Paper #1: Overview of Digital Transformation in Namibia[1]

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[2] The other two papers to be presented are; Paper 2: Improving Government Service Delivery through E-service, Paper 3: Digital Transformation for Sustainable Economic Development: Other country experiences and policy options for Namibia.

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Executive Summary

Digital transformation has received considerable attention over the past several years. The Namibian economy over the past years witnessed a rise in the use of technology to deliver services more efficiently in various industries and sectors such as banking, payment systems, foreign exchange services, insurance, investments, and the public sector. The emergence of the COVID-19 pandemic has led to a surge in digital platforms ranging from electronic commerce (e-commerce), digital payment methods and the provision of electronic services (e-services) from both the public and private sectors. Digital transformation ultimately leads to a digital economy whereby manual processes are improved or replaced by digital technology.

The World Bank's review on Digital Economy for Africa provides the fundamental elements of a digital economy. The fundamental elements can be summarised into the following pillars, (i) telecommunication, electricity services and network infrastructure, (ii) public and private digital platforms, (iii) digital financial services, (iv) digital skills and (v) the regulatory and policy environment. Wider access to telecommunications, electricity and reliable network coverage are an important vehicle to drive the agenda of digital transformation in the economy. Equally, investments in digital platforms to reduce manual processes from both government and the private sector will eventually lead to faster and efficient service delivery. Moreover, digital financial services are premised on banks and non-banking financial institutions providing financial services through digital platforms offering convenience and affordable means of performing financial transactions.

Several opportunities, if explored correctly, could expedite digital transformation in the country. The investment in the Equiano cable capacity means that service providers will be able to offer their clients international internet capacity, a much-needed diversified route. An enabling regulatory environment to foster more FinTech services is needed for the financial sector and the economy to realize the FinTech benefits.

Challenges that may limit digital transformation in the country if not addressed, have been highlighted. There is a lack of modern ICT infrastructure, electricity supply and limited internet access in rural and remote areas. The costs of doing business in Namibia remains high and it costs a lot of time and money for new businesses to setup in Namibia. Manual processes and the heavy reliance of cash to move goods and services creates a huge

challenge towards aspirations of a digital economy. There is a lack of fairness between regulated and unregulated entities, as it creates an unlevelled playing field.

The assessment on the various pillars indicate that Namibia has made great strides in digital transformation. The banking and financial institutions have made significant improvements in the digital spheres and have largely moved from cash transactions to more cashless transactions. The country's access to the WACS cable as well as the expected Equiano cable puts the country at a higher level of digital infrastructure. Despite these achievements, the country still has a lot to do, especially in electrification in rural areas as well as the need to advance in the digital platforms pillar as e-commerce merchants and open data in the country are still at a lower level.

Recommendations to alleviate some of the challenges are listed as: Namibia needs to expedite the adoption of digital platforms from both a private and public perspective to reach the aspirations of HPP2; Increase scientific and technological human and institutional capacity; Strengthening infrastructure in ICT and electricity in rural areas to ensure digitalization is countrywide; Access to affordable financial services is critical for poverty reduction and economic growth; Expedite regulatory reforms necessary to fast-track digital transformation; Promote Infrastructure sharing to avoid the multiplicity of initiatives and redundancies in the deployment of infrastructure; There is a need to accelerate data-sharing and drive business growth

I. INTRODUCTION

1. **Digital transformation has received considerable attention over the past several years and has intensified with the onset of the COVID-19 pandemic.** Over the past years, the Namibian economy has witnessed a rise in the use of technology to deliver services more efficiently in various industries and sectors such as banking, payment systems, foreign exchange services, insurance, investments, and the public sector. The emergence of the COVID-19 pandemic has seen a surge in digital platforms ranging from electronic commerce (e-commerce), digital payment methods and the provision of electronic services (e-services) from both the public and private sectors. Digital transformation ultimately leads to a digital economy whereby manual processes as well as brick-and-mortar infrastructure are improved or replaced by digital technology.

2. **Four key pillars[3] which can enable Namibia to transition towards a digital economy, are identified within the paper.** The fundamental elements of a digital economy can be summarised into the following pillars, (i) telecommunication services, electricity supply and network infrastructure, (ii) public and private digital platforms, (iii) digital financial services and (iv) the regulatory and policy environment. Wider access to telecommunications and reliable network coverage is an important vehicle to drive the agenda of digital transformation in the economy. Equally, investments in digital platforms to reduce manual processes from both government and the private sector will eventually lead to faster and efficient service delivery (Feyen, Frost, Gambacorta, Natarajan & Saal, 2021). Moreover, digital financial services are premised on banks, non-banking financial institutions as well as FinTech entities providing financial services through digital platforms offering convenience and affordable means of performing financial transactions.

3. **According to the OECD (2020), the digital economy incorporates all economic activity reliant on, or significantly enhanced using digital technologies, digital infrastructure, digital services, and big data management.** Digitally transforming the economy can therefore be described as the integration of digital technology and innovations into various economic activities with the aim of ultimately achieving a digital economy. The overall objective of digital transformation in the country is to position the

[3] This was guided by the World Bank Group Digital Economy for Africa (DE4A) Country Diagnostic initiative reports.

country to leverage on the ever-growing technological advancements, digital evolutions, and innovations.

4. **The Bank of Namibia, in an effort to evolve with times, has developed a digital transformation strategy to position the Bank to enhance the efficiency and effectiveness of its operations.** The objective of the digital transformation strategy is to improve the delivery of its services to its stakeholders, both internally and externally, by leveraging technology and digital evolutions or innovations.

5. **The emergence of financial technology[4] (FinTech) entities has disrupted the status quo in terms of financial services delivery.** FinTech companies, as they are known, are competing with traditional banking services by providing cheaper and innovative financial services. While banks have embraced technology to deliver financial services more efficiently, the evolution of FinTech entities has led to more consumer choice and convenient ways of making payments. Due to their lean structures, FinTech companies, such as PayPal, can deploy a myriad of financial innovations across multiple jurisdictions seamlessly and efficiently without establishing physical presence in most of the jurisdictions (OECD, 2020). While most FinTech innovations are deemed beneficial to the financial sector and bring about efficient financial services to consumers, they are usually not accommodated by existing laws or regulations and may create risks in the financial system due to the absence of any laws or regulations. In response, regulators often develop FinTech regulatory frameworks to oversee the operations of FinTechs in controlled environments such as regulatory sandboxes and innovations hubs.

6. **From a regulatory perspective, the Bank of Namibia recently developed a Financial Technology (FinTech) Regulatory Framework.** The Framework aims to provide guidance on how the Bank will treat FinTech innovations that are not already subjected to the Bank's existing regulations. The Bank intends to subject FinTech innovations to a phased regulatory programme to understand, evaluate and test the innovation before a regulatory outcome can be determined. Three (3) regulatory tools are used in the Framework namely, the Allow-and-See Approach, the Test-and-Learn Approach and the Regulatory Sandbox Approach.

[4] There is a distinction between financial technology (also used by traditional banks) and FinTech companies providing innovative payments and other financial services. This section refers to FinTech companies.

7. **Digital transformation has been recognized in most of the national documents (Vision 2030, NDP5, HPP2, etc.) as an enabler to economic growth.** The Namibian Government's Vision 2030 document stipulates that ICT must be the most important sector in the economic development of the country by 2030. Similarly, the government has an ambitious Broadband Policy aiming to provide 95 percent population coverage by 2024[5]. The policy also aims to expand electricity supply infrastructure to rural areas to enable internet routers or modem devices to be switched-on around the clock. As such, Namibia implemented an Information, Communication and Technology Policy in 2004 which was later improved in 2008. Furthermore, the Ministry of Information and Communication Technology has indicated that the review of various information and communication technology policies and their possible consolidation into a uniform national ICT policy is on the cards.

