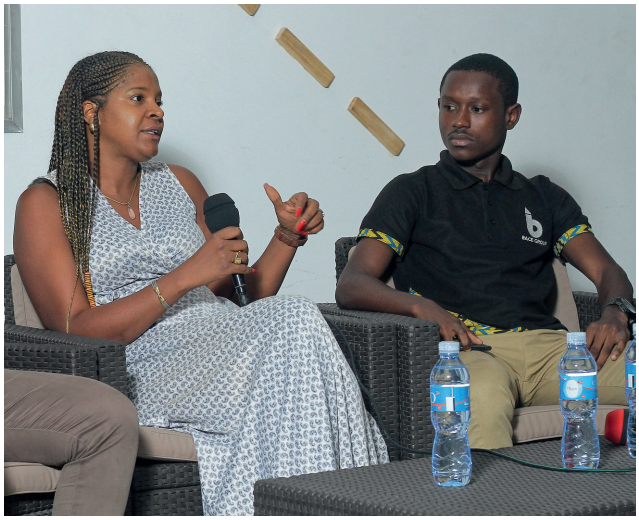
DIGITAL CONNECTIVITY AMONG MICRO, SMALL AND MEDIUM ENTERPRISES IN ZAMBIA

A CASE STUDY WITH A FOCUS ON LUSAKA



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About the paper

The digital divide is an ever present and growing issue in Africa. This paper explores the digital connectivity landscape as present in Zambia, with a particular focus on the connectivity challenges faced by MSMEs in Lusaka. Survey findings demonstrate a high dependency on mobile internet access, as well as a lack of internet utilisation for business websites and innovation purposes. Commonly cited challenges include skills deficits, cybersecurity risks, high costs, and knowledge gaps regarding applicable regulation. This paper recommends a suite of possible regulatory responses including the provision of fiscal incentives, skills development programmes, and infrastructure development.

This paper contains insights that could be used to inform policymaking in this area and are relevant for both Zambian and other African ICT businesses. This paper is also relevant for academics, entrepreneurs, ICT professionals, and other stakeholders with an interest in addressing Africa's digital divide.

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Milou van Bruggen (ITC) led the coordination of the report, with input from John Ndabarasa (ITC). The report was researched and written by Professors Bupe Simuchimba and Dale Mudenda from the University of Zambia, with inputs from Bernard Banda on behalf of the Zambia Information and Communications Technology Authority. Anne Kasong Yav and Kyle de Klerk (both ITC) edited the report.

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Executive Summary

This study, conducted by the International Trade Centre's *FastTrackTech Africa* in collaboration with the *Zambia Information and Communications Technology Authority (ZICTA)* and the University of Zambia, aimed to document Zambia's internet connectivity landscape among urban Micro Small and Medium Enterprises (MSMEs) in Lusaka. The study sought to highlight the extent of internet connectivity among MSMEs to identify the opportunities and barriers to the use of internet in informing potential policy interventions. Information gathering involved interviews with MSMEs as well as tech hubs, policy makers, and key experts.

This research uses survey evidence of MSMEs with internet connectivity, especially in Lusaka. Most of these MSMEs use mobile phone-based internet connectivity and portable devices like dongles or modems. MSMEs used the internet for a limited range of services that included advertising, market research and digital transactions. The majority of MSMEs did not have a website and rarely used internet services for product innovation.

Most of the MSMEs could not effectively use the internet for their business operations due to various risk factors and constraints including cyber security, lack of requisite skills, and the high cost of internet services. It was also established that the majority of the MSMEs in the study were not familiar with the legal and regulatory frameworks affecting the sector.

Based on the findings, the study recommends that government could consider designing a strategy that fosters the adoption of ICT and connectivity technology among MSMEs to enhance their productivity and resilience. Furthermore, targeted fiscal incentives could be provided to lower the cost of digital devices (such as smart phones) and facilitate access to more stable and faster fixed broadband connectivity. These services should be accompanied by complementary interventions such as skills development as well as education and awareness activities among MSMEs. The improvement in skills will not only improve capabilities for usage but also enhance safety during usage. MSMEs will also need to be linked to technology hubs as very few indicated that they were affiliated to any technology hub. These technology hubs can assist businesses to achieve greater efficiency in their operations and improve their growth and business capacities.

Acronyms

DRC	Democratic Republic of Congo
GDP	Gross Domestic Product
GNI	Gross National Income
ICTs	Information and Communication Technologies
ILO	International Labour Organisation
ITC	International Trade Centre
IXP	Internet exchange point
MCTI	Ministry of Commerce, Trade, and Industry
MSMED	Ministry of Small and Medium Enterprise Development
MSMEs	Micro, Small and Medium Enterprises
MTS	Ministry of Technology and Science
NTBC	National Technology Business Centre
UNCTAD	United Nations Conference on Trade and Development
UNZA	University of Zambia
WTO	World Trade Organization
ZDA	Zambia Development Agency
ZICTA	Zambia Information and Communications Technology Authority
ZSA	Zambia Statistical Agency

Unless otherwise specified, all references to dollars ($) are to United States dollars, and all references to tons are to metric tons.

