning a digital future and how the organisation will enhance their front- and back-end technological, financial and organisational capacity to do so (González-Páramo, 2017; Hamilton, 2018).

Dis/enabling regulation and legislation – regulators and policy makers in this rapidly changing space can either unlock change or inhibit it through the role they play in developing relevant and supportive policy and legislation. Regulation, for example, has not provided an enabling environment for Fintech development in this country. There is a lack of clarity and guidance on how the existing financial regulations apply to Fintech businesses. This has resulted in significant compliance risks for Fintechs (COEFS, 2017; Creamer, 2018). In addition, there is likely to be a cost to the financial entity to comply with adapted or new legislation (BSG, 2016; González-Páramo, 2017). Another inhibitor is the country's industrial policy, which has not been updated since 2009 (almost ten years ago!) and therefore does not adequately capture technological and digital advancements that are disrupting all sectors (Creamer, 2018). Having said this, there does seem to be a tremendous amount of discussion and activity in the government, business and public arena on digitalisation, with digitalisation appearing as a core focus area for research (such as this study), forums and conferences. Only this year did South Africa hold its first significant digital industrial policy

colloquium (hosted by the Industrial Development Think Tank) to assess adaptations to the 2009 policy. Key areas of discussion covered improvement of digital literacy and skills, lowering the cost of data, improving broadband penetration and an enabling regulatory regime (Creamer, 2018).

These regulatory stumbling blocks are however not found in the space of cryptocurrencies, where South Africa is notably advanced, with the South African Reserve Bank having released a position paper on virtual currencies in 2014, and are currently trialling cryptocurrency regulations to recognise and regulate digital currencies as legal tender in the country (Ecobank, 2018).

Security, trust and acceptance of new entrants – with rapid change and an increasing number of new entrants in the financial space, customers need time to compare, assess, understand, accept and select the various digital options available to them. According to Dube (2018) this can take a number of years, with Capitec for example having taken almost 8 years to make an impact and become an effective competitor in the South African banking landscape. Associated with acceptance and trust is customer confidentiality, particularly around data access and management. South African customers are extremely concerned about digital banking crime, as such they need assurance that their money is safe and their data secure. Banks will need to make a concerted effort to build trust with their customers if they wish to survive in this competitive environment (Carbó-Valverde, 2017; Cassidy, 2016; Dagada, 2013).

Job insecurity and likely losses – it is evident from the research that jobs will change and with this the type of skills required to operate in a rapidly changing digital banking environment. This shift will be most evident with lower-skilled and menial functions or tasks towards the need for higher-skilled individuals. This transition and potential implications for the South African banking sector are discussed further below.

Shortage of individuals with technological and digital skills and experience – there is a recognised shortage, not only in South Africa, but also globally – which will hinder the rate of digital transformation in the banking sector (Chandra et al., 2018; Meads, 2017). Skills shortages of particular relevance to the banking sector include cloud-based solutions, next generation infrastructure and mobile space (CSRNEWSA, 2017).

Job security and skills transformation

Whilst the significant opportunities and almost unstoppable transitioning towards a digital-centric world are apparent, the underlying concerns of job security and loss are ever present. Particularly in a country such as South Africa where unemployment, in particular youth unemployment (the digital generation), is high (27% of the working-age population, and 38% respectively)(StatsSA, 2018). Could digitalisation exacerbate or alleviate this situation? This discussion is explored further below, and suggests the answer is not as straightforward as a yes or no.

Digitalisation and the impact on job security

Concerns are regularly voiced about how automation and digitalisation will result in job losses or a jobless future. The jobs that are most likely to be affected are low-skilled or menial, therefore most likely to significantly impact low-qualified or 'blue-collar' workers (Arntz et. al., 2016; Heerden, 2018). In his article on 'Digital automation a threat to SA employment and economy', Booyen (2018) suggests that such an impact would translate to 35% of South Africa's jobs (nearly 5.7 million) – in comparison to a 9% job loss average likely to be experienced by Organisation for Economic Co-

operation and Development (OECD) countries (Arntz et al., 2016). For South Africa this could worryingly mean 1 in every 3 jobs, or 1 in every 10 jobs in OECD countries are lost to automation.

This threatened insecurity translates to the banking sector (Kamutuezu, 2016; Pastore et al., 2013), and little wonder when images of anthropomorphised-robots and distant galaxies accompany popular press and social media discussion on automation and digitalisation in the sector. Digitalisation will disrupt the entire banking value chain, and as such jobs and tasks will be impacted as physical branches close down and financial institutions transition to digital business models (Bhandari, 2016; Dasho et al., 2016). In terms of scale, the Citigroup (an American multi-national investment bank and financial services organisation) suggests that **up to a third of all jobs in the banking sector could be lost** (between 2015 and 2025) – particularly in retail banking (Dasho et al., 2016; Marous, 2018; Shukla & Rebello, 2017).

Some of the most at risk banking and finance-related jobs are or encompass **administration** (e.g. opening a bank account), **bookkeeping, accounting, auditors, insurance claims, data entry, customer service** (e.g. information provision), **financial assistance** and **tellers** (S. M. Arntz et al., 2016; Bagley et al., 2012; Booysen, 2018; Capco, 2018; Clausen, 2018; Shukla & Rebello, 2017). In such cases, automation could take over completely (Arntz et al., 2016; Dash, 2018). In particular, it is specific tasks that are likely to become redundant – such as those that are menial and repetitive. In their defence, banks transitioning to digital and replacing such tasks, suggest that this move reduces human error and transaction times and therefore emphasise the cost saving value of such a move (AL-Zahrani & Almazari, 2015; Hamilton, 2018; Tshabalala, 2017).

Should physical bank branches remain, these are likely to transition to smart or ‘hub and spoke’ branches which will employ only three to eight people (depending on size), in comparison to a ‘typical’ branch employing 10 or more staff (Bagley et al., 2012;Codigo, 2017; Dallerup & Jayantilal, 2018).

In the case where identified occupations and tasks are at risk, it is those that have been working long-term in the banking sector that feel most at risk (Clausen, 2018) – such concerns were mirrored in a study on the impact of digitalisation in Nigerian banks where an increase in digitalisation led to an increase in early retirement (Atiku et al., 2011). According to Al-Zahrani & Almazari (2015) when investigating the impact of digitalisation on Saudi banks, they expressed concern that most banks transitioning are more concerned about providing the best services to customers and gaining profits than thinking of the adverse impact on employees. Such a finding is exacerbated by comments such as ‘the best back office, is no back office’ (Behr, 2016). If such sentiments are mirrored in South Africa, then the job loss concern by banking sector staff is warranted. And they are. This concern has been raised by South African Society of Bank Officials (Sasbo) – the banking sector’s employee representative union – who are in regular consultation with banks to try to reduce the number of job losses due to digitalisation in the sector (Bonorchis & Burkhardt, 2016). Both First National Bank (FNB) and Nedbank have reported intentions to cut jobs as branches close – both citing customers switching to digital banking as the reason for their actions (Bonorchis & Burkhardt, 2016; Sasbo, 2018).

It should be noted however, that recent job losses in the South African banking sector are not always attributed digitalisation – they can also be a direct result of a declining customer base in agricultural towns that have been affected by drought (as was the case with the closure of three FNB branches in the Free State in 2017) or collapse of a bank due to financial irregularities and mismanagement (such as the recent failure and closure of VBS Mutual Bank)(Molefe, 2018; Setena, 2017).

Digitalisation job opportunities and less at-risk jobs

Running in conjunction to the debate on job losses and insecurity in the banking sector (and wider digitalisation debate) a set of discourse on job opportunities and skills upgrading occurs. Reports produced by Arntz et al. (2016a; 2016b) for the World Bank and OECD respectively suggest the number of job losses portrayed due to digitalisation are often an overestimate and a task-orientated approach to assessing the impact digitalisation will have on jobs is more appropriate and representative of the change.