8. **The main objective of this paper is to provide an overview on the digital transformation taking place in the Namibian economy by using four key pillars that are considered as fundamental requirements for a digital economy.** The paper will also look at the strengths and weaknesses in the various pillars. To achieve this objective, the rest of the paper is organised as follows; section 2 provides areas of assessment for an economy. Section 3 considers Namibia's telecommunications and network infrastructure while section 4 deals with digital platforms. Section 5 provides an analysis on digital financial services in Namibia followed by section 6 which looks at the regulatory environment. The paper concludes with section 7 and gives policy recommendations in section 8.

II. ASSESSMENT AREAS

9. **The World Bank has developed areas of assessment which they use to determine the level of maturity of an economy[6].** The table below (Table 1) shows the different levels of maturity of an economy, based on what is established in terms of ICT in the economy. It shows the different areas of advancement according to the World Bank, starting from the infancy stage (nascent) to the advanced stage.

[5] Government Notice No.189. Publication of National Broadband Policy: Communications Act, 2009.
[6] Digital Economy for Africa – Diagnostic Tool and Guidelines

Table 1: Areas of assessment based on Maturity of Economy

	Nascent	Growing	Advanced
Digital infrastructure	Access to undersea internet cables, backbone networks	Backbone networks, data clouds, IXPs, privacy, and cybersecurity	4G/5G networks, rural connectivity, internet of things
Digital platforms	Digital shared services, digital identity, and digital financial management	Digital government, open data, e-commerce	Mobile apps, AI applications, and software-enabled platforms
Digital Skills	Bootcamps and digital skills training	Business, management skill training	Digital-savvy workforce
Digital financial services	Basic digital payments, e.g. person-to-person payments	Broad digital payments, e.g. business-to-person, government-to-person	Digital financial services, e.g. savings, credit, insurance

Source: World Bank

10. **The World Bank Diagnostic Tool and Guidelines is used to analyse the Namibian economy based on its achievements thus far.** The assessments of the different pillars in the Namibian economy are guided by the World Bank Diagnostic Tool and Guidelines as shown in Table 1 above.

III. DIGITAL INFRASTRUCTURE

11. **Telecommunication services and network infrastructure are integral to digital transformation.** Sound communications and network infrastructure are key for Namibia to transition to a digital economy. The absence of reliable and secure high-speed networks and data centres in all corners of the country could lead to an incomplete digital transition. There is a need to increase the capacity of transmission networks and leverage investment in infrastructure to promote last-mile connectivity to underserved areas by mobilising blended finance (International Telecommunication Union, 2021). Access to broadband connectivity and digital infrastructure is a priority area for public institutions and private organisations in the field of digitalisation.

12. **Provision of electricity supply is equally important.** The entire digital ecosystem relies heavily on reliable, affordable electricity, from home internet connections to the base stations that underpin cellular networks to the data centers that store the internet's content. Therefore, a good telecommunication infrastructure without electricity becomes very ineffective.

a) Telecommunication services in Namibia

13. **Namibia has three mobile network operators (MNOs) namely Mobile Telecommunication Company (MTC), Telecom Namibia and Paratus Telecommunications (Paratus).** Until 2006, only MTC provided mobile network services in Namibia. The introduction of more MNOs means improved competition among the three providers which is ultimately beneficial for the Namibian economy. All three MNOs provide internet access and cellular network coverage across the country. While mobile penetration is well above the regional average, investments in LTE and fibre-optic has introduced faster broadband connections[7].

14. **There is, however, still insufficient competition which causes higher consumer prices and lower quality of service.** The sector remains highly concentrated with MTC and Telecom Namibia controlling 88 percent of the assets and 82 percent of the revenues in the market (CRAN, 2021). Moreover, MTC is dominant for mobile Telephony, while Telecom Namibia for fixed-lines and national data connectivity. The introduction of smaller broadband service providers such as Paratus and MTN Business Solutions Namibia (MTN) has, however, shifted the structure slightly. The combined revenue share of MTC and Telecom Namibia has declined slightly from 84 percent in 2018 to 2020 and cost of data has reduced slightly as well.

15. **The number of active SIM cards and mobile broadband subscribers has increased over the past 5 years.** Since 2015, the total number of active SIM cards rose by 14 percent to 2.9 million. These statistics represents the wide usage of mobile phones in the country. Mobile phones are largely considered the cornerstone in the drive towards financial inclusion and access to affordable financial services. Similarly, mobile broadband has increased by 24 percent indicating that more people are now using

[7] https://www.businesswire.com/news/home/20190819005433/en/Namibia-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses-2019---ResearchAndMarkets.com

internet services in Namibia. Internet further allows users to access various public and private digital platforms which further drives the notion of digital transformation.

16. **Financial service providers have over the years taken advantage of the telecommunication services to provide financial products such as electronic money (e-money) and internet banking platforms to their customers.** However, there is insufficient ICT infrastructure as well as lack of electricity in certain parts of the country that could cause a divide between rural and urban users. The urban client may be sufficiently covered but not the rural. According to the Namibia Financial Inclusion Survey report of 2017, access to communications technology was at 80 percent for urban, while only a mere 20 percent of rural users had access to technology (there might have been significant changes in this regard due to the 081everyone campaign by MTC).

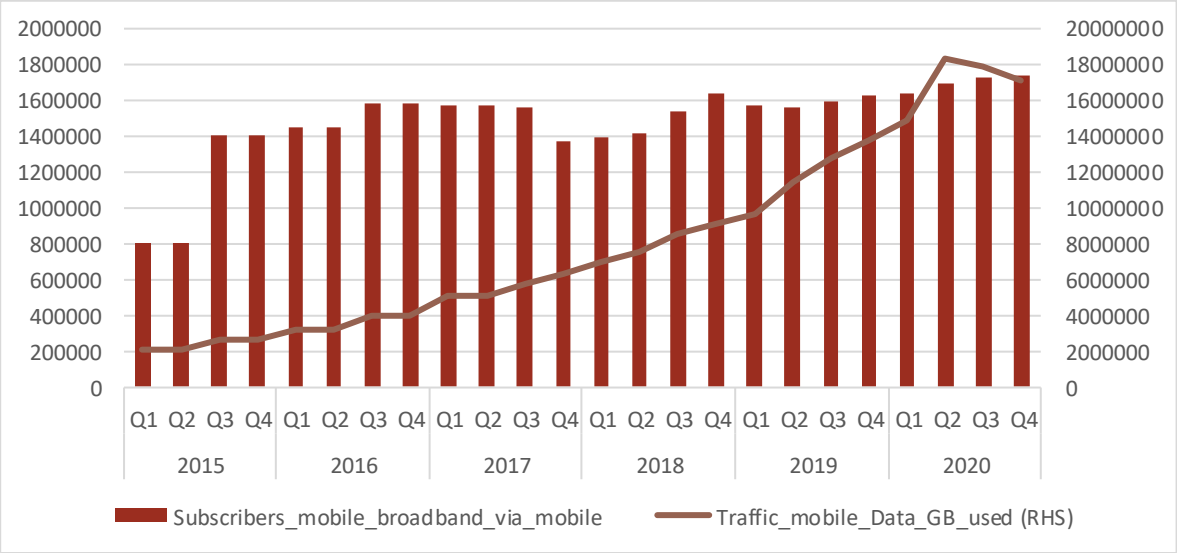
Table 2: Mobile subscriber numbers in 1000s

		2015	2016	2017	2018	2019	2020
Active SIM cards ('000)	Prepaid	2,370	2,470	2,485	2,566	2,628	2,702
	Postpaid	180	191	195	193	195	197
	Total	2,550	2,661	2,680	2,759	2,823	2,899
	Change %		4.4	0.7	2.9	2.3	2.7
Mobile Broadband ('000)	Mobile Phone	1,406	1,580	1,377	1,638	1,631	1,741
	Dongle / Routers	37	31	36	32	22	26
	Total	1,443	1,611	1,413	1,670	1,653	1,767
	Change %		11.6	-12.3	18.2	-1.0	6.9

Source: CRAN

17. **Internet usage increased significantly over the years as seen in mobile broadband subscription and mobile data usage.** There are significant increases in data usage since 2015 as depicted in Figure 1 below. Although data from home use is not available due to the unlimited data provided, a clear increase is seen in the mobile data usage which increased to 17,132,656 Gigabyte (17,133 terabyte) in the fourth quarter of 2020 from below 4,000,000 Gigabyte (4,000 terabyte) in the first quarter in 2015. Mobile broadband subscription also increased over the years, with moderate increases over the last three years.