Introduction

1.1 Background

The rapid technological changes observed over the past decades have made digital connectivity an important ingredient of competitiveness and profitability in many economies. Information and Communication Technologies (ICTs) are regarded as key drivers and enablers of economic development and growth in all economies including Zambia. Recent studies conducted during the COVID-19 pandemic have reinforced this view given the critical role played by ICTs in ensuring business survival and the management of the crisis.[1] Adoption of ICTs helps Micro, Small and Medium Enterprises (MSMEs) to reduce their trade costs by improving their networks, acquisition of information and access to finance.[2]

The COVID-19 pandemic has been one of the push factors in enhancing digital connectivity. In order to continue running a business, keeping in touch, learning, working or accessing other services, being digitally connected has become a necessity. Globally, internet uptake increased from 54% in 2019 to 63% in 2021.[3] This increase was more prominent in developing countries compared to developed countries. Developed countries enjoy almost universal internet usage of more than 90%, while developing countries currently have an internet usage rate of 57% but are making gradual progress in improving internet usage.[4]

Growth in digital connectivity has been complimented by an increase in digital entrepreneurship. In the past five years, Africa has experienced a tenfold increase in entrepreneurship ecosystems, through incubators, accelerators, and tech hubs.[5] These entrepreneurship support organisations offer various services ranging from start-up creation to tech-community builders. In an era where digital connectivity is growing, their role is of great importance. Their other functions revolve around building relationships and networks, boosting capabilities and serving as intermediaries.[6] New tech hubs continue to enter the market. Briter Bridges identifies 1031 active tech hubs in 2021.[7] This represents more than a 60 percent increase from the 643 identified in 2019.[8]

The application and use of digital technologies provide many benefits to economies in general and across a wide range of intra- and inter-firm business processes and transactions.[9] Using technology through digitisation generally improves operational efficiencies, leads to innovation, improves access to local and international markets and enhances the overall productivity and growth of firms. For MSMEs, innovations related to internet connectivity can lead to;

(i) Improved productivity

(ii) Accessing credit or funding

(iii) Creating high value jobs

(iv) Lower transaction costs

(v) Resilience to shocks

(vi) Enhancement of digital skills and acquisition of digital knowledge

Improved internet connectivity has the potential, in the long term, to bring returns through economic growth driven by improved productivity and able populations that create stronger digital economies with higher consuming spending power.

[1] Bagale et al., Small and medium-sized enterprises' contribution in digital technology, 2021.
[2] Tang and Konde, Differences in ICT use by entrepreneurial micro-firms: evidence from Zambia, 2020.
[3] International Telecommunications Union, *Measuring Digital Development: Facts and Figures, 202.1*

[4] ITU,2021

[5] World Bank, Accelerating Digital Transformation in Zambia: Digital Economy Diagnostic Report, 2020.
[6] ITC, Tech Entrepreneurship Ecosystem in Zambia: A network Analysis of Institutions Supporting Entrepreneurship, 2020.
[7] Briter Bridges, Bolstering Innovators in Africa, 2021
[8] Briter Bridges, Building a Conducive Setting for Innovators to Thrive, 2019
[9] Lukonga, Harnessing Digital Technologies to Promote SMEs and Inclusive Growth in the MENAP Region, 2020.

Ensuring affordability of access to reliable, fast, and secure networks as well as to devices and equipment is of utmost importance to guarantee long-term success of MSMEs and governance in general. Tech hubs can be instrumental in offering services and guidance that will assist MSMEs to scale.

Despite the observed importance of ICTs in business survival and viability, many MSMEs in developing countries lack access to appropriate ICTs, knowledge on how to use them effectively and innovatively.

The COVID-19 driven "lockdowns" put even more emphasis on the importance and role of digital connectivity. Large ICT companies and technology start-ups have facilitated business continuity and enhanced resilience to adverse shocks. In Zambia, for example, the ICT sector reported growth amidst the declines in all other sectors at the onset of the COVID-19 pandemic in 2020. The ICT sector grew by 14.3 % and contributed 0.7 percentage points to overall growth in 2020.[10]

For any economy to fully take advantage of ICTs, basic ingredients such as broadband internet connectivity must be in place. Connectivity is a critical input in the transition to the digital economy, skilled labour and consumers, and appropriate digital platforms (to connect with consumers and other providers and complementary services) as well as an enabling policy and regulatory environment.[11]

1.2 Review of Secondary Datasets Focusing on Internet Connectivity among MSMEs in Zambia

Despite the existence of literature on the state and nature of MSMEs as well as their activities in Zambia, there has been little data documenting the perceptions, challenges, and enablers of internet connectivity among MSMEs.

One of the few available surveys include the World Bank (2010) Business Survey that surveyed 105 MSMEs. This study focused on improving competitiveness and access to finance. Other World Bank surveys focusing on MSMEs are the enterprise surveys from 2007 to 2019. These surveys considered a wide array of challenges that firms face such as access to finance, informality, electricity supply disruptions, access to land, tax administration, and inadequately educated workforces. However, these surveys did not address the opportunities and challenges associated with internet connectivity.

The most recent and comprehensive information relating to access and usage of ICTs was undertaken by the Zambia Information and Communications Technology Authority (ZICTA) in 2018 but had a narrow focus on households and individuals. Despite not focusing on MSMEs, the survey provided insight on connectivity. For example, the main challenges cited by households in utilising internet services were the slow rate of response in resolving internet connectivity problems and the low internet speeds offered by service providers. The identified barriers to increased uptake of internet services by households were a lack of IT skills, the cost of devices, and the service offers on the market. As for individuals, 70% attributed a lack of knowledge on how to use the internet as a contributing factor to their failure to do so. Other barriers cited were a lack of appropriate devices, a lack of interest in ICT services, and a lack of access to ICT services. These same barriers are likely encountered by some MSMEs and hamper their ability to adopt internet connectivity.

The International Trade Centre (ITC) also undertook two key studies. In 2018, ITC in

[10] Bank of Zambia, Annual Report, 2021.