Whilst the jobs or tasks that are the most manual or at highest risk of automation, it is suggested that jobs and tasks that require a more human-like element, such as creativity, empathy and face-to-face interaction are less likely to become redundant (S. M. Arntz et al., 2016; Booyesen, 2018). This also includes leadership and management. For example, automation will require human supervision and problem solving (BankSETA, 2018; Dash, 2018). In addition, it is argued that with the removal of menial and repetitive tasks, employees can turn their attention to more beneficial and higher-value tasks which also have the potential to improve working conditions (Behr, 2016; Dash, 2018; Martino & Schaffner, n.d.; Olanrewaju, 2014). Also, as new products and technologies are introduced a different set of tasks will be required and future opportunities identified, this will generate new jobs or require the upskilling of current jobs that are focused on the areas of automation and information technology (Arntz et al., 2016a; Arntz et al., 2016b; Hamilton, 2018; Jaafar, 2018).

The rise of Fintechs has also peaked the interest of job seekers, who are enticed by what are deemed to be exciting, fashionable and contemporary roles in the financial space. Multiple avenues exist for those who have the desire and capabilities to aspire to such roles. This will require entrepreneurial skills such as problem solving, critical thinking, understanding risk and opportunity identification (COEFS, 2017). Alongside, new occupations and those less at-risk some of these new Fintech occupations are listed in Table 3 below. This list is indicative and provides an initial understanding of the scope and type of occupations that require further exploration in the digital case study (to follow this report). This exercise will inform the mapping of occupations and capabilities required to meet the South African banking sector’s current and future digital requirements.

Table 3: Types of occupations likely to be less at-risk, expand or are new as banks digitally transition

Occupation category	Associated occupations
Data analytics	<ul style="list-style-type: none"> - Data analyst - Data scientist - Data development
Designers	<ul style="list-style-type: none"> - UI/UX designer - Graphics designer - Mixed-reality experience designer - Conversational interface designer
Engineers & mechanics	<ul style="list-style-type: none"> - Product engineer - Software engineer - Digital process engineer - Algorithm mechanic
Information technology	<ul style="list-style-type: none"> - Cloud manager - Security developer - Architecture / infrastructure developer - Network developer - App developer

	<ul style="list-style-type: none"> - Back-end systems developer
Leadership & management	<ul style="list-style-type: none"> - Chief Executive Officer - Company Finance Officer - Chief Operating Officer - Product manager - Fintech mentors - Universal service advisor - Partnership gateway enabler
Sales & marketing	<ul style="list-style-type: none"> - Market analyst - Sales manager - Content writers - Social media specialist - Customer service (complex) - Capital market development specialist - Customer analyst
Education & training	<ul style="list-style-type: none"> - Technical literacy trainer - IT trainer
Financial traders & investors	<ul style="list-style-type: none"> - Cryptocurrency trader - Cryptocurrency advisors
Policy makers & regulation	<ul style="list-style-type: none"> - Policy developers - Lawyers - Compliance officers - Control officers - Money laundering specialist - Regulation advisors / specialist

Sources: (Anon, 2018a; Bagley et al., 2012; BankSETA, 2018; Capco, 2018; CarbÓ-Valverde, 2017; Clausen, 2018; Dash, 2018; González-Páramo, 2017; Hamilton, 2018; Heerden, 2018; Hesse, 2018; Laurens, 2015; Lele, 2018; Lourie, 2017; Martino & Schaffner, n.d.; Pastore et al., 2013; Ramavhona & Mokwena, 2016; Schmidt et al., 2017; Shukla & Rebello, 2017; World Economic Forum, 2015)

The research also suggests that there is a current trend for banks and financial organisations to outsource work to freelancers and independent professionals to reduce costs (Behr, 2016; World Economic Forum, 2015). This both reduces their permanent staff base but offers an opportunity for consultants to fulfil these previously internalised roles (and an opportunity for those who did hold these positions to act as external consultants).

The skills and capabilities required to leverage new or to adjust current occupations will be an imperative area of focus for banks and financial organisations as South Africa becomes more digitalised and services-driven. Digital and technical skills will need to be fostered in order to support the transitioning of low-skilled jobs to high-skilled more technical-orientated jobs (Meads, 2017). Workers will either need to re-educate themselves or employers will need to provide opportunities and training to upskill their workforce – especially if they are to mitigate employee dissention. Initiatives such as Standard Bank’s Digital Skills Academy is illustrative of this. This need for improved skills not only lies in tertiary and/or lifelong learning, but critically at the school level, where South Africa’s primary and secondary school education is weak, and technical and vocational colleges are too small and their curricula dated (Tshabalala, 2017).

Emergent themes

“Ultimately human beings are creatures that seek connection. Robots in a store will never compare to walking in a grocery store and you get asked about your graduation.” (Mpupuni, 2019).

The purpose of this section is to reflect on the emergent themes and occupations that transpired from a series of interviews undertaken with representatives of the South African banking sector in relation to jobs and skills for the sector's digitalisation needs. 18 organisations within the sector were approached for interviews, with Absa, the Finance Union (Sasbo), Investec, the South African Reserve Bank and Standard Bank responding positively to the request. Given the focus of this study on digitalisation in the banking sector and just transitions, interview questions sought to capture this focus (see Appendix 1). Insights gathered from interviews were drawn on to inform this document and recommendations to BankSETA.

The following section draws out the key themes that emerged from the interviews in relation to jobs and skills associated with the digitalisation of the South African banking sector. These are discussed in more detail below (including proposed considerations and/or recommendations), and cover:

- Job losses vs Emergent new jobs and competencies
- Increased emotional intelligence / human-centred requirement
- Organisational flexibility, agility and circularity
- South Africa's ability to meet the sector's occupation and competency demands
- Transformation, inequality and polarisation
- It's here, it's coming – let's be proactive together

Job losses vs Emergent new jobs and competencies

All respondents noted that with the exponential growth of digitalisation in the South African banking sector, there'll be both job losses and new jobs created, with all, including the banking union Sasbo, drawing attention to job creation potential (Boninelli, 2019; Ismail, 2019; Monyatsi, 2019; Tager & Brand, 2019; Venter & Kokela, 2019). The supporting information gathered in the preceding literature review also highlighted this discourse, however literature does focus more strongly on potential job losses (from a global perspective) with the nuanced debate around actual number of losses – from significant to conservative suggestions that it will be more skills that are 'lost' (no longer required) rather than actual jobs. In response to this statement Ismail (2019), Head of the Fintech Unit at the South African Reserve Bank, notes:

“There are likely to be job losses [due to digitalisation of the sector] and new sets of jobs. It is not doom and gloom. Robots won't take over.”

When the issue was raised the Financial Sector Union – Sasbo, they noted that when they have tried to engage with the banks on this matter, there has been little response (Venter & Kokela, 2019). This may suggest that while the topic was not highlighted as an area of major concern in the interviews, job losses are recognised but banks are reluctant to communicate the detail. Given this lack of engagement, and Sasbo's desire to better understand the potential impact of digitalisation on the South African banking sector, they embarked on an international fact-finding mission, which provided numerous insights to inform how they will approach and engage with banks on this topic (see further discussion below).

In terms of the potential occupations that may become redundant or have reduced demand, tellers, bankers, accountants and insurers, and those involved in more administrative, back-office processing and front-line (e.g. branch hosts) roles, were suggested by respondents (Ismail, 2019; Tager & Brand, 2019; Venter & Kokela, 2019). Bank managers of the future are more likely to transition to relationship managers using forms of technology such as Skype and video calling on

WhatsApp to communicate and connect with customers within a wider service-offering ecosystem (Monyatsi, 2019; Mpupuni, 2019; Venter & Kokela, 2019).