Figure 1: Mobile broadband subscription vs mobile traffic data (GB) used



Source: CRAN

b) Broadband services in Namibia

18. **Access to the international submarine fibre optic cables has reduced costs of internet services in the country.** Although Namibia's internet and broadband sector is reasonably competitive, with six ISPs active, its development was for long held back by high prices for international bandwidth caused by the lack of a direct connection to international submarine fibre optic cables. This changed in 2011 when the West Africa Cable System (WACS) cable landed in the country. International cable services were launched in May 2012. Furthermore, operators invested in diversifying terrestrial access routes to adjacent countries[8].

19. **Additionally, Namibia will receive the Equiano cable, which is about 14 000km long, for increased internet bandwidth in the country.** The country is set to receive its second submarine fibre-optic internet cable in 2022 which promises to enhance the reliability of increased internet bandwidth for the country, and for the rest of Southern Africa. Like the WACS that landed at Swakopmund a decade ago, the new 'Equiano' cable is about 14 000km long and will span from Portugal to South Africa with nine branching units, of which one branch is Namibia, through Swakopmund.

[8] https://www.budde.com.au/Research/Namibia-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses

20. **The government has an ambitious Broadband Policy aiming to provide 95 percent population coverage by 2024.** This will be supported by the telecommunication companies (telcos) which continue to invest in their own extensive network objectives. Population coverage for Namibia stood at 89 percent by June 2021, compared to 78 percent in 2019, while 79 percent of the population was covered by 4G in June 2021 compared to 40 percent in 2019 (CRAN, 2021). The increase in coverage is mainly attributed to the 081everyone campaign by MTC which aims to cover the whole population. 5G services have been delayed, partly due to public concerns for the technology which caused the government to order an environmental assessment of 5G in mid-2020 while also requesting that the regulator speed up its 5G development strategy[9].

Table 3: Internet subscribers

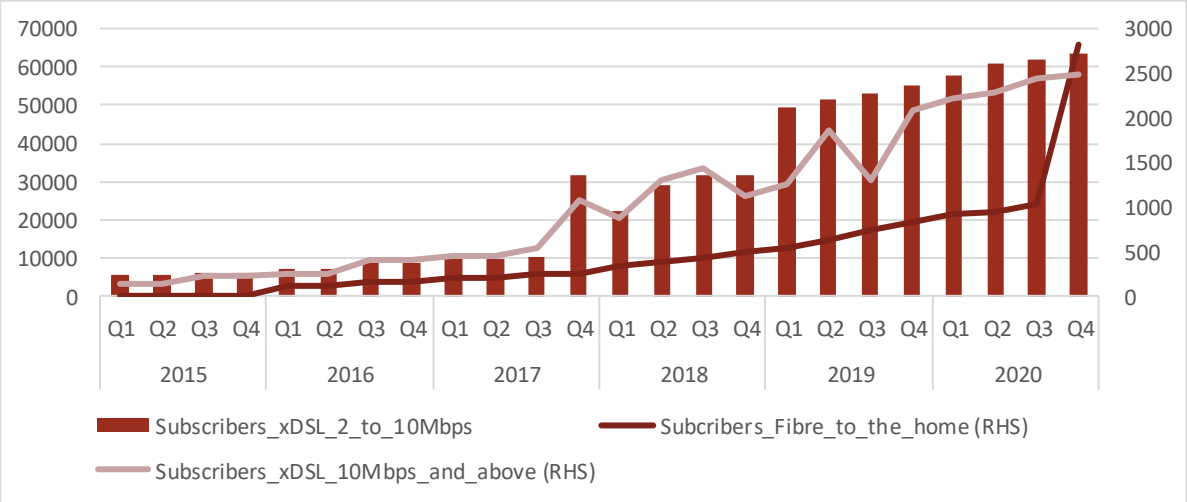
		2015	2016	2017	2018	2019	2020
ADSL	10Mbps_and_above	224	416	1085	1117	2090	2494
	2_to_10Mbps	6307	8706	31489	31586	55314	63696
	below_2Mbps	39660	44259	21950	21311	3272	2234
	Total	46191	53381	54524	54014	60676	68424
	Change %		15.6	2.1	-0.9	12.3	12.8
Fibre to home		11	158	252	498	829	2832
MetroNet (ethernet)		32	386	591	496	370	264
Leased lines		8462	9959	7621	6489	5416	4012
Other wireless		89	124	364	379	771	2347
Satellite / VSAT		354	354	542	960	881	759
VoIP		127	3286	3233	3901	4054	3046

Source: CRAN

21. **Internet subscription increased over the years and increased further due to the COVID-19 pandemic.** The different internet options, experienced a sharp increase in subscriptions from 2019 to 2020, as seen in Figure 2. Fibre to home saw the biggest increase from 11 subscribers during 2015 to 2832 subscribers in 2020. This is because fibre is relatively new in Namibia and has only recently been offered for home use. Subscribers also moved to a faster internet connection with the new product offerings as the below 2 MBs product has become too small for today's use and application.

[9] https://developingtelecoms.com/telecom-business/market-reports-with-buddecom/10087-namibia-plans-privatisation-of-namibia-telecom-and-mtc.html

Figure 2: Mobile broadband subscription vs mobile traffic data (GB) used



Source: CRAN

c) Strengths and weaknesses in digital infrastructure

Strengths/Opportunities

22. **The increased capacity from the Equiano cable will provide Namibia with the necessary redundancy as a connectivity backup.** The investment in the Equiano cable capacity means that service providers will be able to offer their clients international internet capacity, a much-needed diversified route, security of supply and unmatched quality of service (Qui, 2021).

Weaknesses/Challenges

23. **The low competition in the telecommunications and broadband services increases the risk of higher consumer prices and low-quality services.** The dominance of MTC in mobile telephony and Telecom Namibia for fixed-lines and national data connectivity causes a lack of competition in the telecommunications and broadband services. Despite the increase in the share of assets and revenues of smaller licensees, the high market concentration raises the concern of insufficient competition with higher consumer prices and lower quality of service as a result (CRAN, 2018). The lack of investors in the telecommunication and broadband services is one of the contributing factors to the low competition in the sector as ICT requires huge capital injection. Namibia's small population size also plays a role in the number of players that can enter the market.

24. **The Broadband policy also highlighted several weaknesses in infrastructure development, especially in the rural areas.** There is a lack of modern ICT infrastructure and limited internet access at public facilities in rural areas. Furthermore, there is insufficient electricity in rural areas. There is also inadequate capacity (human and financial resources) to implement projects that may already have been formulated.

IV. PUBLIC AND PRIVATE DIGITAL PLATFORMS/SERVICES

25. **Digital platforms are heavily reliant on telecommunication services, electricity supply and network infrastructure to contribute towards a digital economy.** Digital transformation therefore entails modernizing service delivery mechanism and platforms to provide end users with better experiences and quality service. Government as an essential service provider would ideally benefit from digital transformation and the use of technology to provide most of its services (OECD, 2016). Essential services such as healthcare, education, trade, and other public services can all benefit from digital transformation. Moreover, in the private sector, online and mobile shopping platforms also known as e-commerce or mobile commerce continue to provide customers with alternative methods of shopping and making payments. The development of domestic Information Technology (IT) skills and capabilities can enable the country to become digital through the creation of affordable digital platforms that can serve both the public and private sector.