[11] Ministry of Technology and Science and UNCDF, Zambia Inclusive Digital Economy Status Report, 2022.

partnership with the Ministry of Commerce, Trade and Industry (MCTI), Zambia Development Agency (ZDA) and Zambia Statistical Agency (ZSA) (then Central Statistical Office) carried out a survey that examined the factors that were affecting MSMEs from scaling up and entering the international markets. The other study by ITC focused on an ecosystem mapping of tech entrepreneurship in Zambia in 2020. This study mapped the Zambian ecosystem and offered an analysis of the institutions supporting entrepreneurs at different stages of the business lifecycle. Most support provided by business organizations are in the early stages of entrepreneurship. The report also looked at the connections that exist in the ecosystem and factors that affect these connections. It also highlighted challenges that tech hubs face in their support towards entrepreneurs, such as a lack of international mentors, few programmes available to scale MSMEs beyond the Zambian market and training for more mature start-ups, as well as a lack of funding opportunities for start-ups. Lastly, the study notes that the ecosystem would benefit if there was more collaboration and alignment among the different institutions providing support services to entrepreneurs.

Nevertheless, there is not publicly available empirical study that provides insights into the challenges related to access and usage of the internet among MSMEs in Zambia. Therefore, this current study was set up and facilitated by the ITC's FastTrackTech Africa Initiative in collaboration with the ZICTA and the University of Zambia (UNZA), to document the internet connectivity landscape of urban MSMEs in Lusaka.

The study aims to highlight the current post pandemic digital connectivity landscape, inform the potential design of policies, and ensure the effective implementation of strategy responses to promote the growth and development of MSMEs through increased internet connectivity. The study was specifically designed to pursue the following objectives:

i. To provide information on the importance and role of digital connectivity for MSMEs and ecosystem enablers such as tech hubs particularly in the post-COVID context.

ii. To highlight the barriers and enablers of increased adoption of digital connectivity among MSMEs.

iii. To profile the digital connectivity infrastructure in the country and vital support systems.

iv. To provide recommendations on how to improve digital connectivity among MSMEs in Zambia

The study used desk-based research complemented by interviews and surveys with selected MSMEs as well as tech hubs, government ministries, MTS, MSMED and an internet service provider. The first stage involved a comprehensive review of a broad-spectrum research by scholars, governments, and international organizations such as the World Bank and the United Nations. The literature review covered the status of digital connectivity, existing opportunities, enablers, and challenges faced by MSMEs.

The evidence gathered from the literature review provided insights into the structure and ecosystem of the ICT sector in Zambia. It also informed the design of the primary data collection instruments and policy interventions recommendations.

The study was not without limitations. The MSMEs interviewed were drawn from Lusaka, which is a developed and better networked city than rural towns. Thus, the results presented in the report are not representative of all MSMEs in Zambia. Although this limits the extent to which the findings can be generalised, it provides insight into the role of digital connectivity with regards to urban MSMEs in Zambia.

II. Zambia's digital connectivity ecosystem

Digital infrastructure plays a key role in the digital economy. Enhanced broadband usage alone contributes positively to growth, employment, and poverty reduction.

To achieve this aspiration, the government has recognised the need for the implementation of ICT related policies and strategies to improve digital connectivity and communication. To this end, the government has identified the need to partner with the private sector and invest in infrastructure not only in the ICT sector but also other key areas such as energy to grow the digital economy.

Zambia's Policy and Regulatory Framework for an Inclusive Digital Economy

To ensure that the digital economy has an enabling environment to grow, the government has established the MTS which has been working with other institutions to strengthen the ICT sector.

Apart from this, key institutions such as the Ministry of Finance and National Planning, ZICTA, the Bank of Zambia, and the Smart Zambia Institute have been active in promoting various elements of the digital economy. Initiatives such as digitising payments for the National Social Cash transfer program, identifying ICT as a key pillar in national development planning, implementation of the National Financial Switch and the goal to achieve a cashless society by 2030 have contributed to a fairly high score of 59% on policy and regulations in the Inclusive Digital Economy Scorecard.[12]

The policy and regulations governing the ICT sector provide a foundation that can improve the digital economy. The following areas have been prioritized;[13]

(i) Security and integrity through the implementation of policies such as the Cyber Security and Cyber Crime Act of 2021, adopting policies that improve consumer and data protection.

(ii) Policy development and regulatory harmonization through the promotion of collaboration among various stakeholders to deal with the challenges that hinder the development of an inclusive digital ecosystem.

(iii) Encouraging the use of digital IDs when accessing goods and services.

(iv) Innovation through the development of innovation hubs and provision of support to existing hubs

(v) Developing digital skills and strong linkages between various firms in the industry and academic institutions.

[12] Ministry of Technology and Science and UNCDF, Zambia Inclusive Digital Economy Status Report, 2022.

[13] MTS and UNCDF, 2022.

(vi) Improving customer awareness and capabilities on the benefits of digitalization, risks, and self-protection.

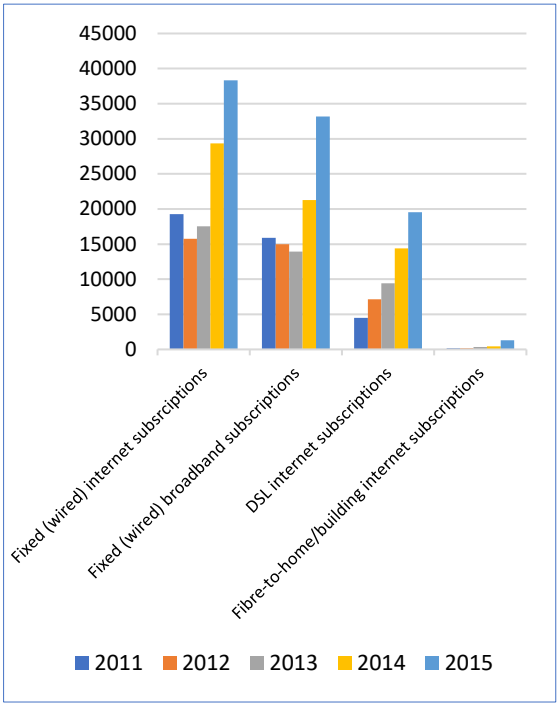


Figure 1: Internet Subscription by Type of Network

Source: Compilation from statistics provided by ZICTA (http://onlinesystems.zicta.zm)

