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Adoption of Automation as a Determinant of the Physical Footprint in the South African Banking Institutions

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Abstract

South African banking institutions are transitioning from the conventional banking operating system to a more automated and digitalised one. Banking institutions compete against one another to take control of the market share available in the banking industry. The adoption of automated and digitalised-driven practices has become the norm for banking institutions to serve more customers with fewer resources. The Covid-19 pandemic significantly accelerated the rate of adopting automation through digitisation and digitalisation. This paper aims to understand whether the adoption of bank automation is coupled with the trend of the banking institutions' physical footprint. Thus, a conceptual research framework was developed to streamline the banking institutions' footprint regarding the interest in adopting automation within the banking industry. The descriptive statistics of the banks' annual integrated reports and fact sheets revealed an overall decrease rate of 19 percent countrywide in the number of banking outlets/branches from early 2015 to the end of 2021 for the five prominent banking institutions in South Africa, known as Absa, FNB, Nedbank, Standard Bank and most recently Capitec Bank.

Keywords
Adoption of bank automation, digitalisation, digitisation, South African banking industry, physical footprint, and banking branches.

1. Introduction
Banking institutions in South Africa traditionally rely on the physical presence through branches to bring banking solutions to their valued customers nationwide, known as traditional or conventional banking (Weichert 2017). Five players mainly dominate the South African banking industry, predominately named the 'Big five', made of Absa, Capitec bank, First national bank (Fnb), Nedbank and Standard bank. The categorisation is based on the market share of the five players within the whole South African banking industry (Writer 2020). The big five control a market share of more than 85 percent; this demonstrates why they are the entities of interest in the industry. These banking institutions were once conventional and are now entering an age dominated by automation or technology-driven practices to serve their customers more efficiently and cost-effectively (ICC 2020). As competition rages, banking institutions strive to remain relevant in the market by adopting automation-driven practices. In other words, banking institutions have significantly invested in automation to further transcend from a conventional banking system to a more automated and digitalised landscape to provide convenient solutions as well as cost-effective platforms for banking transactions (Forest and Donya 2015). The technological approaches adopted by the South African big five to position themselves to make the most of the emerging opportunities are essential. Because, going forward, banking institutions have to compete among themselves, therefore having an automated operating system that meets or exceeds customers' needs would permit these banks to have the upper hand in the competition within the banking industry (Masocha et al. 2011). However, the adoption of automation by the big five tends to have a drastic effect on the physical presence of these banks countrywide, meaning that the adoption of automation seems to influence the decision to reduce the number of branches established across the country in order to bring banking solutions to (even less-privileged) customers.

1.1 Problem statement
South Africa's big five possesses the largest market share in the banking industry. These banking institutions have integrated automation into their service delivery chain to accommodate the norm of advanced technologies in the

industry. Conventional service delivery channels such as bank branches are gradually being replaced with automated features or digital platforms to provide cutting-edge banking solutions to customers, especially during the Covid-19 pandemic (ICC 2020), which forced banking institutions to encourage customers to make use of digital banking systems. Hence, the observations are that the banking industry appears to play down the influence and the impact that the adoption of automation significantly has on establishing the physical footprint of the banks across the country in the era of automation.

1.2 Objective

Automation-driven practices have become the norm within the banking industry; the main objective of this paper is to investigate whether the adoption of bank automation contributes to the decrease in the level of banking's physical footprint.

1.3 The conceptual research framework

The proposed conceptual framework describes the influence and impact that the adoption of bank automation can have on the banking institutions' footprint as the industry enters the era of automation and digital transformation. Alternatively, the adoption of automation is considered as the independent variable, and the physical footprint is seen as the dependent variable of the research.