Respondents supported the literature that suggests skills and competencies are more likely to change, with specific **skills and competencies** becoming more relevant, with increased digitalisation. The types of skills and competencies highlighted by respondents as current and/or future demands for the digitalisation of the sector include:

- **Problem solving** – was deemed the most prominent skill required by those working in digital banking, and includes complex problem solving, being able to sift through and listen to ‘noise’ and filter out the permanent information (Boninelli, 2019; Ismail, 2019; Monyatsi, 2019). Within this element, it was suggested that the need to draw on individuals with deep experience was critical for identifying and working through problems. A depth of knowledge of the sector was considered more relevant than codified knowledge in these circumstances. Whilst it was acknowledged that experience carried significance in such situations, younger technical employees were argued to also contribute towards problem solving as they are more ‘digitally current’ (Mpupuni, 2019).
- **Creativity, ingenuity, critical thinking and aptitude** – these are linked to both visual product development and problem solving, which is a continuous process (Ismail, 2019; Tager & Brand, 2019; Venter & Kokela, 2019).
- **Emotional intelligence** – most respondents highlighted that emotional intelligence is and will increasingly become a critical requirement for those operating in the digital space. Whilst this may appear to be ironic given the digital products disconnect the user from the bank, all suggested that this disconnection would result in a greater human- / customer-centric approach. Thus the call for bringing sociologists, anthropologists and psychologists into the fold who would bring a sense of empathy and understanding of user behaviour into product development and implementation (Ismail, 2019; Monyatsi, 2019; Venter & Kokela, 2019) (see section on these occupations below).
- **Team collaboration** – the ability to collaborate in a team, associated with enhanced requirements for emotional intelligence and communication competencies, was suggested as an increasing need of employees operating in the digital space. This even applies to those with ‘hard’-technical occupations and competencies, who are becoming integrated into product development teams that require collaboration amongst its members (Boninelli, 2019; Ismail, 2019).
- **Co-ordination and boundary spanning** – given the importance of teams and collaboration, and the speed of development, implementation and refinement of product and systems the need for individuals to effectively and efficiently co-ordinate activities and people, and knowing who to call on, is critical. One such occupation, is that of the Product Manager (see description in the occupations table in the section below). The role of such an individual, and those that carry co-ordination-type tasks, is one of boundary spanning – the ability to translate ‘technical speak’ to ‘design’ or ‘client/business’ speak (Boninelli, 2019; Ismail, 2019; Venter & Kokela, 2019).

Sasbo (Venter & Kokela, 2019), noted that with increased digitalisation, the demand for individuals to be multi-skilled is more likely, and suggested that this brings a level of precariousness to the future of work in this area i.e. people are less easily classified or labelled as experts or specialists. They forewarned that the industry must therefore not ‘abuse the multi-skilled’, particularly when it comes to pay.

Organisational flexibility, agility and circularity

What became evident during the discussions was the speed at which decisions are made, responses are received, and products developed and refined - quick turnaround times, flexibility of organisational structures and protocols and agility of individuals and teams to respond to internal and external user and client needs. The term 'trading in flight' aptly captures this and will become more so as companies demand products and systems to undertake hundreds of thousands of transactions per second (Boninelli, 2019; Ismail, 2019; Tager & Brand, 2019; Venter & Kokela, 2019).

The process of digital product development, implementation, refinement and is not linear (traditional) but more circular – with continual checks, improvements required along the chain of activity and 'taking the user or customer on a journey' (Ismail, 2019; Monyatsi, 2019). Therefore, the need to be flexible and agile during this process is a critical competency required of the product/digital team. Technologies, such as WhatsApp are being used to communicate and expediate decisions. A practice which contradicts traditional banking practices, which often require various levels of sign-off, time and is linear (Boninelli, 2019; Ismail, 2019).

South Africa's ability to meet the sector's occupation and competency demands

The overarching response to whether South Africa has the necessary skills and competency pool to meet the sector's growing digital needs, was that it does not. It was acknowledged that whilst the desire to meet these needs is there, the underlying and important skills and knowledge to transition to a digitally-skilled and competent workforce was not in place, and skills were not being generated quick enough (Boninelli, 2019; Ismail, 2019; Tager & Brand, 2019). Two predominant reasons were given for this:

1. IT skilled individuals being 'poached' to work overseas, and inability to retain skills (Tager & Brand, 2019), and
2. Inadequate, fundamental underlying skills and competencies e.g. aptitude (Ismail, 2019; Tager & Brand, 2019).

With regards to the latter, Ismail (2019) noted that for Fintech start-ups, individuals did not have adequate scaffolding to enable them to succeed within the Fintech space. The type of knowledge and skills he suggested are: *"How to start a micro-micro business? How to be bold enough? How to use technology and filter what is important. How to talk to a customer?"*

In addition to the latter, Tager & Brand (2019) suggested that the lack of incoming relevant skills was down to IT not being adequately recognised as a future career path, with Government not 'pushing it as a career'.

Given the suggested lack of appropriate skills, those interviewed cited how their organisations were implementing opportunities to provide training and upskilling individuals to adapt to and support a digital transition – this includes internal training (formal and 'on the job'), enrolment on one of the Digital Skills Academy's courses (an Irish operation offering digital training in South Africa), attendance on international courses in the States (Boninelli, 2019; Monyatsi, 2019; Tager & Brand, 2019). As can be noted, training is either offered by the institutions themselves, or from or at international providers. This highlights the lack of appropriate digital courses and degrees offered in South Africa to meet the sector's demands (Mpupuni, 2019). Many respondents did however, reference that whilst courses or qualifications are lacking, upskilling of individuals currently within their organisations was a focus, thereby retaining individuals (aka mitigating job losses) and

transitioning them into more digital-centric occupations (Boninelli, 2019; Tager & Brand, 2019; Mpupuni, 2019).

From a human resource perspective it was acknowledged that given the speed of change and new occupations and competencies required (yet ever changing) was proving difficult for HR units or have relatively standardised occupational frameworks and job descriptions and are therefore unsure where to place these individuals, or how to write up job descriptions (Boninelli, 2019; Ismail, 2019) – as illustrated by Boninelli (2019), a digital product manager at Standard Bank who noted that “when I joined there was no job spec, I had to write my own.” A search of current digital current vacancies and the variety of job titles and occupations listed by the finance sector, validates the difficulties HR would be facing.

In terms of skills and competency acquisition, it was suggested that given the necessity, in a problem-solving dominant environment, to draw on deep experience and digital currency, skills acquisition is an overlapping process as ‘old skills’ become less relevant and are replaced with ‘new’ and ‘future’ skills, as illustrated in Figure 1 below. What this model of acquisition suggests and proposed by Ismail (2019) is that the naming of an occupation or job function is no longer important, what is more important within the digital system is value i.e. the value an individual brings to the system. This approach would be pertinent for roles such as UX/UI designers in which few courses are provided and learning on the job is the predominant form of knowledge acquisition (Boninelli, 2019; Tager & Brand, 2019).

Figure 1: Skills and competency acquisition within a banking organisation as it digitally transitions



This transitioning and overlapping of knowledge acquisition and skills transformation can alleviate the tension between the ‘traditional’ versus ‘new’ banking business models, which need to be futuristic and innovative. Monyatsi (2019), Executive Director of Digital Channels at Absa, suggests that such an approach will provide the support leaders realise they need to change in order to survive the shift to a more digitalised model of operation. This level of survival also relates to the individual, with Sasbo suggesting that banks need to identify in this digital space what the passions of their employees are, and how these can be taken into account in their own space in order to retain their skills, yet provide upskilling opportunities (Venter & Kokela, 2019).

Transformation, inequality and polarisation

“The employee question and skills question goes deeper than when employees arrive at organisations. It is embedded within the education system.” (Mpupuni, 2019)

One of the major transformational issues associated with digitalisation in banks, is the lack of black women entering the field. Tager & Brand (2019) noted this as an area of concern for Investec, who are trying to make the IT male-dominant field more attractive to black women, but that this was proving difficult and suggested using activities such as shadowing to introduce women to this sphere of banking.