26. **The Government has for the past years embarked on a digitalization journey to improve administrative processes and service delivery.** The third goal in the Harambee Prosperity Plan II (HPP2) is to improve performance and service delivery through various efforts, one of which is digitalization. HHP2 plans to accelerate the roll-out of key e-governance services at national and regional levels which include functional e-procurement, e-health, e-learning, e-business, social protection, and civil registration and identification systems. The below describes some of the public digital platforms introduced by Government over the years:

(a) Public Digital Services[10]

The one-stop-shop

27. **A portal, NamBizOne portal, which will give information to both foreign and domestic investors on establishing businesses in Namibia was developed and launched.** The project is a commitment to improve the ease of doing business in Namibia. It is a one-stop-shop gateway to doing business in Namibia. The one-stop-shop is already being jointly developed by Ministry of Industrialization and Trade, Ministry of Finance, City of Windhoek as well as the Social Security Commission. The project is at an advanced stage (about 90% complete).
    - ✓ Stage 1: improving business engineering processes – 100% complete
    - ✓ Stage 2: development of a virtual platform/portal (the interfacing of various systems) – project is delayed by 2 years due to budget constraints.
    - ✓ Stage 3: Launch and maintenance – not started, depends on Stage 2.

E-Government Procurement (E-GP)

28. **The e-Government Procurement (E-GP) will be developed by the Office of the Prime Minister (OPM) as custodian of all government IT systems**. E-PG will be implemented in a phased approach, with the 1st phase to be assessed to determine the roll out of the remaining phases. E-GP - starting with a pilot implementation in a selected number of highly active procuring entities having ready ICT infrastructure. The e-GPS project will be executed in three (3) phases over at least two (2) years starting 01 April 2020. E-GP will replace the existing manual system of bid solicitation, evaluation, and contract management. The system should solve the current problem of absence of public procurement data with adequate data analytics providing useful information for the policy decisions and strategic actions. The Public Procurement Act 15 of 2015 that will allow the system to fully function is currently in the process of being amended. Staff members are also undergoing training for the new system.

Electronic Document and Records Management System (EDRMS)

29. **The EDRMS system involves the modernization of paper based and electronics records management practices to ensure compliance with the Archives Act.** Project objective is to ensure that a risk-free records and archival system is set up for use by the Public Service in an Information Communication Technology (ICT) environment in line with the eGovernment Policy directives and internationally

[10] Please see a comprehensive list in Appendix A, Table 2.

recognized standards. EDRMS has been fully implemented in 13 Offices/Ministries/Agencies (OMAs), and partially implemented in 17 OMAs, while 7 OMAs are not yet on-board but have been trained and prepared to join. Despite this, very few staff are rolling out the system.

e-Health

30. **The Ministry of Health and Social Services introduced the Integrated Health Care Information Management System (IHCIMS) in 2011.** The IHCIMS, known as E-Health system, is web-based, and covers all aspects of hospital management and day-to-day operations of hospitals. Under the E-Health system, all patients will be allocated a unique Medical Health Record Number (MR Number), which can be used across 34 State hospitals in Namibia and will eliminate the need for patients to carry medical passports or treatment records. The system should have replaced all manual procedures and systems in the hospitals, aiming for paperless hospitals. The ministry has decided to go for an off the shelf product and they are busy with the tendering process.

e-Education

31. **The higher education system has changed, accelerated mainly by the COVID-19 pandemic, with the distinctive rise of e-learning, whereby teaching is undertaken remotely and on digital platforms.** The Namibian higher education sector has revised several programmes and benchmarked with regional/international industry and academic standards. The Namibia University of Science and Technology (NUST) has launched a strategic partnership with MTC through the High-Tech Transfer Plazza Select (HTTPS) initiative. HTTPS is a physical and virtual ecosystem for technological driven projects to accelerate innovation for the creative value chain and tap into the digital economy. The Inclusive and Collaborative Tech Innovation Hub (TechHub) is a project-based service-learning through augmented reality and virtual reality. The university also has hybrid programme offerings with predominant online teachings and a few face-to-face. Additionally, to increase skills in digital transformation, the taught plus thesis Master of Data Science degree is introduced to start in 2022. The university also offers Cyber Security courses for undergraduate and postgraduate studies. Ethical Hacking and Information Security, Python Programming for Machine Learning/Artificial Intelligence and Big Data Technologies can be obtained from the India - Namibia Centre of Excellence in Information Technology at NUST.

32. **The University of Namibia (UNAM) has also fully embraced e-learning as it has switched its programme offerings to online with very limited face-to-face classes for a few professional programmes for both 2020 and 2021.** The university also provided e-learning devices to its students. The University increased its provision of existing data and data devices to all staff and students. In 2021, UNAM upgraded its IT infrastructure to a Hyper Convergence Infrastructure to improve online offerings. Online learning tools include a variety of applications such as Moodle, Big Blue Button, an own developed Panopto Software platform, ITS, and other online platforms. The University uses both licensed Zoom and MS Teams from Microsoft 365 for virtual interactions and online learning. In addition to the formal degree programmes in Computer Science, Information Technology, Information Systems, etc. and related fields at Bachelors, Masters and PhD levels, UNAM offers a wide variety to technology and ICT opportunities. A Masters in Cybersecurity is also offered. The University has a Virtual Institute for Scientific Computing and Artificial Intelligence and has two supercomputers in its High-Performance Computing Centre for big data and data analytics of its big data sources from the High Energy Stereoscopic System (HESS) which are gamma ray telescopes used for astronomy. UNAM concluded an MOU with the Africa Blockchain Institute (ABI) to introduce a MSc: Blockchain Technology as well as several short courses in blockchain technology. UNAM also has an tech innovation incubator where 4 AI in Agriculture innovators sponsored and partnered with Google as well as 5 tech innovators under the Chancellors Innovation Fund and sponsored by Telecom and UNDP are being incubated.

33. **Basic education in the country, however, still has a long way to do, mainly due a lack of funds in the ministry.** Although the ministry has provided a few e-learning materials to different schools, due to a lack of funds in the ministry, even for basic textbooks (1 to 1 ratio), therefore, remote teaching and e-learning is still a pipedream. Most pupils do not have access to good ICT infrastructure, electricity and/or the tools needed to perform their work remotely.

34. **The Namibia students' financial assistance fund (NSFAF) has also embraced e-learning as they have rolled out laptops and internet devices to students.** The NSFAF, through the Ministry of Higher Education, Technology & Innovation, has purchased laptops and internet devices to provide students with the necessary equipment for e-learning. A total of 10,500 laptops were received in October for

university students, both NSFAF beneficiaries, as well as private students. The Telecom internet devices were given earlier.

Civil registration and identification

35. **All vital events were registered in physical civil registries (e.g., births, deaths, etc.) and handwritten certificates (birth, death, marriages, etc.) were issued for each.** Over time, government has moved to digitalizing the process. Automated Fingerprint ID System (AFIS) was introduced in 2004 for enrolling of 10x fingerprints and to provide fingerprint search and verification functionalities. Electronic National Population Registration System (eNPRS) is a system which will improve the efficiency, traceability and accountability of the civil registration and identity processes. The government aims to establish a sustainable, cost effective, stakeholder focused world class integrated National Identity Management System to strengthen Civil Registration, Civil Identification, Population Management, and Vital Statistics in Namibia by 2022.

36. ***e-Birth notification of children born at health facilities:*** This system will allow for the notification of births to ensure that births are registered in the acceptable time. The E-Birth Notification System was awarded the prestige Radiant Launch Award by the Association of Professional Social Compliance Auditors (APSCA) for providing the most significant developments in the area of public sector identity schemes, applications and services in 2018. The system was launched last year 2017, however, financial support is required to rollout to all health facilities including private hospitals.

37. ***e-Death notification System:*** This system will allow for the notification of death to ensure that deaths are registered in the acceptable time and to avoid fraudulent activities in the death process. The system has been launched and is available at the Ministry of Health and Social Services (MoHSS) Hospital (Katutura & Windhoek Central) and Mortuaries of MoHSS. Financial support is needed to rollout the system to all mortuaries and health facilities.

ITAS Tax System

38. **The integrated Tax Administration System (ITAS) was introduced to improve service delivery for taxpayers.** ITAS is an online system that provides taxpayers with 24/7 access to their tax accounts to execute various self-services such as new tax registration, filling tax returns, applying for tax refunds as well as reporting tax crimes amongst other. ITAS reduces manual tax administration processes for both the

government and taxpayers by offering the convenience of executing all tax related matters on the digital platform. The system is currently being administered by the newly created Namibia Revenue Agency which is the tax collecting authority. The system is fully functional, however there is a lack of IT staff to manage and support the system as well as establishing interoperability with third party systems. Another challenge is the lack of adoption of e-filing by citizens and businesses.