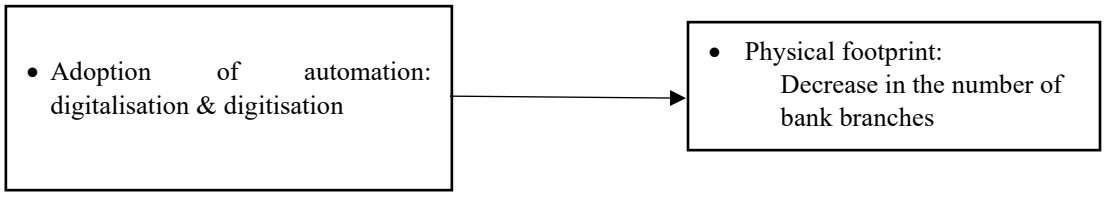


Figure 1. Conceptual research framework.

2. Literature review

2.1 Banks will be competing aggressively against non-traditional technology disruptors

Banking institutions have realised that their survival is threatened because of the disruption by both traditional and non-traditional competitors within the entire service delivery industry. As Standard bank group (2016) claimed, to remain relevant in this increasingly digital sector, one has to actively embrace innovation and its disruption as a way forward and enhance collaboration with innovation partners to deliver the promised value to its customers. Absa bank further acknowledged the technology disruption as a key operational risk impacting competitiveness (Barclays Africa Group, 2017). However, this technology disruption and innovation should not be at the expense of ensuring simplicity in product and service offerings. Also, Capitec bank (2017) claimed that new products would continue to have the same foundation of simplicity and affordability as their other products.

In regard to the first quarter of 2018, there was a large number of technology disruptors in the South African retail banking industry (Maritz et al. 2018):

- TymeDigital, a subsidiary of the Commonwealth Bank of Australia, had the plan to unleash the first full-service digital bank in South Africa to hopefully deliver affordable and accessible online banking services to customers.
- Michael Jordaan was preparing to launch a new bank named "Bank Zero"–the former CEO of C. Bank Zero would function uniquely through a fully customised application on smart devices and does not offer physical facilities for banking solutions. This bank's prime strategy is not to initially provide credits but to fully focus on basic transactional services and conquer the digital market with the aim of launching an aggressive low-fee strategy.
- On the other hand, Discovery Bank is an attempt by the insurance house Discovery to enter the South African banking industry by leveraging service delivery automation. Discovery is trying to take advantage of its substantial existing spectrum of insurance customers to launch a banking platform for these customers by providing services through digital channels (Businesstech 2018).

In regard to the business model implemented by Capitec bank since its launch, the bank has been considered as a disruptor because its functioning system strategically differentiates itself from other banks, especially from the five largest banking institutions in South Africa, Known as the "big four". Capitec bank purposefully strives to increase the number of physical branches across the country, while other banks, including the "big four", try to reduce their physical presence (branches). Additionally, Capitec bank does not try to differentiate between customers; It strives to treat them all equally (Capitec bank 2017). For instance, where other banks have developed and put in place loyalty programmes, Capitec bank does not proceed the same way. Thomas (2018) stated that bank Capitec bank has no plans to introduce a loyalty programme and is not going to have one in which a very small proportion of customers gets most of the benefits.

2.2 More efficient (and fewer physical) distribution channels: Aggressive recalibration

The banking institutions' physical branches are considered as a critical performance indicator for the service delivery chain. Thus, Nedbank has started strategically reducing physical branches across the country to optimise its operations through digitisation, and It claimed that its countrywide branches are now reduced by 2,5% (no Nedbank systems or client accounts were compromised) (Nedbank group, 2017 and Nedbank group 2019). The Nedbank strategic board claimed that the bank would keep innovation its top priority. It would strive to strategically deploy digital branches to allow its customers to shift from conventional channels to digital channels, subsequently empowering the employees with digital knowledge to provide better services to customers (Nedbank group 2019). According to Tarrant (2016), the five most prominent South African banks recently reported a shortfall of 5% in the total number of branches across the country from 3005 to 2862 between 2012 and 2015. This implies that the adoption of service delivery automation has pushed banking institutions to reduce their relative reliance on physical distribution channels.