Digital Infrastructure in Zambia: Internet Access and Usage

Internet usage and adoption has experienced a positive trend in Zambia. In 2020, the internet penetration rate increased to 57.6% from 52.8% in 2019 through the addition of 10.4 million new subscriptions.[14] Internet service providers offering various services have contributed positively to internet uptake by individuals. This has been through high investments among service providers, increased roll out of networked devices such as Point of Sale machines, and increased adoption due to the COVID-19 pandemic.[15] Despite this increase, Zambia still lags other developing countries in terms of internet penetration. In 2020, internet usage in developing countries grew on average by 13.3 %versus 11.8% in Zambia.[16]

There are still barriers to the uptake of broadband services such as low smartphone penetration rates estimated at 29.6 %.[17] Individuals who took part in the ZICTA 2018 survey cited a lack of appropriate devices and the cost of devices as determinate factors in their lack of adoption and usage of internet.[18]

Nevertheless, mobile internet subscription has gained dominance compared to fixed internet subscriptions. During the period 2011 and 2015, fixed wired internet subscription was greater than the subscription for Digital Subscriber Line (DSL), fixed wired broadband and fibre networks as shown in Figure 1.

Overtime, there has been substantial gains in subscriptions to fixed wired broadband and fibre networks. In 2015, subscriptions to fixed wired broadband increased by 56% while those to fibre network increased by 201%.[19] The subscriptions to fibre network increased to 1,308 from 435 subscriptions in 2014. This huge increase was attributed to investment in fibre infrastructure.

In Zambia, mobile internet subscriptions continue to be the most used consisting of 99% of internet subscriptions,[20] MSMEs included. Mobile internet services are easier to access with a relatively lower cost compared to fixed internet services.[21]

Network infrastructure

From the supply side, Zambia has both publicly and privately owned data centres. These data centres facilitate the local hosting of data. One of the latest state-owned data centres is state-of-the-art and offers secure data storage and management facilities.

[14] ZICTA, Market Report, 2022.
[15] MOF, 2021.
[16] ITU, 2021.
[17] ZICTA, 2022.
[18] ZICTA survey, 2018.
[19] ZICTA, 2015
[20] ZICTA, 2022.
[21] Ibid.

Zambia also has made significant investments in digital infrastructure especially in fibre and telecommunication towers. Currently, all the 10 provinces are linked to fibre. Of the 118 districts, 76 are connected through a high-speed broadband connection.[22] There are over 20,000 km of fibre cables laid across the country. The country also has interconnection links through Angola, Botswana, Democratic Republic of Congo, Namibia, Tanzania, Malawi, and Zimbabwe.

Despite the improved coverage of fibre, challenges still arise due to fibre cuts, electricity grid failures, and maintenance issues. Furthermore, the cost of data through fibre continues to be relatively high when compared to mobile internet services that are a close substitute. Fibre routes are duplicated for corporate clients to ensure that they have continuous internet connectivity. However, this pushes up the cost of national data connectivity.[23]

Infrastructure developments such as increased communication towers have enhanced the mobile network coverage. Population coverage for GSM networks is currently at 92%. By the end of 2021, there were a total of 3,147 towers spread across the country. The country also had 11,478 telecommunication sites in 2021.[24] The largest proportion of these sites continued to be 2G sites accounting for 39.7% followed by 3G sites at 31.9%. Only 28.4% of the telecommunication sites were 4G/LTE sites. To increase access to broadband connectivity, the proportion of sites that are either 3G or 4G will need to continue increasing.

Cost of Internet and Quality

Internet Service Providers face high costs arising from the fees charged by tower companies for the termination of fibre. This has been compounded by the dominant position held by the owners of this essential infrastructure.[25] The high cost translates into high internet charges to the end user.

The cost of internet for the end user considers various factors including:

- The tax framework, such as the corporate tax on the firms in the ICT sector and taxes on imported inputs such as cables and digital devices.
- The regulations in place and the market structure prevailing in a country's ICT sector. Most countries that have put in place regulations that favour their ICT sector have experienced a decline in the cost of internet[26].
- The size of the customer base has a bearing on whether service providers will provide internet to an area. Sparsely populated areas such as rural areas require better incentives for the providers if they are to provide internet.
- The number of competitors in the market influence the cost of internet. Many service providers will encourage technological innovations to meet demand and reduce the price of internet.

Operators also consider the potential for making profits and therefore avoid poor regions and areas that require extensive infrastructure investments due to geographical barriers.[27] These barriers can increase the cost of installing and maintenance.

For a landlocked country like Zambia, one of the biggest challenges that affect the cost of internet is access to international communication infrastructure. In addition, the tax framework applied to the ICT sector have raised prices, for example the excise duty on airtime stands at 17.5%.

A regional benchmarking of the price of data was carried out to determine the

[22] National Assembly of Zambia, *Report for the Committee on Media, Information and Communication Technologies, 2020.*
[23] World Bank, *2020.*
[24] Ministry of Finance, 2021.
[25] World Bank, *2020.*
[26] Robb and Paelo, Competitive Dynamics of Telecommunications Market in South Africa, Tanzania, Zambia and Zimbabwe, 2020
[27] Panos London, ICTs and development in Zambia; Challenges and opportunities, 2010

competitiveness of internet services in the country.[28] Zambia ranked 6th with regards to pricing of a monthly data bundle comparing to fourteen other countries, indicating scope for improvement in affordability.