ASYCUDA

39. **ASYCUDA is a computerized customs management system which covers most foreign trade procedures.** The system handles manifests and customs declarations, accounting procedures, and warehousing manifest and suspense procedures. The ASYCUDA programme is planned in consultation with the Customs authority and related government agencies taking into consideration the particular trader and transport operator environment. The ASYCUDA programme is directed at reforming the customs clearance process. It aims at speeding up customs clearance through the introduction of computerization and simplification of procedures and thus minimizing administrative costs to the business community and the economies of countries. The system is fully operational in all regions.

Namibia Integrated Employment Information System (NIEIS)

40. **NIEIS is a system initiated by the Ministry of Labour, to collect, store and update information of job seekers.** The system stores names, qualifications and occupations of job seekers; vacancies in the labour market; specialized skills and qualifications possessed by Namibian citizens and permanent residents and employers in Namibia. The main purpose of the system is to register job seekers, vacancies in the public and private sector and assist job-seekers in finding suitable employment. On the same system, companies are able to upload opportunities, namely; vacancies, tenders and grants. Companies can also apply on the system for tenders offered by other companies directly online and the system enables the employers to match the job seekers to available opportunities on the system. Registered job seekers are able to manage their online resume, search and apply for available opportunities online and have their online resume permanently stored and available for viewing by employers.

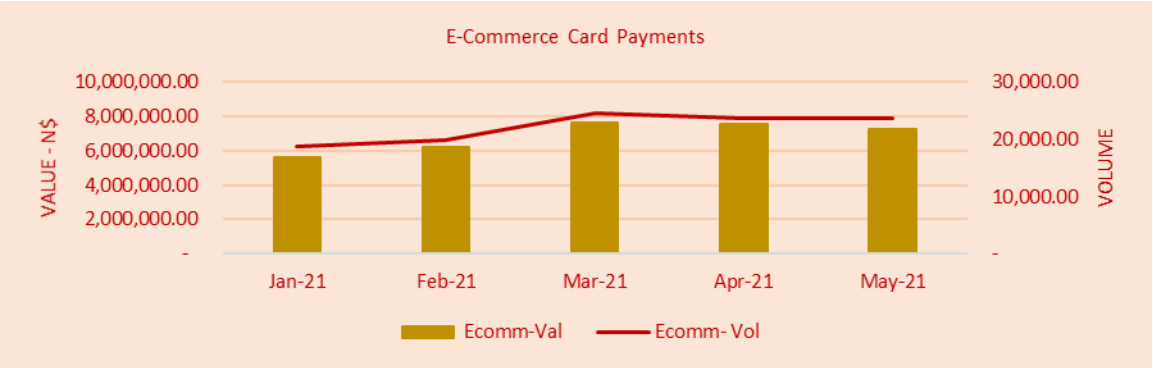
(b) Private Digital Platforms

41. **The adoption of digital platforms by private entities are equally important for digital transformation in the economy.** Digital platforms eliminate manual and cumbersome processes for both businesses and consumers. Various corporates in Namibia (refer to table 3) have gone digital to serve their client base for convenience, faster service and better experience in accessing products and services. Most companies now have websites and mobile applications providing customers with easier access to their services.

42. **E-commerce and digital payment platforms are on the rise in Namibia.** As of May 2021, four (4) banks[11] together and two (2) payment gateway service providers[12] provide e-commerce capabilities to 442 e-commerce merchants in Namibia. These merchants can now sell their goods and services online through websites and mobile applications and conveniently receive online card payments. While e-commerce merchants are increasing sales and reaching a wider customer base through online shops, it has now also become more convenient for cardholders to make card-not-present payments on websites and through mobile phone applications (Bank of Namibia, 2020). E-commerce platforms afford consumers the convenience of shopping and making payment online without entering a physical store. E-commerce merchants equally benefit because they are able to reach a wider customer base and also receive payments from anywhere in the world.

43. **The graph below depicts the volumes and values of e-commerce payments from January 2021 to May 2021.** E-commerce monthly transactions volumes were on average 22,057 with an average value of N$6.8 million during the first 5 months of 2021.

Figure 3: E-commerce card payments



[11] First National Bank, Bank Windhoek, Nedbank, and Standard Bank
[12] Direct Pay Online and Wire Card Namibia

Source: Bank of Namibia

44. **The Table below provides and describes some of the private digital platforms available in Namibia.** Not all digital platforms have integrated payment systems to enable customers to pay online. In most cases, customers are required to use alternate means of payments such as using EFT, e-money or even cash upon delivery of the services. Complete digital transformation would require all digital platforms with business offerings to provide payment options to complete online service experience.

Table 4: Examples of Private/Commercial Digital Platforms in Namibia

Private/Commercial Digital Platform	Description of Business Offering	Integrated Payment System
MTC	Mobile network services	No
Namib Wear	Clothing shop	No
Donlua Africa	Namibian music sales	Yes
LEFA	Ride-haling	No
Exclusive Africa	Tour operator	Yes
Buddy Mobile Payment Application	Online marketplace	Yes
PayToday Mobile Application	Tickets, Accomodation and PSP & P2B payment services	Yes

Source: Bank of Namibia

(c) Strengths and weaknesses in digital platforms/services

Strengths/Opportunities

45. **Digital platforms can serve people, businesses, and government agencies in all aspects of life, including in healthcare, education, commerce, transportation, and other public benefits.** For the value of these platforms to be maximized, they must be able to share critical information through an interoperability framework. Assessing the enabling environment for the further development of platforms is critical to the overall understanding of digital economy in Namibia.

Weaknesses/Challenges

46. **Several challenges cited by the Government as obstacles in the effective implementation of e-Governance.** The Government cited the below as some of challenges faced in the implementation of e-Governance:
    - Redefining rules and procedures

- Legal issues (lack of e-law)
- Infrastructure (telecommunication and electricity)
- Access to right information
- Lack of trained human resources
- Lack of ICT penetration in remote areas
- Standardization and inter-operability

V. DIGITAL FINANCIAL SERVICES

47. Digital financial services (DFS) are a critical pillar in transitioning towards a digital economy. DFS are financial services such as payments, banking, credit, remittances, savings, securities, investments and insurance delivered through digital technologies and channels (World Bank, 2020). Digital financial services are mainly provided by banks and non-banking financial institutions. Financial services offered through digital means tend to be cheaper and more convenient for the users. DFS has been proven in various countries as a vehicle to drive financial inclusion. Creating access to financial services to the unbanked and underbanked population through digital means increases economic activity as well as the realization of a digital economy. Government as a key service provider in the economy can leverage DFS to enhance revenue collection and government spending with more speed and efficiency.

48. DFS in Namibia can be assessed from a banking and non-banking perspective. Banks compete with non-bank financial institutions and FinTech companies in the provision of digital financial services. While the services are the same in most cases, the competition usually comes down to who can provide the financial service at a lower cost as well as access channels/points/platforms. In many cases, FinTech entities do not have to carry high regulatory and compliance costs that are incurred by banks and non-bank financial institutions (NBFIs) and are therefore in a better position to provide the same services at a lower cost. Additionally, FinTech companies are equally not bogged down by cumbersome legacy systems. They can easily scale their products, what is necessary for them to flourish and further take advantage in the provision of appropriate and innovative financial products is the access to Data.

Box article

Regulators: The two main regulators in the financial sector are the Bank of Namibia and the Namibia Financial Institutions Supervisory Authority (NAMFISA).

Banks: The banking sector in Namibia consists of four big banks (First National Bank, Standard Bank, NedBank, and Bank Windhoek) and four smaller banks; namely, Trustco Bank Namibia; Letshego Bank Namibia; Bank BIC Namibia Limited and Banco Privado Atlántico Namibia.

Non-bank financial institutions (NBFIs): Namibia Post Limited, Virtual Technology Service and Nam-mic Payment Solutions.