Aligned with the increasing emergence of Fintechs is the inequality and access to resources available to start-ups to finance, and ability to develop business knowledge and necessary skills and competencies. This exposes start-ups to increased failure, and if they do succeed and begin to scale their individualism and agility is likely to become subsumed and absorbed by one of the major banks or big-tech companies, who see the Fintech solution as one of their many offerings (Ismail, 2019; Venter & Kokela, 2019). This can lead to a form of polarisation with numerous under-resourced/weekly financed small-players vs large-scale monopolies who through buyouts maintain the status quo of dominance in the sector.

In essence, digital Taylorism is the potential of digitalisation to standardise elements of the labour process, which will serve to depress the wages of knowledge workers (Avis, 2009). This is the process whereby what was previously tacit knowledge is codified resulting in a devaluation of the labour of certain groups of knowledge workers. This argument is not new as Braverman (1974) conducted extensive research and argued that there is a tendency for capital to deskill the workforce and degrade work —this over four decades ago. What is however worrying and warrants further investigation (and potentially the formulation and implementation of mitigating policies by government) is whether digitalisation exacerbates and fuels the process described by Braverman. Then, it is not a simple matter of the completely new displacing the old but the way technological innovation overlays and interacts with existing social, economic, political and cultural systems and dynamics. Sometimes it will displace the old but at other times it could contribute to already existing negative and destructive systems and structures.

Engagement with stakeholders has indicated that this process of digital Taylorism is potentially already under way with digitalisation impacting a wide range of occupations where the bulk of the tasks performed are of a routine and administrative nature. It should however be borne in mind that these processes can only go so far and that the workers with the knowledge, skills, creativity and problem-solving capacity that enable companies to outperform their competition are still sought after. It is even possible that not only will this group remain sought after but that demand for them will increase as a result of digitalisation. Some have even argued that there is a global war for talent (Brown, Lauder and Ashton, 2008). In banking in South Africa there are indications that certain critical IT occupations (especially in the digital domain) result in competition amongst banks for talent that takes place between industries on a global scale (Tager & Brand, 2019).

This leads one to consider who will be the winners and who will be the losers of the drive towards greater levels of digitalisation. Based on the extensive (or even exhaustive) and multi-faceted requirements required by business of the new digital workforce only a small proportion of the workforce would be eligible to play a central role in digitalised business.

An example of the potential polarisation as well as Taylorism that can be caused and/or exacerbated by digitalisation is that of Uber which was frequently mentioned as an aspirational model by banks. It is an extremely innovative company that has been described as one of the world's most valuable start-ups (Featherstone, 2018) and it is to a certain extent understandable why it is so widely admired and emulated. It has contributed to the creation of a near revolution in transport and actualised the ideals of the sharing economy. Although there have been reports of gruelling working conditions and a lack of work-life balance, at the company headquarters in San Francisco software engineers earn salaries of approximately \$110,000 per annum (Glass door, 2019). This is in sharp contrast to the average Uber driver in South Africa. According to some accounts they earn approximately R16,000 a month but with expenses averaging R9,000 (vehicle rental, insurance and fuel) that leaves them with only R7,000 a month in actual income (Ritchie, 2018).

Added to the above is the dynamic of what can only be described as extremely unequal educational and labour market outcomes in South Africa. These outcomes are still heavily influenced and determined by race, class and gender. An example of educational outcome disparities along racial lines is that in 2011 only 44 % of black and coloured youth aged 23—24 had attained matric compared to 83 % of Indian youth and 88% of white youth (Spaull, 2015). If the learner from a private school (and they obtain an in-demand STEM degree and possess the requisite suite of “soft skills”) becomes a data architect or UX designer and the disadvantaged learner from a state school (who might or might not complete secondary school) is either chronically unemployed or precariously employed (if they are fortunate) it is far from being indicative of a just transition.

It’s here, it’s coming – let’s be proactive

Sasbo’s response to potential job losses and how they, as representatives of employees within the sector, are responding to digitalisation and job transformation, appeared more accepting of the recognised discourse that some jobs will be lost, with individuals in current ‘at risk’ roles being able to upskill and transition into roles requiring increased digital skills and competencies, and that there is much potential for new jobs to be realised. They specifically highlighted that *“whilst we are 130 years old, we are trying to create a Union of the future. One in which we are still relevant and don’t have to be reactive. Sasbo needs to be proactive”* (Venter & Kokela, 2019).

With respect to being proactive, Sasbo illustrated this by suggesting that they need to work with the banks to understand what types of jobs (and numbers) will be affected by 2020 (for example) and what jobs will remain or be new. How can they, with the banks, support the reskilling and/or upskilling of current employees in the sector so that can operate at the required level? (Venter & Kokela, 2019).

Core occupations, knowledge & competencies

The selection of the occupations highlighted below were informed by interviews within the banking sector; and description, knowledge and competency requirements informed by the interviews and other data sources, such as on-line job portals and insights into specific digital occupations within the banking sector. Whilst there are numerous occupations related to digital banking (see Appendix 2) some core and/or unique occupations were highlighted by interviews as requirements for current and future digital banking needs in South Africa. These include, and are covered in more detail below:

- Product managers (digital)
- User-experience (UX) and/or User-interface (UI) Designer
- Information Technology (IT) Developers e.g. Mobile Application Developers
- Fraud analysts, cryptographers and hackers
- Futurists and Thought Leaders
- Social scientists

Given that many of the core digital banking roles are in a state of change and revision, and likely to reflect the specific needs of each bank, overarching descriptions, knowledge requirements, tasks and competencies are listed. Only tasks, knowledge and tools required by the occupation to function within the digital contribution and/or space within the banking sector are highlighted.

Much detailed information on knowledge and competencies have been gathered predominantly from developed world texts, and therefore do not adequately reflect how the knowledge, tasks and

competencies required of an individual holding such an occupation in South Africa. To acknowledge such competencies and knowledge are critical for the recognition of digital occupations in South Africa, and our unique requirements to operate within this context, for example, the technical literacy variability of users, language, access to and use of smartphones and functionality that is quick and efficient when data access and reception is not always reliable.

Product manager (digital)

A digital banking product manager plays a crucial role within banking digital teams – they are the ‘glue’ that holds together and co-ordinates the activities of a digital team and/or digital banking channel activity. They control the scope of a project and act as the broker between the designers and the ‘technicians’ who develop the backend. Based on the problem that needs to be solved, a problem statement is developed to inform what should be built and the requirements for the product. This requires an understanding of the client and user requirements, scope of the brief (the rules) and internal organisation processes. The product manager engages with the design team (notably UX and visual designers) to develop the design elements of the product, they then engage with the technical team to build the specified product (Boninelli, 2019).

The occupation description provided within the OFO 2017 is very generic and requires a more granular level of description to adequately capture the role of a product development manager within a digital team at a bank.