Again, this supports the narrative that the integration of technology into bank processes has led banking institutions to migrate their operations to a more digitalised or automated environment. Thus, the decrease in the number of branches per bank is a significant shift because banking institutions were competing years ago on the number of physical components available to interact with customers (Coetzee 2009). For instance, Nedbank predicted that there was going to be a decreased level of 82 percent in its total number of branches across the country by the end of the year 2021 (Nedbank group 2019). The same integrated report further detailed that Nedbank had decreased the number of staffed outlets and subsequently launched 336 fully digital branches known as the "branches of the future". In November 2017, Nedbank launched a self-service digital branch called 'NZone' offering an interactive interface wall, a virtual reality platform, a highly secured video kiosk to interact with customers, as well as offering free Wi-Fi connectivity. This branch introduces customers to new automation-based solutions, informing and preparing customers about the new platform the bank would be offering its services in the years to come–the banking of the future (Khumalo 2017).

On the other hand, Capitec bank has purposefully focused on increasing the branches' transactions (automating transaction channels) (Capitec bank 2017). Capitec bank has demonstrated that it has a clear strategy in terms of increasing the number of branches across South Africa, with a goal of 50 branches per year (Coetzee 2018). The strategic increase in the number of branches is to ideally increase market share, especially to make the bank the first choice by customers amongst other banks in South Africa. Capitec bank had therefore targeted a market share of not less than 25% of retail clients by 2021 since the bank processes have up to five times more customer transactions than those with multiple bank accounts (Capitec bank 2017).

However, Standard bank South Africa announced a drastic reduction in the number of branches countrywide, estimated at 104 (Tarrant 2019; Writer 2019). In other words, Standard bank emphasises the digitisation of processes to extend its influence in the banking market. This approach sees Standard bank's banking network shrinking to the smallest index compared to the other four conventional banks in terms of retail outlets or service centres. The prediction has shown that by the end of June, it will likely have 525 retail branches, 201 fewer than the 726 it had at the end of 2013. It might roughly have many branches compared to Capitec bank, which is strategically penetrating the market with increased branch establishment across the country. The Standard bank board further claimed to work very hard to mitigate the impact of branch closure on the employees because approximately 1200 jobs are directly or indirectly affected, as a comprehensive list of targeted branches was published (Writer 2019).

Absa bank had substantially more "sales centres" than any other banks within the big five's spectrum in the second quarter of this decade and has not been aggressive in terms of shutting down certain of these branches across the country (Tarrant 2019). For instance, at the beginning of 2011, it had 885 sales centres/retailing branches. Thus by the

first quarter of 2018, Absa could count 698 retail branches (a comparable number to its direct rival Standard bank). That implies 187 branches were removed from the floor space. The strategy used by the Absa group is to slow down the closure of its branches as the bank is currently investing in advanced technology innovation at all its existing retailing outlets countrywide. Andy Baker, chief technology officer at Absa group, argued that the banking institution wants its customers to do what is convenient. The bank is hardly investing in brand technology–service automation currently. The bank has put considerable effort into moving the sales centres onto a brand-new fibre-optic network design with very high performance and low latency to make the branch experience better for customers (Moyo 2019). According to Tarrant (2019), Fnb (First national bank) aggressively recalibrated its business outlets' network with a reduction of 9 percent in floor space between June 2017 and July 2018. The return on investment has shown encouraging results, with bank operating costs rising just to 1 percent for a year. As Fnb decreases branch floor space by shutting down certain branches, it has also adopted the strategy in which existing branches are in strategic zones and are made smaller. For instance, the Rivonia (Johannesburg) retail branch is roughly half its original size; a similar observation is made at the Fnb branch at the Protea shopping centre in Brixton (Johannesburg). Between 2012 and the end of 2017, the bank showed a decrease of 130 branches nationwide from the peak of 775 branches in 2012. Thus, the number of Fnb's current outlets is likely to decrease below 600. The bank board asserted that reductions (closure and floor size reduction of branches) have consequently driven down the annual average cost of fitting out branches to R4.2 million. Further, the board concluded that this is now "more cost-effective" (The Banking Association of South Africa 2019; Tarrant 2019).