Automated Clearing House: NamClear is responsible for clearing financial transactions between banks through the card and EFT streams.

Real Time Gross Settlement System: The Namibia Interbank Settlement System (NISS) is responsible for settling financial transactions between banks.

Mobile Network Operators (MNOs): MNOs, namely MTC and TN Mobile facilitate wallet-based transactions and transfers through mobile wallets.

(a) Banking

49. The Namibian financial sector has grown since independence. The banking sector increased from four banks since the 90s to eight banks in 2021. The non-bank financial institutions have also grown over the years challenging the conventional banking models and providing competition in the provision of financial services. A lot of digital innovation has taken place in the banking sector, specifically (Bank of Namibia, 2020). The move towards providing financial services through digital platforms i.e. web applications, mobile applications and digital wallets have revolutionized public access to financial services. Compared to the 90s and early 2000s, the four big banks now offer online banking, mobile banking, and wallet services.

50. The use of electronic payment methods has been increasing over the years in Namibia. Payment cards remain the most used electronic payment method for retail transactions followed by electronic funds transfer (EFT) and e-money. Card payments are prominent on e-commerce platforms and point of sale (POS) devices at merchants. EFT payments remain integral in the National Payment System, mainly for corporate payments, debit orders and high value credit transfers. Electronic money in Namibia which is issued by both banks and non-banks has seen considerable growth over the years. Cheque as a payment instrument was discontinued in 2019 owing to the decline in usage and the cost of maintaining the cheque processing infrastructure.

51. **A lot of digital innovation has taken place in the payments space.** The emergence of payment service providers to provide payment services to banks, merchants and consumers have provided users alternate options of accessing financial services. Mobile applications such as PayToday and Buddy provide alternate ways of making payments and sending money. Gateway payment service providers such as DPO and WireCard provide merchants the ability to accept online payments. Banks such as Standard Bank and Nedbank have acquired their own gateways to enable e-commerce merchants. All this has led to a considerable number of e-commerce platforms in Namibia, mainly in the tourism and hospitality sector.

52. **From a banking perspective, numerous financial innovations have been embraced over the year, such as**

- Chip and pin on bank payment cards replacing magstripe,
- The Tap and Pay functionality
- Card-less withdrawals at ATMs
- Cash back services at Merchants
- The ability to deposit at ATMs
- Cash withdrawals at retail outlets
- 2 factor authentication at e-commerce platforms
- Tokenization and QR Codes

(b) Payment systems infrastructure

53. **Prior to independence, Namibia depended heavily on South Africa's payment infrastructure for clearing and settlement of most payment instrument including card transactions.** The dependency on South Africa made Namibia's financial system vulnerable to risks that would affect South Africa's payment system and placed oversight functions of critical payment system infrastructure in the hands of the South African regulators. The Bankers Association of Namibia (BAN) representing all commercial banks in Namibia and delegated by the Bank of Namibia initiated a National Payment Reform Project (Reform Project), which was launched in 2001, whereby key objectives were identified to disconnect the inter-bank transactions from the South African National

Payment System and to address the above-mentioned dependencies and vulnerabilities[13].

54. **Given the Reform Project objectives, Namibia achieved key milestones in revolutionising the domestic financial sector.** Starting with the implementation of the Real-Time Gross Settlement System (RTGS) referred to as the Namibia Inter-Bank Settlement System (NISS) in 2002; the promulgation of the Payment System Management Act, 2003 (Act No.18 of 2003) as amended (the PSM Act); the establishment of NamClear Limited (the domestic clearing house) in 2003; the Electronic Fund Transfer System (EFT) in 2004; the Cheque Processing System (CPS) in 2005; the establishment of the Payments Association of Namibia (PAN) in 2005 and the domestic card switch (Namswitch) in 2008, inter alia[14]. The highlighted milestones significantly assisted with separating Namibia's NPS from that of South Africa.

55. **FinTech services in Namibia are predominantly provided in the payment space.** The payment system landscape has undergone significant transformation over the past years. Banks and non-banks have invested substantially in FinTech to provide interoperable payment services and seamless integrations with payment service providers through APIs. The introduction of mobile payment applications such as PayPulse, PayToday and Buddy allow users to make P2P (Peer to Peer) and Person-to-Business (P2B) payments without requiring the recipients bank account or mobile number (Bank of Namibia, 2021). The implementation of contactless payments or QR codes by some banks have shown that traditional financial institutions are embracing FinTech innovations to remain relevant in the payments sphere. Similarly, cloud computing services are used for administrative functions like email services, since data is deemed less risky for cloud storage.

56. **A Central Securities Depository (CSD) system is a key component of a modern financial infrastructure.** A CSD is a specialized financial organization holding securities such as shares, government stocks, etc., either in certificated or uncertificated (dematerialized) form so that ownership can easily be traced and transferred through a book entry, rather than the transfer of physical certificates. Applied to government securities, such a book-entry system, it becomes an important tool in the hands of the

[13] https://www.sadcbankers.org/subcommittees/PaySystem/media/Documents/Newsletters/Vulindlela_Oct2010/Namibia_article.pdf
[14] https://www.bon.com.na/CMSTemplates/Bon/Files/bon.com.na/9d/9d223e59-9e94-4f94-8c20-44b11ce4bb2b.pdf

central bank to administer the issuing of government securities and central bank instruments and to support credit extension in the RTGS against eligible collateral the management of securities. The establishment of a single national Central Securities Depository (CSD) is a vision embodied in the Namibia Financial Sector Strategy (NFSS), which seeks to reform the financial system to attract investors into the Namibian economy and to have an active capital market characterized by higher turnover, liquidity and immediacy. Provisions for regulation of the CSD is in the recently Promulgated Financial Institutions and Markets Act, 2021. Equally important is the Government's drive to encourage the development of modern national financial market infrastructures in line with the nation's vision 2030 aspirations.

(c) Non-Bank Financial Institutions

57. The number of non-bank financial institutions in the financial sector has risen and more digital financial services are now accessible in the space of credit, insurance, investments etc. The scale and scope of digitization in Namibia is significant in certain types of technology, such as distributed ledger technology, big data, internet of things, artificial intelligence and biometric technology.

Table 5: Types of Digital Technology used by NBFIs

Non-Bank Financial Institute	Type of Digital Technology	Uses of Digital Technology
Capital Markets	Cloud Computing	for effective and efficient processing and storage of data. for advisory and agency services planning, investment and trading, financial market, cyber security and communication
Insurance	Cloud Computing	for effective and efficient processing and storage data.
	Artificial Intelligence	interpretation of historical data for easy of communicating to existing clients.
	Distributed Ledger Technology	creation, secured transfer and storage of policyholder information
	Internet of Things (IoT)	capturing information of movable objects in the physical world.
Pension	Distributed ledger technology, big data, internet of things, cloud computing, biometric technology	for pension funds, payment services, investment and trading and operations

Microlending	Distributed ledger technology, big data, internet of things, artificial intelligence and biometric technology	lending and funding, credit, operations and communications
	Robotics technology	for payment services, lending and funding and operations
	3rd party Avril Payment solution	for credit

Source: NAMFISA

(d) Strengths and weaknesses in digital financial services

Strengths/Opportunities

58. FinTech innovations such as crowdfunding, P2P lending, amongst others, are not yet prevalent in Namibia. An enabling regulatory environment to foster more FinTech services is needed for the financial sector and the economy to realize the FinTech benefits. The Bank's efforts of recently introducing a FinTech Regulatory Framework will greatly assist with attracting FinTech innovations.

Weaknesses/Challenges

59. One of the biggest problems with Namibia's e-money service is the lack of interoperability as the e-money service remains closed-loop. This limits users to specific money issuers and schemes and does not provide flexibility and options to users. Due to the limited options, users are at times left with no choice but to travel long distances. This contributes to exclusion as the cost of accessing such service providers are high.