Occupation name: Product manager			
OFO major group (code)	OFO sub-major group (code)	OFO unit group (code)	OFO occupation code
Managers (1)	Administrative and Commercial Managers (12)	Research and Development Managers (1223)	Product Manager (122303)
Occupation description and purpose:	Plans, organises, directs, controls and coordinates research and development activities within organisations, with a focus on digital banking products to serve customer banking needs.		
Recommendations to adapt the definition to make it relevant for digitalisation in the banking sector:	Field of knowledge:	<ul style="list-style-type: none"> - Compliance with international and national banking and digital legislation - Ability to understand complex business and technical issues - Familiar with entire Software Development Life Cycle e.g. Agile/Scrum methodologies - Various computer programmes e.g. Microsoft Word, Excel and PowerPoint) - Finance or business degree 	
	Tasks:	<ul style="list-style-type: none"> - Planning, directing and coordinating research and development activities, in-house or commissioned from external research organizations, to develop new or improved technical processes, products, knowledge, or utilisation of materials. - Support the management and development of digital banking products - Monitor daily performance of digital banking products 	

		<ul style="list-style-type: none"> - Provide production support including the management and prioritisation of production defects - Work with front-line and customer advocacy staff to ensure that feedback about the product experience is obtained, analysed, and utilised to drive product changes and enhancements - Work with internal training groups to ensure that front line personnel are trained on all aspects of digital products - Updating product demonstrations and user guides, and facilitating training or Q&A sessions - Work on competitive analyses, reporting of product performance metrics, strategy planning and presentations - Participate in the development specifications for future digital banking products, user testing, and conduct focus groups - Advocate for outstanding customer experience - Support digital banking product deployment - User acceptance testing and production validation activities - Vendor and risk management - Co-ordination of marketing activities and schedules
	Competencies	<ul style="list-style-type: none"> - Team player/collaborator, problem solver, creative, strategic and forward thinking, organisation and management skills, PC skills, analytical and research, agile project management, brokering
Specialisms or alternative titles:	<ul style="list-style-type: none"> - Product manager (Digital channels) - Product manager (Consumer electronics) - Product development manager (digital) 	
Occupational network	<ul style="list-style-type: none"> - Head of Digital Channels - Digital experience manager (DX manager) - UX and Visual designers - iOS, Android and HTML technicians - Backend developers - Testers - External clients 	

Sources: (Boninelli, 2019; DHET, 2017; Indeed, 2019).

User-experience (UX) and/or User-interface (UI) Designer

The UX/UI Designer is an emergent and new role in the digital banking arena. It did not exist in the main a few years ago yet is becoming a much needed and highly-sought after position within the banking sector (Boninelli, 2019; Monyatsi, 2019). It is a multi-disciplinary field, with designers coming from a variety of backgrounds such as visual design, programming, psychology and interaction design. The user is central to the work of the UX/UI designer, with the process of product development being iterative that takes the understanding of the users and their context as a starting point for all design and development (Interaction Design Foundation, 2019).

The description, knowledge and competency requirements are dynamic, due to the newness of the occupation, and refinement as the position becomes more recognised and/or defined. This is an implication for Human Resources, and the OFO, which either have more static job descriptions or titles which cannot mirror the changing nature of the occupation.

The OFO does not recognise 'UX/UI Designer' as a specific occupation, however similar occupations may be Multimedia Designer (216603), Digital Media Designer (216603) and Web Designer (216604). However, the role, knowledge and competencies required of a UX/UI Designer are significantly different to warrant a specialism within the OFO. This could be twinned with the occupation UI Designer, as is often the practice within the digital (banking) sector.

Occupation name: UX/UI Designer			
OFO major group (code)	OFO sub-major group (code)	OFO unit group (code)	OFO occupation code (similar to, but not the same)
Physical, Mathematical and Engineering Science Professionals (21)	Architects, Planners, Surveyors and Designers (216)	Graphic and Multimedia Designers (2166)	Multimedia Designer (216603) Digital Media Designer (216603) Interactive Media Designer (216603) Web Designer (216604)
Occupation description and purpose:	To create digital financial service products that provide meaningful and relevant experiences to users and match their needs with banking capabilities. This involves the design of the entire process of acquiring and integrating the product, including aspects of branding, design, usability and function.		
Recommendations to adapt the definition to make it relevant for digitalisation in the banking sector:	Field of knowledge:	<ul style="list-style-type: none"> - Branding and graphic design - Software design and prototyping - Design terminology - Human/user-centred design methodologies - Understanding of standardised user conventions e.g. drop-down menus, toggles - UI trends, techniques and technology 	
	Tasks:	<ul style="list-style-type: none"> - To think through a user's full journey of a digital product (incl. trouble-shooting) - Understand context of use - User research, creating personas - User requirement specifications - Design concepts, storyboards, user and process flows, site maps and solutions (wireframes and interactive prototypes) - Evaluate product against requirements - Design testing 	
	Competencies	<ul style="list-style-type: none"> - Ability to understand, determine and plan a user's journey when using a product - Ability to work within a cross-functional team - Agile/scrum development cycle processes - Adobe Creative Suite (or similar) - Creative thinking, research, iterative problem solving, emotional intelligence, interpersonal, written and communication skills 	

Specialisms or alternative titles:	<ul style="list-style-type: none"> - Graphical User Interface (UI) Designer - User Experience (UX) Designer - UX Architect
Occupational network	<ul style="list-style-type: none"> - Product manager (Digital) (122303) - Visual designers - iOS, Android and HTML technicians - Software Tester (251901)

Sources: (Boninelli, 2019; HAYS, 2019; Interaction Design Foundation, 2019; Kreger, 2019; UOB, 2019)

Within the broader design occupation category, a core occupation is **Visual Designer** (also referred to as a **Digital Banking Officer (Visual Design)**). A Visual Designer is likely to be part of the digital product development team, working with UX/UI Designers. The role of the Visual Designer is to develop the design, layout and style (colour, font, images) for various product interfaces such as websites, mobile devices and apps. Whilst a Visual Designer would be expected to demonstrate strong visual design skills and experience, within the banking sector they require an understanding of e-financial products and preferably have experience working on digital banking projects (Bank of China, 2019). The occupation Visual Designer is not specifically referenced as an occupation or specialism in the OFO – similar, yet different, occupations include: Advertising Artist/Designer (216601), Digital Media Designer (216603) and Web Designer (251302).

Information Technology (IT) Developers

A core group of occupations associated with transitioning to a digital future are the developers. Their roles and occupation titles vary, however key occupations (or similar) required for the banking sector, and within wider digital teams, are Mobile Application Developers, HTML Developers, JavaScript Developers, Software Engineers (Backend) and Testers. Individuals holding these roles build the product to the specifications of those developed in consultation with and/or by the product manager and UX/UI and visual designers. They build the system, functions, rules and test the product.

With the rise of smartphones and tablets, **Mobile Application (app) Developers** are in high demand, with this demand set to increase with a predicted 2 billion mobile banking app users by 2020 (Doyle, 2018; ITCareerFinder, 2019).

Whilst being self-taught many do have a background in computer science, either obtained through short-courses through to Masters or PhD level (Doyle, 2018). As with the previous occupations, both hard technical and more human, emotional skills are required.

It is common practice, for mobile app developers to be contracted in to develop apps, particularly for start-ups, such as Fintechs. However, for large banks, they can form part of an internal digital team.

Occupation name: Mobile application developers			
OFO major group (code)	OFO sub-major group (code)	OFO unit group (code)	OFO occupation code (similar to, but not the same)
Professionals (2)	Information and Communications	Software Developers (2512)	Applications Developer (251203)

	Technology Professionals (25)		
Occupation description and purpose:	To create, build, test and implement applications for mobile devices.		
Recommendations to adapt the definition to make it relevant for digitalisation in the banking sector:	Field of knowledge:	<ul style="list-style-type: none"> - Various programming languages e.g Objective C, C++, C# or Java programming languages - Know the terminology, concepts, and best practices for coding mobile applications - Bachelor's degree in software engineering, mobile application development, mobile computing, computer science or a similar programming-centric field of study 	
	Tasks:	<ul style="list-style-type: none"> - Analysis of user needs to create apps for user use - Analysis of how people use mobile devices - Create Android and iOS apps based on UX/UI requirements and mock-ups - Code, test, debug, monitor and document changes for mobile applications - Implement application programming interfaces (APIs) to support mobile functionality - Recommend changes and enhancements to existing mobile applications 	
	Competencies	<ul style="list-style-type: none"> - Technical (e.g. coding) and analytical skills - Skilled at working inside the development environments of one or more the top mobile OSes - Communication and writing skills - Creativity, critical thinking and problem solving - Attention to detail - Ability to explain technical terminology to non-technical team members, clients etc - Understanding of various technical problems and how to resolve them - Cross-platform development 	
Occupational network	<ul style="list-style-type: none"> - Product manager (Digital) - UX/UI and visual designers - Software Tester (251901) - Clients e.g. Fintechs 		

Sources: (Boninelli, 2019; Doyle, 2018; ITCareerFinder, 2019)

Other IT digital banking occupations:

Many other IT occupations are required to support digital banking activities and products, with many being relatively generic and/or are relatively well-established within the IT sector. As such, they are not covered here in detail, however those that were highlighted by respondents included: **HTML Coder/Developers (251302)**, **JavaScript Developers and Software Engineers (Frontend/Backend) (251201)**. Having reviewed a number of job applications for these occupations within the banking sector, what distinguishes these occupations from the generic is an ideal requirement for having experience of working in a banking environment (e.g. (Crealogix Group, 2019; D3 Banking Technology, 2017)). Otherwise, other skills and knowledge required for Software Engineers could be deemed generic.