3. Methods

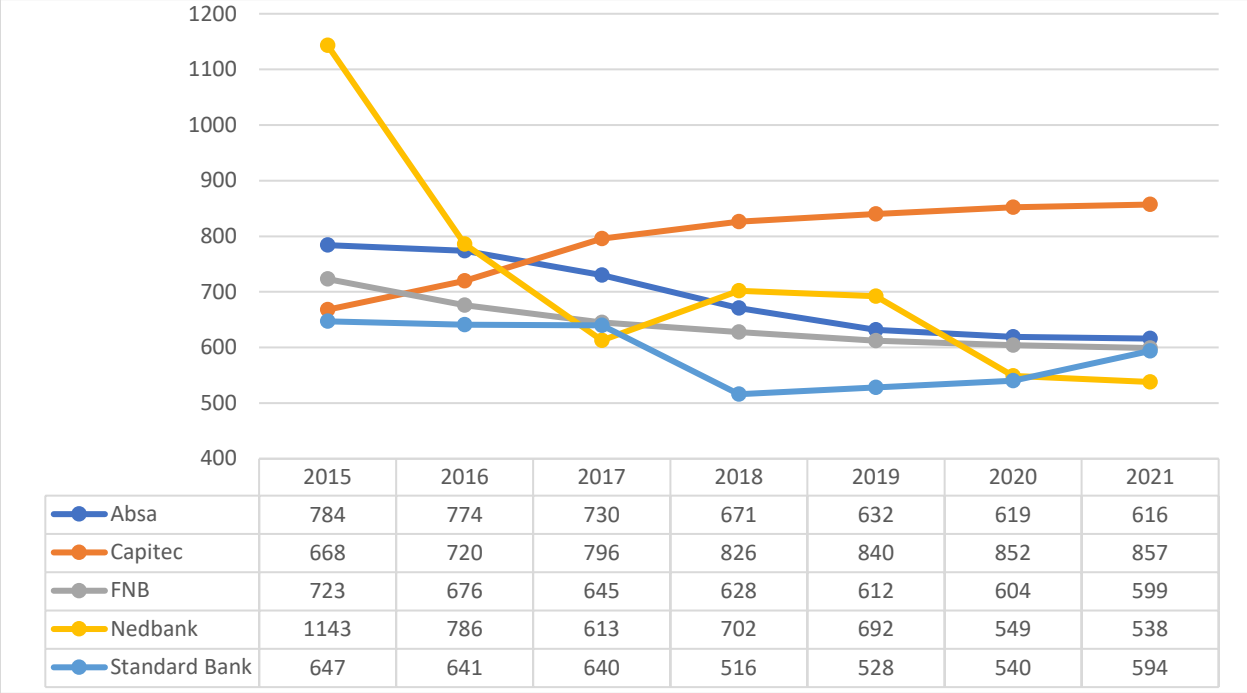
The methodology applied in this paper is purely quantitative, and it is based on the use of annual historical statistical information of the banking institutions over a period of seven years to descriptively understand the influence and impact of the adoption of automation on banking's physical footprint. South African banking institutions are obliged to annually release their financial reports and fact sheets to the public and stakeholders for transparency and accountability purposes. Therefore, the information acquired is credible and valid.

3.1 Protocol of secondary data collection

The data collected to answer the research question and reach the main objective were secondary. Secondary data collection is a method used in many previous and current studies to understand future and current phenomena in a particular field (Isabelle and Marie-Claude 2019). The analysis of the secondary data collection method is dictated by the circumstances of the original or primary data analysis (Irwin 2013). This means the conditions or the demographical constraints have to be considered to clear away the biasedness that can come along. Hence, the researcher looked into the bank's official information annually for financial transparency and audit conduct. This promotes exploring the research phenomenon of interest (Isabelle & Marie-Claude 2019) and uncovers underlying motives or attitudes toward sensitive issues (Dunn et al. 2015). Hence, the participants/respondents were the five largest banking institutions in South Africa because these banks represent a market share of more than 90% (Writer 2021). These banks were once conventional but are now transcending into a more automated landscape: Absa, Capitec bank, Fnb, Nedbank and Standard bank. The fact sheets and annual reports were used to extract the number of branches (footprint) from the year 2015 to 2021 to investigate the trend of the banking institutions' physical presence nationwide. It was also important to statistically come up with the overall percent increase or decrease (percentage difference) in the number of branches/outlets during the period of interest for the five banks. And this Percentage difference for each bank was generated by taking the number of branches in 2021 minus the number of branches in 2015, and the resulting figures were divided by the number of branches in 2015, then multiplied by 100 to generate the percentage difference as shown in Table 1.