Table 1: Regional Benchmarking of Data Pricing

Country	Price 2GB Data Monthly Validity (USD)	Rank
DR Congo	0.285785	1
Rwanda	2.367684	2
Kenya	2.585445	3
Nigeria	2.630298	4
Uganda	2.922581	5
Zambia	**3.060506**	**6**
Angola	3.798887	7
Tanzania	4.003418	8
Mozambique	4.394485	9
Madagascar	4.849162	10
Lesotho	8.402187	11
South Africa	9.751309	12
Eswatini	9.803922	13
Namibia	13.12958	14
Botswana	13.99472	15

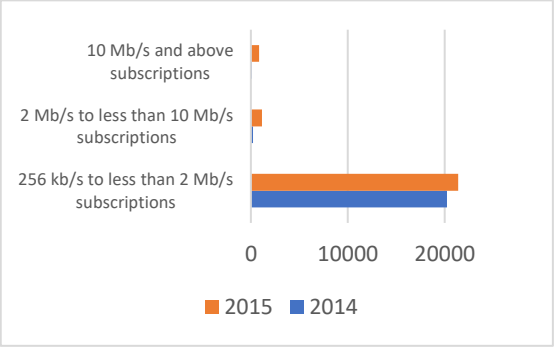
Source: ZICTA Market Report, 2022.

The Democratic Republic of Congo (DRC) has the lowest rate. In 2019, the country defined a digital development strategy for 2025 in hopes of improving access and usage of internet. Rwanda, which ranked second in providing low priced 2GB internet, has invested significantly in its ICT infrastructure. The government is pursuing a positively pro-digital approach to development.[29] In South Africa, the high price is associated with a lack of competition in the sector.[30]

In Zambia, internet data prices have been declining since 2017. This has been attributed to economies of scale experienced as Zambia was starting from a low base in terms of data volumes.[31] The sector is highly competitive and new entrants have played a role in pushing the price down especially in urban areas such as Lusaka. However, the price of data is still on the high side. It constitutes of 5% of Gross National Income (GNI) which is above the United Nation's definition of affordable internet as 2% of GNI.[32]

The price of 2GB data presented in table 1 does not consider the quality of service which is best captured by the speed of internet and stability. Data services in other African countries like South Africa, although expensive, operate with much higher speeds. In 2021 the average download speed in South Africa was around 19.94 Mbps compared with around 5.48 Mbps in Zambia. On average, the download speed in Sub-Saharan Africa was measured at 5.74 Mbps.[33] Most internet subscriptions in Zambia use a speed of 256 kb/s to less than 2 mb/s. This can be seen in Figure 3. The gap between high speed and low speed, although wide, has been declining. In 2015, 10 mb/s subscriptions and above increased to 847 from 82 subscribers in 2014.[34]

Figure 2: Internet Subscription by speed



Source: Compilation from statistics provided by ZICTA (http://onlinesystems.zicta.zm)

In efforts to attain lower data prices, the country has an internet exchange point (IXP) which is operated by the internet service providers association. However, the IXP has not been very successful in reducing data prices in the country. Some internet service providers do not route their

[28] ZICTA, 2022
[29] Liquid Telecom, African Digital Skills, 2019
[30] Robb and Paelo, 2020
[31] Ibid
[32] ZICTA, 2022.
[33] Dokua Sasu, 2021
[34] ZICTA, (http://onlinesystems.zicta.zm)

traffic through the IXP and the state of the infrastructure still requires technological improvement.

Support and Complimentary Services

Digital infrastructure continues to develop as both the private and public sector invest in its improvements. However, if these improvements are to have a positive impact, vital support systems such as electricity supply need to undergo improvement. Electricity supply faces challenges in terms of stability, meeting demand and low access.[35]

In 2020, services that relied on internet connectivity increased such as the use of electronic and mobile platforms to make payments, sending and receiving funds. For example, there was a 35% increase in mobile money transactions in 2020. The number of mobile money transactions increased from 747 million at the end of 2020 to 834 million at the end of 2021, an increase of 11.74 percent.[36] Similarly, the value of mobile money transactions more than doubled from ZMW 49.6 billion at the end of 2019 to ZMW 105.6 billion at the end of 2020, reflecting an increase of 113.07 %.

> ***Develop and invest in infrastructure and critical skills to achieve an information and knowledge-based society by 2030. -Vision 2030***

III. Opportunities and Challenges of the Zambian digital connectivity for MSMEs

MSMEs play a key role in the Zambian economy through their contribution to Gross Domestic Product (GDP) and employment of approximately 70% and 88%, respectively.[37] Over 90% of these MSMEs operate in the informal sector and over 52% are based in rural areas.[38]

49% of MSMEs engage in trading activities, mainly in consumable products, industrial products and agricultural inputs and produce. The second main activity that MSMEs engage in is simple manufacturing which includes textile products, wood products, light engineering and metal fabrication, food processing, leather products, handicrafts, and ceramics, etc. Services account for 10% of MSME activity and include doing business in restaurants, hair salons and barbershops, passenger and goods transport, simple building construction, telecommunication services, business centre services and cleaning services.[39]

MSMEs are key to attaining the Sustainable Development Goals, which were launched by the United Nations in 2015 as “a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.” They are a useful source of income and employment for the general population and make important contributions to reducing poverty and inequality as well as improving other social outcomes.

The current government, in recognition of the role that MSMEs play in the economy have set up the Ministry of Small Medium Enterprise Development. The ministry’s mandate is implementing policies and

[35] ITC, 2020.
[36] ZICTA, 2022.
[37] Zambia Invest, Zambia to Set Entrepreneurial Fund for SMEs, February 2017.
[38] Ministry of Commerce, Trade and Industry, Micro, Small and Medium Enterprises Development Policy, 2008.
[39] Ibid.