Fraud analysts and cryptographers

With digital banking crimes on the rise, the role of individuals within the banking sector to assess security risks (Holburn, 2018), potential for fraudulent activities and to deal with security breaches will also be in much demand (Tager & Brand, 2019). This includes setting up access and user protocols and mechanisms to detect fraudulent activity, setting up and defining new legislation to keep abreast with the fast-changing landscape, and protecting both the banks, their clients and customers. A relatively common occupation within digital retail banking is that of the **Fraud analyst**¹. Fraud analysts analyse and research online fraud patterns, particularly online banking to help protect banks against account takeover and fraudulent transactions. Setting of rules and development of programmes to detect real-time fraud. Knowledge and experience in analysing large amounts of data is required, with strong analytical and problem-solving skills. Similar and/or related occupations include Fraud Strategy Analyst, Fraud Prevention Analyst, Fraud Operations Analyst (FIS Global, 2019; IBM Security Services, 2019; Varo Money, 2019).

Another critical, core and much in demand occupation within this network of occupations is the **Cryptographer** (often grouped with Mathematicians)(Monyatsi, 2019). Cryptographers provide the vital role of securing data in transit and at rest, protecting personal information and communications, and ensure the integrity of every online purchase. As banks increase their digital portfolio, the reliance on technology will create an ever growing need for cryptographers, both internally and externally (Sully, 2016). A detailed overview of this occupation is presented below.

Occupation name: Cryptographer			
OFO major group (code)	OFO sub-major group (code)	OFO unit group (code)	OFO occupation code (similar to, but not the same)
			No OFO code, with no similar occupation codes identified
Occupation description and purpose:	To develop algorithms, ciphers and security systems to encrypt sensitive information. To analyse and decrypt hidden information (e.g. encrypted data, cipher texts, telecommunications protocols) in cryptographic security systems to ensure that private data regarding finance is hidden from 'cyber-terrorists'.		
Recommendations to adapt the definition to make it relevant for digitalisation in the banking sector:	Field of knowledge:	- Mathematics, Computer Science, Computer Engineering or related degree	
	Tasks:	<ul style="list-style-type: none"> - Protect important information from interception, copying, modification and/or deletion - Evaluate, analyse and target weaknesses in cryptographic security systems and algorithms - Design robust security systems to prevent vulnerabilities - Develop statistical and mathematical models to analyse data and solve security problems - Test computational models for reliability and accuracy 	

¹ Fraud Analysts are widely advertised; however, they are not specifically recognised within the OFO, with similar but not the same occupations listed: Serious Fraud Investigator (335201) and Fraud Examiner (242215).

		<ul style="list-style-type: none"> - Investigate, research and test new cryptology theories and applications - Probe for weaknesses in communication lines (e.g. wireless network, secure telephone, mobile phones, email, etc.) - Ensure financial data (e.g. credit card, inter-bank, ATM, online transactions, etc.) are securely encrypted and accessible only to authorized users - Ensure message transmission data (e.g. wireless network, secure telephone, mobile phones, email, etc.) are not illegally accessed or altered in transit - Decode cryptic messages and coding systems for military, political and/or law enforcement agencies - Develop and update methods for efficient handling of cryptic processes - Provide technical support to government, businesses and industry to solve security-related issues - Advise colleagues and research staff on cryptical/ mathematical methods and applications
	Competencies	<ul style="list-style-type: none"> - Computer architecture, data structures and algorithms - Linear/matrix algebra and/or discrete mathematics - Probability theory, information theory, complexity theory and number theory - C, C++, Python, Java and similar programming languages - Principles of symmetric cryptography (e.g. symmetric encryption, hash functions, message authentication codes (MAC), etc.) - Principles of asymmetric cryptography (asymmetric encryption, key exchange, digital signatures, etc.) - Creative, problem solving, trustworthy, good judgement
Specialisms or alternative titles:	<ul style="list-style-type: none"> - Cryptanalyst - Signals Analyst - Message Decoder - Data Decoder - Encryption Expert 	
Occupational network	<ul style="list-style-type: none"> - Digital Channel leads - Product manager (Digital) - Software Tester - Security and financial consultants 	

Sources: (Cyber Degrees, 2019; Study.com, 2019)

Within the cybersecurity category of occupations are **Hackers**. Aside from those that may be deemed 'digital terrorists' and hack accounts and banking systems, Hackers are much sort after by the sector. They are employed to proof test their systems, programmes and digital products.

Hackers can be identified through ethical hacking competitions, coding events which demonstrate new technology or through collaborations with Universities to identify new recruits (Felicetti, 2019; Monyatsi, 2019).

Futurists and thought leaders

The role of the futurist is no longer preserve of Sci-Fi movies. They are increasingly being called on by banks to present and discover a vision and argument for a preferred or potential future. They come from a variety of backgrounds, including future-minded authors, speakers, film-makers, art designers and philosophers, and bring their unique expertise and perceptions to a discussion on the impact of technologies and the dilemmas future banks will face (Leonhard, 2019; Monyatsi, 2019).

With the rise of Fintechs, artificial intelligence and automation Futurists, alongside **Thought Leaders**, will continue to be in high demand. They draw on their expertise and experience to determine the reality, trends and impact on the future of banking (Monyatsi, 2019; PwC, 2018; Thinqe, 2015). Futurists and Thought Leaders are likely to operate as independents or are likely to be employed by, for example, one of the 'big four' (PwC, EY, KPMG, MacKinsey) as specialists.

It is suggested (Hiemstra, 2000), that Futurists follow three career paths:

- 1) They professionals from a variety of fields who have an interest in the future and take on an 'informal' learning path and are self-taught through reading literature, undertake forecasting, investigate science and technology, organisation and system change. They attend conferences and seminars and begin to define themselves as futurists.
- 2) Through traditional education institutions and reading undergraduate or graduate degree programs on future studies. This route is often interdisciplinary.
- 3) Through mentoring, being guided and mentored by a Futurist who recommends material to read and events to attend.

From the perspective of banks, Futurists and Thought Leaders can provide a sense of the risks or where a bank should be focusing its product and security efforts. From the perspective of Just Transitions, these occupations are just as relevant – in particular the 'future of work' and predication on job losses or opportunities linked to digitalisation (Byhovskaya, 2017). They can nuance the discussion and assessment, and as highlighted by Sasbo, ensure the sector proactively harnesses the potential of digitalisation and how the sector can ready its work force through upskilling as the sector transitions with the exponential growth of digitalisation.

Social scientists

The irony of an exponential growth in digital products, is the need to have a greater understanding of the behaviours, cultural-backgrounds, emotions, feelings, situations, needs and desires of the users (Skara, 2018). As such, all interview respondents noting that emotional intelligence and the human-centred approach to digital product design being key, the 'return' of social scientists and waning occupations, such as Psychologists will be in much demand by banks (Monyatsi, 2019).

In addition to understanding the psychological traits of users, users are generally not proficient at dealing with their finances, and can develop negative emotions towards financial activities, such as stress. According to a survey by PwC (2017), it is millennials (the highest users of digital products) that suffer the most stress about their finances. Therefore, the role of social scientists such as **sociologists (263204) and anthropologists (263201)** (group behaviour and culture) and

psychologists² (individual behaviour) are key to aiding users to have a more positive experience and response to using digital products; and therefore, informing user-, designer- and programme-guidance to support and alleviate the users potential stresses (Marous, 2018; Monyatsi, 2019; Skara, 2018).