4. Results and discussion

The historical statistical information of the five largest banking institutions in South Africa, known as the 'big five' was consolidated and presented in figure 2 and table 1 below.



	2015	2016	2017	2018	2019	2020	2021
Absa	784	774	730	671	632	619	616
Capitec	668	720	796	826	840	852	857
FNB	723	676	645	628	612	604	599
Nedbank	1143	786	613	702	692	549	538
Standard Bank	647	641	640	516	528	540	594

Figure 2. Number of outlets per year from 2015 – 2021

Table 1. Statistical Profiling of the banking institutions from 2015 to 2021

Note: Annual integrated reports and fact sheets were used for the respective banking institutions.

Source: Adapted from Absa (2021, p. 69), Absa (2019, p. 61), Capitec (2019, p. 5), Capitec bank (2020, p. 2), Capitec bank (2021, p. 7), Nedbank group (2018, p. 12), Nedbank group (2019, p. 10), Nedbank group (2020, p. 10), Nedbank group (2021, p. 11), Standard bank (2021, p. 68, 5), Standard bank (2020, p. 3), Standard bank group (2019, p. 17), Standard bank (2019, p. 229), FirstRand (2021, p. 52, 5), and FirstRand (2019, p. 61, 5).

Bank	**Number of branches/outlets**							**% difference (2015 - 2021)**
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	
Absa	784	774	730	671	632	619	616	**-21**
Capitec	668	720	796	826	840	852	857	28
FNB	723	676	645	628	612	604	599	**-17**
Nedbank	1143	786	613	702	692	549	538	**-53**
Standard Bank	647	641	640	516	528	540	594	**-8**
TOTAL	3965	3597	3424	3343	3304	3164	3204	**-19**

The results of the descriptive statistics of the banks' fact sheets and annual reports revealed an overall decrease of 19 percent in the number of branches/outlets nationwide in Table 1. Absa, Fnb and standard bank have all adopted the strategy of reducing the physical branches. Furthermore, Nedbank is a banking institution with a large number of branches shutdown at a rate of 53 percent, with 1143 branches in 2015 against 538 in 2021. On the hand, Capitec bank has seen a positive exponential increase of 28 percent with 857 branches against 668 in 2021 and 2015, respectively. This seems to contrast with the actual trend of the physical establishment of the other banking institutions. One of the primary reasons why Capittec bank keeps investing in establishing more physical branches nationwide is that it is a novice in the industry and is forced to expand its physical presence to have leverage on the existing competition. A few years back, Absa, Fnb, Nedbank and Standard bank dominated the South African banking industry. In 2000, a

new player named Capitec bank entered the industry. Ten years later, Capitec bank integrated the circle of the major banking institutions in South Africa, which is also the birth of the big five circle (Vermeulen 2018). This historical remembrance clearly demonstrates that Capitec bank is still enlarging its physical footprint by simultaneously considering the effectiveness of integrating automation into its operating system. In the annual integrated report, the Capitec executive decision-making board asserted that strategically expanding the physical footprint by establishing new branches was one of the bank's critical objectives. This is because it still needs to bring the banking solutions close to its customers (Capitec bank 2021).

On the other hand, Absa, Fnb, Nedbank and Standard are exponentially considering the decrease in the number of branches available nationwide. According to Writer (2022), South African major banks are turning to automation to reduce tedious activities. The approach has significantly influenced and impacted the decision to establish branches and make digital platforms available to customers to serve them with few resources, which allows the banking institutions to reduce relative operations costs. Furthermore, the comparison of two consecutive years from figure 2, also shows an overall decrease in the number of bank branches from year to year. This again demonstrated the new norm adopted by the big five (except Capitiec bank) to adopt bank automation as the new operating system for serving customers and remaining competitive in this industry.