60. The costs involved in the FinTech applications in Namibia are high. The costs of doing business in Namibia remains high as it requires a lot of time and money for new businesses to setup in Namibia. Innovators invest a lot of money in building applications and would therefore expect healthy returns on their investment. This may lead to situations whereby much needed FinTech solutions are not deployed in Namibia caused by low value propositions to the innovators due to scalability and low volumes that might actually use the innovation. Venture capitalism and crowdfunding are some of the practical solutions that can resolve challenges that face innovators in developing much needed applications but are concerned from a commercial perspective.

VI. REGULATORY AND POLICY ENVIRONMENT

61. **The Namibian communications sector is governed by the Communications Act, 2009 (Act No. 8, 2009).** The Act provides for the regulation of telecommunications services and networks, broadcasting, postal services and the use and allocation of radio spectrum. An independent Communications Regulatory Authority of Namibia (CRAN) was established for this purpose and to make provision for its powers and functions; the granting of special rights to telecommunications licensees; the creation of an Association to manage the *.na* internet domain name space and for matters connected therewith. The Act was further amended to the Communications Amendment Act, 2020 (Act No. 6, 2020). The proposed amendments aim to address the key provisions as listed below:
    - to improve the effectiveness of the regulatory framework;
    - to improve the operational efficiency of CRAN;
    - to deal with Regulatory offences
    - to foster a more effective and efficient enforcement framework; and
    - to remove provisions that are no longer necessary.

    The Electronic Transactions Act 4 of 2019, was also introduced to provide for a general framework for the promotion of the use of electronic transactions in the country. The act is further aimed to provide for the legal recognition of electronic transactions; to provide for the admission of electronic evidence; to provide for consumer protection in electronic commerce; as well as to regulate the liability of service providers for actions of their clients and to provide for matters of incidental thereto.

(a) The Role of The Central Bank

62. **The changing world and particularly digitization within financial services, requires the central bank and other regulators to rethink and restructure their approaches to regulation.** Central banks now more than ever are expected to encourage innovation, drive efficiency, adopt new technologies and agile operating models, drive the workforce of the future, whilst still providing uncompromised regulatory services. Central banks play a pivotal role in maintaining the safety and integrity of the payment system (BIS, 2020). They provide the solid foundation by acting as guardians of the stability of money and payments. The pandemic and resulting strain on economic activity around the world have confirmed the importance of central banks in payments. Central banks are

embracing this innovation as they promote interoperability, support competition and innovation, and operate public infrastructures. This are all essential for easily accessible, low-cost, and high-quality payment services (BIS, 2020).

63. **The Bank of Namibia is a prudential regulator in three main areas namely, Banking, Payment Systems and Exchange Control.** Recently, the Bank of Namibia also added Credit Bureaus to its regulatory Framework. The Bank of Namibia therefore has 3 prudential regulators in the form of Banking Supervision Department, Payment and Settlement System Department and EXCON and Legal Services Department. The Bank of Namibia Act, 2020 (Act No. 1 of 2020) empowers the Bank of Namibia, to serve as the State's principal instrument to control money supply, currency and institutions of finance in Namibia. The act further empowers the Bank to provide for the functions of the central bank and to provide for its management; to regulate the issue of banknotes and coins; to provide for matters relating to banking, currencies and monetary policy; to manage foreign exchange reserves; to promote financial stability; and to provide for incidental matters.

64. **The Bank of Namibia as a regulator has laws and regulations that enable banks and non-bank to provide digital financial services.** The Banking Institutions Act of 1998 (Act No. 2 of 1998), as amended, enables the Bank of Namibia to authorise banking institutions to conduct banking business which includes providing merchant accounts and financial services to entities in Namibia (Bank of Namibia, 2020). The Payment System Management Act of 2003 (Act No.18 of 2003), as amended (the PSM Act), enables authorised banks and non-banks to provide payment services and issue payment instruments in Namibia. In order for digital transformation to flourish in Namibia, laws and regulations applied to banks should be flexible enough to accommodate the digital agendas of banks. The regulator should therefore find a balance between effective regulation and creating an enabling environment for innovation to prosper. Another key financial sector regulator is the Financial Intelligence Centre (FIC) for Anti-Money laundering (AML) and Countering the Financing of Terrorism (CTF) regulations.

65. **NAMFISA as a regulator also has laws and regulations to ensure that the non-bank financial sector is digitally transformed.** NAMFISA is responsible for regulating capital markets, the insurance sector, pension funds and microlending as empowered by the Namibia Financial Institutions Supervisory Authority Act, 2001 (Act No. 3 of 2001) and amended in 2021. Ensuring that all these sectors have some form of digital platforms,

will assist the transition to a digital economy. The recently launched Financial Institutions and Markets Act, 2021 (Act No. 2, 2021) enables NAMFISA to consolidate and harmonise the laws regulating financial institutions, financial intermediaries and financial markets in Namibia; and to provide for incidental matters.

(b) The Digital Policy

66. **A well-defined policy direction and the ability to design national strategies and execute them are key to developing an enabling environment for the digital economy.** The Namibian Government's Vision 2030 document stipulates that ICT must be the most important sector in the economic development of the country by 2030. An Information, Communication and Technology Policy was implemented in 2004 which was later improved in 2008.

67. **An eight-member task force to assist the government in preparing for the Fourth Industrial Revolution (4IR) was appointed in July 2021.** President Hage Geingob appointed an 8-member task force which will conduct a country assessment to determine the readiness of Namibia for 4IR and make recommendations towards a co-ordinated and coherent policy and legislative framework. The 4IR task force is currently in the process of drafting a National Digital Strategy for the Republic of Namibia, which is at an advanced. Some groundwork was done in 2019 and a Concept Note was drafted which was approved by Cabinet in 2020.

68. **The current National Policy on Research, Science and Technology (NRST) was adopted in 1999 and contains explicit policy measures for the promotion and governing of scientific and technological development.** The NRST Policy of 1999 led to the promulgation of the Research, Science and Technology Act, 2004 (Act No. 23 of 2004) and the establishment of the National Commission on Research, Science and Technology (NCRST). The 1999 NRST Policy initiated (1) developments such as improved coordination, monitoring and supervision of research activities in the country; (2) the development of a national research programme which sets out priority research areas for Namibia; (3) institutional and human capacity development, and (4) dedicated funding for research, science and technology application and development in Namibia.

69. **The approval of the digital strategy by Cabinet has propelled Namibia to becoming an informed society with a knowledge-based economy.** The Ministry of Information

and Communication Technology has indicated that the review of various information and communication technology policies and their possible consolidation into a uniform national ICT policy is on the cards, such as the Electronic Transaction and Cyber-Crime Act (Bill), that will deal directly with cybercrime, cybersecurity, or data privacy.

(c) Strengths and weaknesses in the regulatory and policy environment

Strengths/Opportunities

70. **There might be uncertainties and unpredictability's of the regulatory landscape.** Over the coming decades, deep structural economic change is inevitable in Namibia, whether due to endogenous or exogenous influences. Regulators must confront, rather than shy away from, the complexity enshrined in the digital future.

71. **The central bank, from the perspective of banking supervision and financial stability must keep an eye on the developments in digital transformation and the potential risks they may create.** The Bank of Namibia has an opportunity to get ahead of digital transformation and ensure that risks are mitigated before they happen to effectivity fulfil its mandate.

Weaknesses/Challenges

72. **A notable challenge is the lack of a level playing field between regulated and non-regulated entities in the provision of financial services.** Non-regulated entities have a huge cost advantage above regulated entities. Regulated entities are also at times restricted in terms of what they can offer, which limits their innovation and competitive edge.

73. **The research, science, technology and innovation sector is confronted with various challenges:**

    i) limited scientific and technological human and institutional capacity;

    ii) limited investment in Research and Development (R&D);

    iii) limited private sector/industry participation in R&D;

    iv) a weak entrepreneurial and innovation culture;

    v) weak linkages between universities, Research & Development (R&D) institutes and industry; and a

vi) lack of a well-defined information management system and a lack reliable statistics and STI indicators.

VII. CONCLUSION

74. **Based on the above assessment, Namibia has made great strides in digital transformation, especially in the banking and non-bank financial services.** The banking and financial institutions have made significant improvements in the digital spheres and have largely moved from cash transactions to more cashless transactions. Digitization is impressive in the non-banking sector, with the use of distributed ledger technology, internet of things, artificial intelligence and biometric technology to support operations and communications for lending and funding purposes.