Similar human-centred roles within this category of occupations include the ‘traditional’ **bank (134601)** and/or **business managers and advisors, receptionists and tellers (421101)** who may transition to digital-relevant customer-facing roles or become community managers situated within communities. People will still be wanting a personalised service, both digitally and in person, and to be made to feel special and unique. As such, these roles will remain but will certainly change, with individuals still required to answer complex questions about products, problem-solve if issues arise with products or provide guidance on product suitability (Marous, 2018; Monyatsi, 2019; Phillips, 2019). A teller or branch receptionist for example, may no longer be stationed in a bank, but may transition to becoming an agent in a call-centre identifying user and customer requirements and concerns, and filtering who, where or what the best support or advice may be provided. In a country such as South Africa, these human-centred roles will be critical to aid those who are new to digital banking, those who’re fearful of digital banking or financing, elderly or technically and/or illiterate.

Conclusion

Whilst South Africa is suggested to be about 3 years behind the international curve for digital adoption, digitalisation of the banking sector is no longer the preserve of the future it is happening now and has been doing so since the advent of the computer and introduction of ATMs. The transition is happening rapidly and opening the space for a wide variety of service providers. This speed is challenging for large-scale legacy banks and regulations and government policy are having to play catch up. Should our smartphone and internet access penetration infrastructure improve and ownership increase – as it is likely to do – the growth of digital banking and shift away from traditional cash-centric banking will change, and rapidly. This will have an impact on more menial and repetitive tasks, such as tellers, auditing, provision of customer information and data analytics. However, it also opens a space for the creation of new jobs, and more specifically opportunities for current employee upskilling. Human face-to-face interaction, management, creative, technical and digital skills will be in much demand and unlikely to be fully automated. The banking sector is beginning to recognise and respond to this change but should do more to proactively identify jobs most at risk and how the individuals within these positions could be upskilled to improve their job security within the sector i.e. learning to work with new technology or developing skills to transition into some of the new jobs that advanced digitalisation will require. Banks should invest heavily in staff training to expose them to the digital world and provide first-hand experience of what can be achieved.

However, the country and the sector sit with a major problem – especially if it demands a more skilled and educated workforce for the digital age – and that is the poor quality of our education system – in particular maths, science and technology. With only 37% of youth entering school gaining a matric pass (Marchesi, 2018), this does not bode well for an industry that needs to attract a digitally capable and literate youth as future employees.

² Various psychologists could be deployed in digital banking, notably Clinical Psychologist (263401), Organisational Psychologist (263403), Research Psychologist (263405) and Community Psychologist (263408).

Given the speed at which the sector is transitioning to digitalisation, which is being reflected in non-standardised and 'new' occupations, it is recommended that BankSETA reviews the current OFO framework and identifies corresponding occupations listed with the emerging job titles. Having undertaken a similar streamlined exercise for this study, it is evident that, aside from traditional occupations, many of the 'new' occupations are not adequately recognised within the OFO. This exercise would also include a list of associated tasks for these occupations, which will aid HR with writing up job descriptions. For a list of example digital banking occupations identified for such an exercise, see Appendix 2.

Given the focus on the tacit acquisition of skills and competencies, the relevance of work-based learning should be a focus for BankSETA to support banks to meet their digital skills demands. This may be in the form of supporting mentorships and shadowing.

BankSETA could provide the platform to inform individuals of the numerous opportunities available within digital banking and provide the guidance and support for those wishing to enter this area as a career.

With regards to training and given the lack of relevant and appropriate courses or qualifications offered in South Africa, it was suggested that a full B.Sc. in Information Technology (IT) specialising in digitalisation would be much in demand. Year 1 could provide a general overview, and in Years 2-3 students could specialise in digital product management, software development or user-experience/visual design (Boninelli, 2019).

In terms of Fintechs and start-ups, BankSETA could enhance their role in providing basic business management and customer service skills to open this space to unlock jobs and provide a platform for new entrants to have a better chance of success and sustainability.

An area that requires further research and discussion is the qualitative impact of digitalisation on occupations — specifically the negative externalities that could and already have arisen due to increased digitalisation. Two aspects require further discussion: the potential for increased digitalisation to contribute to already high levels of inequality through more pronounced polarisation of jobs and the threat of digital Taylorism. Although two distinct phenomena, the two are interrelated and interconnected. Discussion papers addressing these matters in more detail will be produced.

What potential is there then for digitalisation to contribute to transformation or alternately to contribute to the perpetuation of inequality, injustice and exclusion? Clearly digitalisation holds the promise of freeing up time for more creative work, higher order tasks or leisure. It also holds the promise of increased levels of exploitation and exclusion. A strong utopian orientation is just as problematic as a dystopian framing, as both are equally ungrounded and sound empirical research. Neither is a neutral position or an optimism that is dismissive of the harsh socio-economic reality of South Africa adequate. What is required is a systemic engagement with the impact of digitalisation in all its complexity as it interacts with an economy and society that is deeply unequal.

As it was not part of this study to provide a detailed audit of the type and number of potential jobs that could be affected by digitalisation in the sector, it is therefore recommended that BankSETA work with Sasbo to better understand the affected occupations in order to develop an upskilling and training/education strategy to mitigate job losses in the sector, and provide potential improved transitions to higher-skilled opportunities.

A detailed overview of key findings, recommendations and policy implications is provided in the following section. As noted, several the recommendations involve BankSETA's collaboration with a

broader stakeholder community in order to best mitigate any issues, and/or enhance the delivery of solutions to ensure a best fit and uptake by the banking sector.

In conclusion, digitalisation of the banking sector has much potential, with the opportunity to create exciting new jobs, the upskilling for those currently in the sector's employ or democratising the sector by providing facilities for the unbanked or job creating through Fintechs. However, there is a word of caution – some jobs will be lost and it will be important to accurately identify these and mitigate the impact in a timely manner; women need to be encouraged to take up digital jobs; and from a customer perspective issues of poor telecommunication infrastructure and technical and banking illiteracy need to be accommodated, and where necessary assistance provided by BankSETA and the sector.

Developing competencies for a just transition of the South African banking sector: Digitalisation

KEY FINDINGS AND RECOMMENDATIONS

Key findings	Recommendation	Potential policy implications
<p>The South African banking sector has embraced and embedded digital mechanisms.</p>	<p>Ensure that as digitalisation is one of BankSETA's five strategic priorities, the findings of this study are used to inform BankSETA's strategic direction and decision-making and to support the banking sector to revisit their business models, with a particular lens on education and training to aid the transition.</p>	
<p>Digitalisation will have both a negative and positive impact on jobs and required skills. This covers both redundant tasks and occupations, with many suggesting that it will be the actual tasks that will be 'disrupted' and not necessarily actual job numbers. Those most effected will be those holding more menial or low-skilled jobs, and those that can be digitalised including administration, bookkeeping, accounting, auditors, data entry and customer service.</p>	<p>To work closely with Sasbo, and BankSETA members to identify in more detail the specific jobs most at risk – when are these likely to become defunct (time period), and identify feasibility of transitioning or upskilling these individuals to continue to be employed within the sector.</p> <p>As jobs are most likely to become more precarious, BankSETA should consider how to ensure individuals working in the sector have a core set of digitalisation skills that will enable them to switch from project to project, or from function to function.</p>	<p>Policy to acknowledge that there'll be both job/skills losses, and opportunities for upskilling and/or new jobs. Policy should address how it will accommodate both, and not just focus on one or the other.</p> <p>Policy to recognise that the nature of work will change i.e. from jobs for life, to project-focused work.</p> <p>To better inform policy through evidence-based research, it is recommended that the quantitative impact of digitalisation on occupations is determined, alongside qualitative multiple-criteria – such as investment in upskilling, retention of jobs etc.</p>
<p>New and/or revised occupations and skills will be required for an advanced digital banking sector. It is recognised that there will be and is a digital skills shortage. Such skills include: creativity, problem solving, maths and science, big data analysis, coding and programming, cloud-based solutions, next generation infrastructure and mobile applications.</p>	<p>Upskilling – technical and non-technical skills to fulfill these new skills requirements (where feasible). BankSETA could support and/or guide this process.</p> <p>Recommendation to provide work-place-based upskilling opportunities (building on internal training already offered by banks).</p> <p>Recommend BankSETA work with DHET to establish/support a BSc in Information Technology, specialising in digitalisation (incl. specialisms in digital</p>	<p>Policy to acknowledge skills other than technical skills, such as creativity, problem solving, critical thinking and leadership when setting out future skills needs for the banking sector, in relation to digitalisation.</p> <p>Policy to recognise and propose a focus on upskilling current employees (see above).</p> <p>Policy to support the development of appropriate and accredited digital short-courses; and support for a new suitable digitalisation tertiary degree.</p>