In addition, the results of this paper are in line with the implications of the report published by (Mahapa 2021) for Accenture. It was described that, in a survey conducted online on 47,810 respondents across 27 countries, including South Africa, with a focus on the customers of the five prominent banks, "prior to COVID-19, only 15% of consumers had spoken to a bank advisor via video call, but nearly half (46%) said they would be willing to do so when branches reopen, and 35% said they would prefer video calls to face-to-face meetings, in other words, they prefer remote banking" (Mahapa 2021). This demonstrates the continuously changing behaviour of banking customers and the implications of that behaviour on the number of branches that need to be kept running. At this point, customers are moving towards online platforms, which implies the shutting down of a great number of branches–physical footprint reduction.

5. Conclusion

The objective of the paper was to investigate whether the adoption of bank automation contributes to a decrease in the banking's physical footprint. This objective was literally striving to assess the banking's physical presence countrywide. The researcher turned to the literature review as well as the secondary statistical information (banks' integrated annual reports and fact sheets). The finding was that service delivery automation through the adoption of banking automation is a direct determinant of the physical establishment of branches across the country for the five banking institutions. It was further detailed that fewer banking branches are physically established as the level of banking automation increases. Therefore, this demonstrated that the banks' physical footprint has decreased due to some automated processes. The big five's availability of automated and digitalised features to interact with customers was critical because customers were not obliged to visit a bank branch to do their transactions, especially during the Covid-19 pandemic. Consequently, the lack of customers visiting physical banking branches during the Covid-19 pandemic due to restrictions was also significant in this regard, and this contributed to the potential closure of many branches countrywide. Keeping certain branches open with a few customers is unnecessary from the banking institutions' standpoint.

References

Absa, Financial results for the reporting period ended December 31 2019, Retrieved from https://www.absa.africa/content/dam/africa/absaafrica/pdf/sens/2020/Results-booklet-for-the-period-ended-31-December-2019.pdf, Accessed July 5, 2022.

Absa, Financial results for the reporting period ended December 31 2021, Retrieved from https://www.absa.africa/content/dam/africa/absaafrica/pdf/sens/2021/Results-booklet-for-the-period-ended-31-December-2021-single-page.pdf, Accessed July 5, 2022.

Barclays Africa Group, Annual integrated report, 2017, Retrieved from https://www.barclaysafrica.com/content/dam/barclays-africa/bagl/pdf/ results/annual/2017-integrated-report.pdf, Accessed May 16, 2020.

Businesstech, Discovery is 'live testing' new bank capabilities as opening day nears, 2018, Retrieved from: https://businesstech.co.za/news/banking/226535/ discovery-is-live-testing-new-bank-capabilities-as-opening-day-nears/, Accessed May 22, 2020.

Capitec bank, Integrated annual report, 2017, Retrieved from: https://commondatastorage.googleapis.com/capitecbank-co-za/integrated___annual_report.pdf, Accessed June 07, 2020.

Capitec Bank, Integrated Annual Report, 2020, Retrieved from: https://www.capitecbank.co.za/globalassets/pages/investor-relations/financial-results/2020/annual-report/integrated_annual_report_2020.pdf, Accessed January 26, 2021.

Capitec bank, Integrated Annual Report, 2021, Retrieved from https://www.capitecbank.co.za/globalassets/pages/investor-relations/financial-results/2021/annual-report/integrated_annual_report_2021.pdf, Accessed June 26, 2022.

Coetzee, J., Banking the unbanked in South Africa, *South African Journal of Economic and Management Sciences*, vol. 12, no. 4, pp. 448–461, 2009.

Coetzee, J., Strategic implications of Fintech on South African retail banks, *South African Journal of Economic and Management Sciences*, vol. 21, no. 1, a2455, 2018.