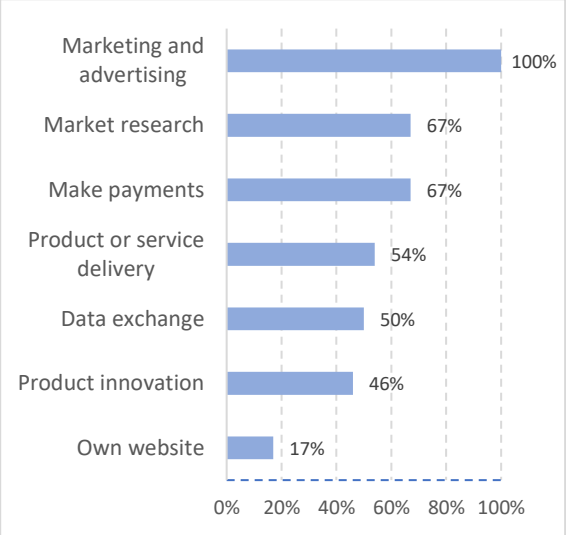
strategies that target MSMEs. These policies and strategies are expected to centre around the development, growth, and continued survival of these businesses.

MSMEs have steadily adopted internet connectivity in their operations due to the many benefits it provides. Given that most Zambian MSMEs are owned by youth that easily adapt to technological progress, the usage of internet by these MSMEs is bound to increase. The adoption and usage of ICT and internet connectivity for social networking is beneficial and important for communication, information and market access that increases the productivity of the businesses.[40]

The few studies[41] that have considered internet connectivity among MSMEs in Zambia have highlighted factors such as ease in communication, increased access to information, improved market access, social networking and cheaper means of advertising and marketing of products as being enablers in the adoption of digital connectivity. Most micro sized firms use internet for information and networking access, online transactions, and interactions as well as in house operations. Recently, in order to continue operating during the COVID-19 pandemic, most MSMEs have had to digitally connect. Unsurprisingly, this study discovered that the pandemic significantly increased internet usage by MSMEs with 88% of the survey respondents stating that their usage of the internet had increased within a range of 25% to 50%.

The increase was expected as businesses relied on virtual interactions to minimize the spread of the COVID-19 virus. Moreover, to survive, most businesses increased their online advertising and marketing efforts to reach a wider customer base.

Figure 3: Internet Usage by MSMEs in Lusaka urban



Source: ITC Survey Data

All MSMEs in this study used the internet for marketing and advertising. As stated earlier, most MSMEs used social media platforms to share information and engage with their customers as well as market their products. 67% used the internet to carry out research on their products or services, their potential competitors, and consumer demands.

In line with these findings, Guerriero looked at the impact of internet connectivity in Sub-Saharan Africa and discovered that most MSMEs utilized internet because it increased access to information and their ability to communicate both internally and externally.[42]

Tang and Konde (2019) considered specific ICT usages by micro sized firms in Zambia. The study discovered that ICT usage by micro sized firms was mainly for information and networking access, online transactions and interactions, as well as in house operations. Digital connectivity has increased social networking among MSMEs. Mwila and Ngoyi (2019) looked at the drivers of ICT usage among MSMEs in Zambia and found that these drivers include the ability to conduct business in a

[40] ILO, 2021.
[41] Mwila and Ngoyi, 2019; Tang and Konde, 2019.
[42] Guerriero,2015

growing technological environment, affordable advertising on social media platforms and cost saving.

The impact of Digital connectivity on MSMEs growth

The increasing availability of technology and digital infrastructure has opened new opportunities for sustained growth and innovation among businesses, especially MSMEs. With the improved internet connectivity, markets have in some cases become more interconnected and digital products and services have increased around the world. There are various opportunities that MSMEs derive from adopting and utilizing the internet.

Relying on the work of Dalberg (2013), Guerriero[43] points out 6 benefits of internet connectivity on SMEs growth. Among them is the access to a broader pool of clients and consumers, the lowering of communication and transactions costs, an improved and cheaper platform for marketing and advertising, the opportunity given by the great numbers of Social Media users, the prospect for direct online sales and finally the opportunity of business creation.

UNCTAD (2017) explained that MSMEs in services sectors such as hotels (tourism), sales affiliates or e-commerce logistics suppliers have expanded their businesses through internet enabled digital platforms.

Digital connectivity opens new pathways to conducting business by offering various new investment opportunities within local industries. Internet has allowed for innovation of business creation ideas and quicker diffusion of ideas and knowledge to new markets.

With increased innovation, internet services have been associated with a rise in digital transaction platforms. Businesses have also had to accept mobile payments partly due to the need to accommodate consumer preference. Technology has made it easier to carry out transactions by both the MSMEs and their clients. In this study, MSMEs estimated that, on average, 50% of their business transactions were made using the internet in 2020. In 2021, the number of business transactions carried out online increased by 5%. In 2020, services that relied on internet connectivity underwent a positive change as was observed through the increase in the use of electronic and mobile platforms to make payments, sending and receiving funds. This accounted for the 35% increase in mobile money transactions in 2020.[44]

In terms of product innovation, 46% of the MSMEs that participated in this study used the internet for innovation purposes. This could be attributed to the fact that most of these MSMEs engaged in activities that dealt with finished goods. Furthermore, only 17% of MSMEs owned or managed a website for their business. This mirror findings made by ZICTA's 2018 survey in which it appeared that few MSMEs had developed websites for their operations. The use of social media and digital financial platforms has reduced the need for websites for most businesses. Social media platforms allow MSMEs to expand their customer base with most potential customers being active participants on these platforms. It also provides them with an opportunity to interact with customers more easily.

A detailed look at the benefits that MSMEs in Lusaka accrued from the use of the internet showed that 92% of the MSMEs benefited from the networking that internet connectivity provided, as was also seen in other studies. 63% benefited from information sharing and 54% of the MSMEs benefited from reduced operational costs and reduced paper wastage as presented in figure 6.

However, the internet did not significantly impact the services they offered. Only 38%

[43] Guerriero, 2015

[44] ZICTA, 2022.

stated the internet offered an increased ease of delivery of services and only 17% stated that the use of internet improved their business' service quality. Possibly, a lack of effective use of the internet to enhance quality and service delivery is a limiting factor for MSMEs.