75. **Digital infrastructure has also been improving with more and more towers set up in the country.** The country's access to the WACS cable puts the country at an advanced level of digital infrastructure. The expected second submarine fibre-optic internet cable in 2022, will further enhance the reliability of increased internet bandwidth for the country. High-quality and affordable broadband internet is a key foundation of the digital economy. It contributes to enhancing productivity, facilitating information exchange, and improving service delivery across economies. However, the lack of sufficient ICT infrastructure and electricity supply in rural areas will need to be addressed to eliminate inequalities between rural and urban areas.

76. **The country still has room for advancement in the digital platforms pillar.** Although the use of various mobile apps, AI applications, software-enabled platforms as well as e-commerce platforms in the country has a foothold, a lot still has to be done as e-commerce merchants and open data in the country are still at a lower level. Moreover, manual processes and the heavy reliance of cash to move goods and services creates a huge challenge towards aspirations of a digital economy. Furthermore, weaknesses raised in the various pillars need to be addressed.

VIII. POLICY RECOMMENDATIONS

77. **Namibia needs to expedite its digital platforms according to the aspirations of HPP2.** Digital technology offers potential for enhanced efficiency, transparency, and service delivery in the public sector, but the government's efforts in this field appear fragmented and slow moving. Some digital platforms implemented more than a decade ago are still not fully functional. There should be concerted efforts by the government to increase digitisation through clear and deliberate strategic objectives. Funds should be set aside targeted towards ICT development as most government projects have been halted due to a lack of funds.

78. **Expedite regulatory reforms necessary to fast-track digital transformation.** There is a need for laws to be amended and policies to be in place to ensure digital transformation in the country. It is thus important that the relevant policymakers ensure that these laws be promulgated in the short-to-medium term and the required policies be drafted and adopted accordingly.

79. **Promote infrastructure sharing to avoid the multiplicity of initiatives and redundancies in the deployment of infrastructure.** The Communications Act, 2009 (Act No. 8 of 2009) as amended in 2020, allows for infrastructure sharing in a non-discriminatory and allows for bilateral negotiations between the institutions. This means that more focused infrastructure sharing will enable further access as well as enable operators to focus on the competition in the service layer regardless of the extent of the sharing. Operators can share whole or strategically unimportant parts of its infrastructure to share infrastructure costs while providing acceptable performance. Furthermore, these savings can facilitate mobile operators' migration to next-generation technologies and provide its customers with the latest technology available.

80. **Strengthening infrastructure in ICT and electricity in rural areas to ensure digitalization is countrywide.** Intensive efforts must be made to ensure efficient electrification in the whole country. Furthermore, access to ICT connection should penetrate the whole country.

81. **Increase scientific and technological human and institutional capacity.** Namibia will not realize the full benefits of digital transformation, unless it ensures that learners going through the school system are equipped with foundational numeracy and literacy skills. There is also a need for overall digital literacy in the country.

82. **Access to affordable financial services is critical for poverty reduction and economic growth.** Countries with deeper, more developed financial systems enjoy higher economic growth and larger reductions in poverty and income inequality. Access to financial services also increases opportunities and resilience for the poor, particularly women and people in the rural areas.

83. **There is a need to accelerate data-sharing and drive business growth.** Data sharing, data exchanges, and data ecosystems are an essential goal for advancing in digital transformation. It is therefore essential that as a country we look at data-sharing.

84. **The paper tried to mirror similar studies that have been done by the World Bank on various countries.** The World Bank paper is extensive and provides great insights to the countries analyzed. This paper, however, could only look at the pillars on a high level due to its nature and it would be beneficial to invite the World Bank to do a similar study for Namibia.

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Annexure:

Figure 1: The evolution of payment systems over the years in Namibia

Source: Bank of Namibia

Table 1: Population coverage in Namibia

	Population Coverage %				Not covered				Total
Region	**2G**	**3G**	**4G**	**Broadband**	**2G**	**3G**	**4G**	**Broadband**	**Fibre**
Kunene	66	50	33	50	36,817	54,792	73,110	54,400	821
Omusati	99	97	82	97	1,865	9,069	48,504	7,479	384
Oshana	100	99	96	99	108	1,501	7,533	1,099	207
Ohangwena	99	94	90	96	2,298	17,305	26,486	12,260	199
Oshikoto	99	86	73	89	2,887	30,195	57,636	24,328	645
Kavango East	97	90	69	91	4,622	15,526	50,734	15,373	711
Zambezi	100	94	60	95	191	5,919	41,985	4,877	498
Erongo	98	96	92	96	4,461	9,671	17,616	9,640	2,164
Otjozondjupa	94	84	72	85	9,551	26,569	45,866	25,062	1,837
Omaheke	88	66	48	66	9,309	27,247	41,581	26,816	1,354
Khomas	99	97	96	98	6,826	12,142	17,447	11,545	1,904
Hardap	87	80	72	80	12,364	19,385	26,711	18,760	2,372
!Karas	89	83	73	83	9,912	15,252	24,113	14,943	3,044
Kavango West	94	74	40	77	5,818	23,724	55,271	21,518	385
Namibia	**96**	**89**	**79**	**90**	**107,029**	**268,297**	**534,593**	**248,100**	**16,525**

Source: CRAN

Table 2: Government services

Service	Use	Status
E-Government Procurement	EGP will replace the existing manual system of bid solicitation, evaluation, and contract management.	In the process of amending the act Training needed for staff
Electronic Document and Records Management System	Modernization of paper based and electronics records management practices to ensure compliance with the Archives Act	Very few staff that are rolling out the system
Integrated Health Care Information Management System	Known as E-Health system, is web-based, and covers all aspects of hospital management and day-to-day operations of hospitals.	The Ministry is busy with the tendering process
Civil registration and identification	All vital events were registered in physical civil registries (e.g., births, deaths) and handwritten certificates (birth, death, marriages, etc.) were issued for each.	e-death launched and used at Central and Katutura hospital and at Mortuaries.
ITAS Tax System	ITAS is an online system that provides taxpayers with 24/7 access to their tax accounts to execute various self-services such as new tax registration, filling tax returns, applying for tax refunds as well as reporting tax crimes amongst other.	Fully functional system
ASYCUDA	ASYCUDA is a computerized customs management system which covers most foreign trade procedures.	Fully functional system
e-Justice system	This is an electronic platform for filling, case management, and diarizing of court document within the ligation process.	The system is fully operational.
Forestry Produce Harvesting and Transport Permits Management System	The system for managing Forestry Produce Harvesting and Transport permits was completed and piloting is in progress.	The system will be delivered within this financial year, 2018/2019
Online Grade 10 and Grade 12 Candidates registration for	The system was developed and implemented. Staff have been	Other regions will be trained during 2018-2019 financial year.

Examination in selected secondary schools:	trained. User Acceptance testing and piloting training was done. Grade 10 and 12 exam registration training conducted in 17 schools in !Karas Region 26 September – 10 October 2017.	
Child Welfare Database System	The system is used to capture and store data about vulnerable children and gender base violence incidents related to children.	The system is operational
Online Visa and Permits Application	Business Process Reengineering (BPR) was completed. The system has been developed and installed. However, the system requires extra interfacing modules to be developed which will enable the system to interface with the public, this requires extra funds which is not available.	The ministry requires funds to create interface modules which will enable interfacing with the public.
Online Deeds Registration	The feasibility study was done. BPR (As-Is process) was done. BPR (To-Be process) not yet done pending international bechmarking. There is need to do benchmarking with two identified countries (Sweden and South Africa) to enable the team to identify a suitable model to base their To-Be process.	The current financial constraints is preventing the team from doing benchmarking.
Namibia Integrated Employment Information System	NIEIS is a system initiated by the Ministry of Labour, to collect, store and update information of job seekers. The system stores names, qualifications and occupations of job seekers; vacancies in the labour market; specialized skills and qualifications possessed by Namibian citizens and permanent residents and employers in Namibia	Fully functional system