Dunn, S. L., Arslanian-Engoren, C., DeKoekkoek, T., Jadack, R. and Scott, L. D., Secondary data analysis as an efficient and effective approach to nursing research, *Western Journal of Nursing Research*, vol. 37, no. 10, pp. 1295–1307, 2015, DOI:10.1177/ 0193945915570042.

FirstRand, Annual integrated report, 2021, Retrieved from https://www.firstrand.co.za/media/investors/annual-reporting/firstrand-annual-integrated-report-2021.pdf, Accessed July 7, 2022.

FirstRand, Annual integrated report, 2021, Retrieved from https://www.firstrand.co.za/media/investors/annual-reporting/firstrand-annual-integrated-report-2019.pdf, Accessed July 7, 2022.

Forest, H. and Donya, R., Delighting Customers and Democratizing Finance: Digitalization and the Future of Commercial Banking, *Deutsche Bank*, pp. 1-14, June 2015.

ICC, Digital Rapid Response Measures Taken by Banks Under Covid-19, International Chamber of Commerce (ICC), *The Digital Working Group*, 2020.

Irwin, S., Qualitative secondary data analysis: Ethics, epistemology and context. Progress in Development Studies, vol. 13, vol. 4, pp. 295–306, 2013, DOI:10.1177/1464993413490479.

Isabelle, F.D. and Marie-Claude, R., Theorising from secondary qualitative data: A comparison of two data analysis methods, *Cogent Education*, vol. 6, no. 1, 1690265, 2019, DOI:10.1080/2331186X.2019.1690265.

Khumalo, K., Nedbank opens the first digital-only branch. Personal Finance, 2017, Retrieved from: https://www.iol.co.za/personal-finance/Bank_D-opens-first-digital-only-branch-11959803, Accessed June 06, 2020.

Mahapa, J., Rapid shift to digital banking during COVID-19 accelerating erosion in consumer trust, Accenture report finds, *Accenture*, 2021, Retrieved from https://www.accenture.com/za-en/about/newsroom/company-news-release-rapid-shift, Accessed December 10, 2022.

Maritz, C., Natsas, C., Grosskopf, J. and Camarate, J, Digital disruption in the South African banking sector: A marketplace without boundaries 2.0. PWC Strategy, 2018, Retrieved from https://www.pwc.co.za/en/assets/pdf/strategyand-digital-disruption-in-sa-banking-sector.pdf.

Masocha, R., Chiliya, N. and Zindiye, S., E-banking adoption by customers in the rural milieus of South Africa: A case of Alice, Eastern Cape, South Africa, *African Journal of Business Management*, vol. 5, no. 5, pp. 1857-1863, 2011.

Moyo, A., Absa still sees value in branches. ITWeb news, August 2019, Retrieved from: https://www.itweb.co.za/content/mQwkoM6Ko4nq3r9A, Accessed June 10, 2020.

Nedbank group, Integrated Report for the year ended December 31 2018, Retrieved from: https://www.nedbank.co.za/content/dam/nedbank/site-assets/AboutUs/Information%20Hub/Integrated%20Report/2018/2018%20Nedbank%20Group%20Integrated%20Report%20(High%20Res).pdf, Accessed June 02, 2020

Nedbank group, Integrated Report, for the year ended December 31 2019, Retrieved from https://www.nedbank.co.za/content/dam/nedbank/site-assets/AboutUs/Information%20Hub/Integrated%20Report/2019/2019%20Nedbank%20Group%20Integrated%20Report%20(Low%20Res)(Single).pdf, Accessed October 20, 2021.

Nedbank group, Integrated Report, for the year ended December 31 2020, Retrieved from https://www.nedbank.co.za/content/dam/nedbank/site-assets/AboutUs/Information%20Hub/Integrated%20Report/2021/2020%20Nedbank%20Group%20Integrated%20Report%20(High%20Res%20single%20page).pdf, Accessed July 5, 2022.

Nedbank group, Integrated annual report, 2017, Retrieved from https://www.nedbank.co.za/content/dam/nedbank/site-assets/AboutUs/

Information%20Hub/Integrated%20Report/2017/2017%20Nedbank%20Group%20Integrated%20Report.pdf, Accessed May 13, 2020.