	<p>product management, software development or user-experience/visual design.</p> <p>Recommendation to provide HR departments with occupationally-directed guidance and support to inform job descriptions, work-sector plans etc to accurately accommodate digitalisation needs.</p> <p>Recommend working with DUT Digitalisation Chair to review the OFO framework and identify corresponding occupations listed with emerging digital job titles. If not a new occupation, to ensure current skills in the OFO adequately accommodate digitalisation.</p>	
<p>Unlocking of jobs through the creation of digital financial start-ups.</p> <p>Fintech growth in South Africa is expected to be rapid, with South Africa third behind China and India in terms of Fintech growth globally. This growth could be expediated if the regulatory environment was less prohibitive, and policy more supportive.</p>	<p>It is recommended that BankSETA considers providing business, banking and financial management advice and training for Fintech start-ups to ensure that can overcome the initial challenges of setting up a business in the sector and ultimately becoming financially sustainable – thereby creating more opportunities for job creation. This could be done in collaboration with the Fintech hubs in Cape Town and Johannesburg.</p> <p>BankSETA to work with other key stakeholders, such as SARB, to provide clarity and guidance on how the existing financial regulations apply to Fintech businesses, thereby assisting new start-ups to navigate their way through the regulatory space and reduce risk.</p>	<p>Ensure policy is not contradictory and hinders start-up set-up and stability.</p>
<p>Lack of women recruits holding digital jobs within the sector.</p> <p>It was noted that this tends to be dominated by males, given it's perceived technical-focus, and therefore historically not considered by, in particular, black women.</p>	<p>BankSETA to run a series of campaigns/career guidance to encourage young [black] women to enter the banking sector, with a focus on digital jobs</p>	<p>To ensure digitalisation of the banking sector is a just transition, policy needs to recognise the inclusion of women.</p>
<p>Digitalisation has the opportunity to provide banking access to the 'unbanked' and rural households.</p>	<p>It is suggested that the role for BankSETA in this context is to provide banking and technical literacy</p>	<p>Policy should recognised the diversity of the banking sector in relation to digitalisation – customers are not a homogenous</p>

<p>It has the potential to democratise access to data, enhance informed financial decision-making and support rural economies, thereby making the financial system more inclusive.</p>	<p>skills support to the previously unbanked to ensure new users are adequately capacitated to manage their finances.</p>	<p>group. Policy should acknowledge and provide support on how best the previously unbanked can benefit from digital banking, yet protect clients from poor financial decision-making.</p> <p>Indirect policy on telecommunication infrastructure, energy supply and cost of data need to be acknowledged as prohibitors to digital advancement in this country. Policy should identify how best to unlock this potential, as opposed to hinder it (albeit through Government interventions).</p>
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Appendix 1: Guiding interview questions

1. How ready do you think the South African banking sector is for increased digitalisation?
2. Do you think South Africa could become completely cashless?
3. How ready is your organisation for the digital 'revolution'?
4. If you have started to transition, where have you invested most of your efforts?
5. What digital banking channels or mechanisms do you provide?
6. What do you think the benefits of digital banking are?
7. What do you think some of the main barriers to digital transformation are in the banking sector?
8. Do you think digitalisation in the banking sector will widen the inequality gap in South Africa?
9. Who do you think will be the main drivers for enhanced digital banking?
10. Fintechs are on the rise in South Africa. Where do you think they're most likely to prosper?
11. Do you see digitalisation in the banking sector as a positive or negative impact on jobs?
12. With regards to digitalisation and jobs, which do you think is most likely? Significant job losses, few job losses, but upskilling of current employees required, an opportunity to create new jobs.
13. How many jobs do you think will be lost in the South African banking sector through digitalisation?
14. What jobs do you think are most likely to become redundant with increased digitalisation in the banking sector?
15. Which activities do you think are most likely to transition to digital?
16. What job categories do you think will be created or become more in demand with increased digitalisation?
17. What additional or new skills are most likely to be needed with increased digitalisation?
18. With increased digitalisation, do you think the banking sector is more likely to outsource work to freelancers / independent professionals?
19. Given the state of our current basic education system, do you think South Africa will be able to meet the future skills and jobs needs for an advanced digital banking sector?
20. Does your organisation provide any upskilling or training to ready employees for the transition to digitalisation?

Appendix 2: List of occupations associated with digital banking

The following list provides an indication of the variety of more recognised and emerging occupations acknowledged by and being recruited by both the South African and International banking sector to serve their digital requirements.

Anthropologist	Financial Crime Controls, Surveillance & Investigations Officer
Auditor (External)	Financial Technology Platforms Specialist
Bank Manager	Fraud (Strategy / Prevention / Operations) Analyst
Branch Manager (Digital)	Fraud Detector
Business (Systems) Analyst (Digital Banking)	Futurist
Business Development Transaction Monitor	HTML Coder / Developer
C++ Developer	ICT Systems Analyst
Call Centre Agent	iOS Developer
Cloud Service Operations Manager	IT Helpdesk Administrator
Cloud Solution Architect	Java Architect/Developer (Backend / Frontend)
Compliance Analyst	Market Risk Analyst
Contact (Call) Centre Agent	Message Decoder
Cryptanalyst	Mobile (Application) Developer
Cryptographer	Online data analyst
Cybersecurity Regulator & Audit Co-ordinator	Payments Technology Product Manager (Mobile)
Cybersecurity Risk Assessor	Pre-sales Consultant (Digital)
Data architect	Process Accountant
Data Science Analyst	Process Engineer (Digital)
Digital (Product) Analyst	Product Manager (Digital)
Digital Banking (Sales) Manager	Product owner
Digital Banking Data Architect	Programme / Project Manager (Digital / Design)
Digital Banking Product Services Manager	Psychologist
Digital Banking Relationship Manager	Quality Assurance Engineer
Digital Banking Specialist	Quantitative Risk Specialist
Digital Channel Consultant	Real Time Monitor
Digital Channel Manager	Relationship Manager (Digital)
Digital Customer Support Specialist	Senior Product Analyst (Digital Banking)
Digital innovation expert	Signals Analyst
Digital Marketer	Sociologist
Digital Product Analyst	Software Architect
Digital Product Consultant	Software Engineer (Backend / Testing/ Frontend)
Digital Sales Manager	Software QA Automation Tester
Digital Solutions Architect	Software Tester
Digital Strategist	Solution Architect (Digital)
Digital Text Analyst	Technical Product Manager (Data Platforms)
Electronic Services Supervisor	UI Designer (Developer)
Encryption Expert	UX Designer (Developer)
Engineering Coach	Verification / Authentication Analyst
	Visual Designer (Digital Banking Officer)

Sources: (e.g. Careers Junction, efinancialcareers, Glassdoor, Indeed.com, LinkedIn)

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