The present study focused on tech enabled MSMEs in the urban area of Lusaka. Information used in the survey was obtained from the business owners (75%), managers (17%) and executive directors (8%). Of these interviewed, 75% were male and 25% were female. Most of the MSMEs that participated in the survey were run by youths between the age of 24 and 34 years (83%) and all their businesses used the internet in their daily operations. All the participants stated that they had a tertiary education. The focus of this study was on how tech enabled MSMEs utilized the internet in their business operations. Around the world MSMEs are adopting internet connectivity as a necessity in their operations. As the study discovers, most MSMEs started using the internet within a year of setting up their businesses. This was more apparent for MSMEs that began operations after 2010. Those that started their operations before 2010 integrated the internet into their business after approximately 5 to 8 years of operation. This highlighted Zambia's growing population of young people with ICT skills.

The MSMEs that participated in the survey cut across activities with 42% engaged in trading, 38% in services and 21% in simple manufacturing. All the MSMEs stated that they used 4G mobile network technology highlighting the growing prominence of this technology in urban areas. These MSMEs stated that they preferred mobile broadband either in form of portable devices or modems due to the various advantages these offered. These advantages included:

(i) Convenience as it allowed them to access the internet anywhere

(ii) Portability. The use of devices that allowed them to access the internet such as smartphones and dongles proved to be less cumbersome or heavy.

(iii) MSMEs stated that these modes of accessing the internet were easy to use and not complicated to set up.

(iv) Mobile broadband provided faster, or better internet speed compared to the ethernet cable.

(v) MSMEs also stated that mobile broadband proved to be more affordable when compared to other forms of accessing the internet. Mobile internet service providers have developed various data packages to cater to different users' affordability.

(vi) Mobile broadband was seen to be more affordable to maintain and stable as it was less prone to disruptions that may occur due to power cuts.

However, in the Zambian context, the assets of internet connectivity are underexploited.

Currently, 55% of MSMEs in Zambia participate in the digital economy.[45] These are mostly urban based MSMEs. In rural areas, 56% of the population does not participate in the digital economy. The ZICTA 2018 survey discovered that 28.1% of individuals in urban areas use the internet while only 5% do in rural areas.

The urban-rural digital divide can be attributed to infrastructure that is not inclusive of rural areas. The cost of connecting the rural areas is compounded by geographical elements and dispersed populations.

[45] Ministry of Commerce, Trade and Industry, Micro, Small and Medium Enterprises Development Policy, 2008.

A lack of ICT skills also hinders the adoption and use of internet in rural areas.[46] Most institutions that provide digital skills training such as tech hubs are in urban areas. Additionally, rural areas face challenges in accessing support utilities such as electricity. In Zambia, 58% of the population lives on less than $1.90 per day, and three-quarters of the low-income population live in rural areas[47]. This has a bearing on their ability to afford internet access as well as internet enabling devices. The ZICTA 2018 survey revealed that 62.5% of individuals own mobile phones in urban areas compared to 33% in rural areas.

Moreover, according to interviews undertaken as part of this survey analysis, the main use of internet by MSMEs is restricted to marketing and social media advertising. Users seem to lack the incentive to invest in utilising the internet to a greater extent. The lack of digital service offers contribute to low level of online consumer demand which leads MSME owners to develop offline business models.

Barriers in undertaking online business transactions in the Zambian landscape

Despite the abundant evidence suggesting that the adoption of ICT technology and enhanced connectivity improves business performance, many firms and MSMEs remain unconnected because of the many barriers affecting their adoption of new technology. Urban MSMEs face different barriers than rural MSMEs.

High costs related to Internet use

The cost of internet services and devices remain a challenge among MSMEs. 75% of MSMEs in the study viewed the high cost of internet access to be a constraint in the adoption and use of the internet. In the study, internet service charges had a bearing on the preferred mode of access. Some businesses would have preferred to use fibre rather than mobile broadband but found it to be too expensive despite it being able to provide faster internet access. The MSMEs that participated in this study are willing to spend between US$ 10.6 to US$117.6 per month on internet access while fibre would cost within the range of US$58.8 to US$323.5 per month.[48]

79% of MSMEs were willing to spend between US$10.6 to US$29.4 per month on internet services.

21% of MSMEs were willing to spend between US$35.3 to US$117.6 per month.

In Zambia, the cost of internet access (specifically fibre) is affected by four major components: the strength of the Zambian Kwacha (local currency), the high cost of fibre termination fees at towers, the high cost of in-country transit and transport costs for connectivity and custom duty on cables.[49] The ICT sector being one of the most highly taxed sectors[50] in Zambia affects the cost of services and digital devices as well as the level of investment in the sector.

Another factor linked to high costs is the limited number of ISPs in the market. According to the broadband speed checker database, there are 10 ISPs in the Zambian market that provide an average download speed of 17.93 Mb/s.[51] The lack of competition removes incentives for ISPs to provide better quality offers. From the experience of MSME and hub leaders it appears that ISPs deliver poor quality connection at a high price, including many connection disruptions. This creates a lot of uncertainty for business owners that will

[46] Ibid.
[47] World Bank, 2020.
[48] Based on survey of different packages.
[49] ZICTA, 2022.
[50] World Bank, 2020.
[51] Broadband Speedchecker, ISPs in Zambia, 2022

therefore tend to develop an offline business model. As mentioned above, the ICT sector is highly taxed. ISPs interviewed for the analysis point out that taxation does not enable them to invest in better infrastructure and services. The ISP noted that the cost of renting towers coupled by dominance of some providers contributed to the high cost of internet.