Nedbank group, Integrated Report for the year ended December 31 2021, Retrieved from https://www.nedbank.co.za/content/dam/Nedbank/site-assets/AboutUs/Information%20Hub/Integrated%20Report/2022/2021%20nedbank%20Group%20Integrated%20Report%20(1A).pdf

Standard Bank Group, Annual integrated report, 2016, Retrieved from http://annualreport2016.standardbank.com/downloads/Standard_Bank_AIR_2016_Full_annual_integrated_report.pdf, Accessed May 26, 2020.

Standard bank, Annual financial statements, 2019, Retrieved from https://thevault.exchange/?get_group_doc=18/1587063013-SBG2019AnnualFinancialStatements.PDF, Accessed July 7, 2022.

Standard bank group Group, Report to Society, 2019, Retrieved from https://thevault.exchange/?get_group_doc=18/1587064817-SBG2019ReportToSociety.pdf, Accessed July, July 7, 2022.

Standard bank, Environmental, social, governance report, 2020, Retrieved from https://thevault.exchange/?get_group_doc=18/1623759414-SBGESGReport2020FN.pdf, July 5, 2022.

Standard bank, Environmental, social, governance report, 2021, Retrieved from https://thevault.exchange/?get_group_doc=18/1649062181-SBGESGReport2021.pdf, Accessed July 5, 2022.

Tarrant, H., Banks have been cutting branches for years, *Moneyweb*, 2016, Retrieved from: https://www.moneyweb.co.za/news/companies-and-deals/ banks-have-been-cutting-branches-for-years/, Accessed June 04, 2020.

Tarrant, H., SA's 'big four' banks have shut down almost 700 branches this decade, *Moneyweb*, 2019, Retrieved from: https://citizen.co.za/business/2140329/sas-big-four-banks-have-shut-down-almost-700-branches-this-decade/, Accessed June 08, 2020.

The Banking Association of South Africa, Banks put backups in place as sector braces for shutdown, September 2019, Retrieved from: https://www.banking.org.za/news/banks-put-backups-in-place-as-sector-braces-for-shutdown/, Accessed June 10, 2020.

Thomas, S., The battle for customer loyalty heats up, *IMM Journal of Strategic Marketing*, vol.1, no. 1, pp. 6–10, 2018.

Vermeulen, F., How Capitec Became South Africa's Biggest Bank, *Harvard Business Review*, 2018, Retrieved from https://hbr.org/2018/10/how-capitec-became-south-africas-biggest-bank/, November 20, 2021.

Writer, S., Here's how many employees South Africa's biggest banks have shed, *Businesstech*, 2019, December 2019, Retrieved from: https://businesstech.co.za/news/banking/361936/heres-how-many-employees-south-africas-biggest-banks-have-retrenched/, March 15, 2020.

Writer, S., South African banks face a battle against Covid-19 fallout – and each other, says an analyst, *BusinessTech,* June 2020, Retrieved from: https://businesstech.co.za/news/banking/403789/south-african-banks-face-a-battle-against-covid-19-fallout-and-each-other-says-analyst/. Accessed June 21, 2022.

Writer, S., How South Africa's 5 biggest banks continue to dominate, Businesstech, 2021, Retrieved from https://businesstech.co.za/news/banking/506740/how-south-africas-5-biggest-banks-continue-to-dominate/#:~:text=The%20five%20biggest%20banks%20in%20South%20Africa%20continue,in%20the%20country%2C%20valued%20at%20approximately%20R5.8%20trillion, Accessed November 25, 2021.

Writer, S, These jobs at South Africa's major banks and finance companies are now being automated, *Businesstech*, 2022, Retrieved from https://businesstech.co.za/news/it-services/602184/these-jobs-at-south-africas-major-banks-and-finance-companies-are-now-being-automated/#:~:text=A%20growing%20number%20of%20South,country%20manager%20of%20Blue%20Prism, Accessed October 14, 2022.

Biography

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