Moreover, it has been observed that the cost of devices and connections tend to be a greater hinderance for MSMEs compared to larger firms. A survey cited by the International Labour Organisation (ILO) found that 55%, 47%, and 42% of informal MSMEs in Rwanda, Cameroon and Tanzania could not use mobile phones for business purposes due to cost reasons.[52] In general, falling costs of internet access has not been sufficient to increase the online participation of MSMEs in these countries. Moreover, MSMEs are less likely to adopt and use technology when their initial set-up costs are high. In regions with limited financial support for enterprises to adopt and use new technologies, the lack of financial support affects their decision to adopt and use technology.

Infrastructure problems

Studies have also shown that the problem of affordability is compounded by the roll-out of infrastructure. The lowest affordable levels such as basic internet is found in the least affluent regions where MSMEs are established compared to quality infrastructure in more affluent regions[53]. The lack of availability of quality internet such as broadband, fibre, 4G and 5G for effective business transactions is a challenge for MSMEs in regions that lack such services.

The poor technical environment includes the unavailability of ideal technology and e-business infrastructure which tend to obstruct the adoption and use of internet by MSMEs. Often, the available device types and their quality tend to be limited with poor functionality from in-house connectivity infrastructure such as servers, desktops, laptops, smartphones, and other devices[54]. MSMEs in areas with unreliable power and inadequate infrastructure may be hampered in their use of digital devices to support internet connectivity.

The extent of internet penetration remains low Zambia, as is also seen in most other African countries. Some regions have no access to internet services. In instances where internet services are available, the bandwidth and reliability of internet - that is basic internet connection versus broadband - become critical in the MSMEs' decisions to use internet services.[55] In most cases, internet services are provided through 2G networks and are thus unreliable, which discourages the adoption of internet services for business.

Lack of ICT skills

MSMEs need to have a minimum level of digital skills and innovation orientation if they are to adopt technologies to achieve significant productivity gains. However, in most countries, the use of technology is hampered by the digital skills shortages among MSMEs which must compete with larger firms for scarce digitally skilled human resources. This skills shortage occurs across the range of digital technologies including internet related platforms like setting up emails, creating websites and integrating digital payment channels on business websites. The lack of skilled individuals to effectively deploy and use the internet for business services

[52] ILO, 2021
[53] Panos London, 2010.
[54] Mukamanzi and Ndikubwimana, The effects of ICT adoption on Small and Medium sized Enterprises in Rwanda: A Case study of Kigali City, 2018.
[55] Giovanni and Mario, Small company attitude towards ICT based solutions: some key elements to improve it, 2013.

in turn leads to reduced demand for digital adoption.[56]

On the consumer side, there is a lack of critical mass usage which also serves as a major external hindrance that obstructs the use of the internet for business by MSMEs. If the adoption and usage of the internet among customers and businesses is low, MSMEs in such settings will tend to struggle more than those in areas with experience using the internet and digital applications. Weak business networks - such as customers, supply chain partners and platforms could incentivize or limit the extent to which the MSMEs adopt digital technology.

Lack of Linkage between Digital and Entrepreneurial Skills among Youths

Zambia has a growing mass of young people with ICT skills from various institutions of learning with vested interests in ICT related innovations. However, these young people have limited understanding of entrepreneurship as well as how to turn their innovations or ideas into viable commercial ventures. This can be attributed to:

- The curriculum at many higher learning institutions is usually aligned to strengthening technical skills in software development and to some extent coding but has not been aligned to improving entrepreneurship culture amongst learners. For example, at primary and secondary schools' levels, there is also some effort to introduce coding related training while some initiatives outside schools also have similar focus on young people such as developing interest in robotics.
- A lack of commercialisation of school projects: most of the ICT related initiatives, developed as part of final year projects are also not fully developed to commercialisation but are left as mere concept documentation. Hence, these projects are not linked to any potential industry partners that may have interest in commercialising the effort.
- Limited linkages between the existing critical mass of software developers and the expected target industries. In this regard, the developers are not able to respond to specific industry needs or any social challenges in the country as these gaps are not clearly identified and well disseminated.

> ***"Youths as early adopters of new technologies can be linked with tech hubs in order to use this skill in entrepreneurship – Ministry of Technology and Science and United Nations Capital Development Fund, 2022"***

Generally, there is a growing interest to venture into innovation and entrepreneurship in Zambia especially amongst the youth who form the largest part of the country's population. This interest is largely explained by the huge unemployment challenge in the country which provides an opportunity for innovation and entrepreneurship to sustain livelihoods or generate incomes. It provides a huge opportunity for the country to leverage this growing interest in building an entrepreneurship culture and equipping the youth with the necessary business development skills on how to start, manage and scale enterprises. There is also an

[56] Tang and Konde, 2020.

opportunity to connect these youths to peers with technical skills that could help operationalise their ideas into viable business start-ups or social-economic solutions to some of the local challenges.

IV. Recommendations

The perceptions on digital connectivity vary among users and providers. These perceptions are influenced by the benefits as well as challenges experienced. Internet Service Providers have a wider view on digital connectivity as they interact with the regulators, authorities as well as the end users.

Tech hubs are also prone to various challenges themselves and through their interactions with MSMEs have an idea of what can grow these businesses. The tech entrepreneurship ecosystem study undertaken by ITC in 2020 showcased that tech hubs also face challenges related to a lack of international mentors, few programmes available to scale MSMEs beyond the Zambian boarders and training for more mature start-ups, and a lack of funding opportunities for start-ups. Access to digital connectivity can potentially assist to address or mitigate some of these observed challenges.

Internet Service Charges

The cost of the internet has a bearing on how MSMEs can adopt digital connectivity to foster growth and survival. Most MSMEs adopt the mode of internet connectivity based on their ability to pay and not because of quality of service. For MSMEs, digital inclusion represents an opportunity to increase visibility, efficiency, and be connected to other market players who can provide critical services, such as access to finance and trade markets[57]. However, the high cost of internet as well as shortage of internet enabling devices influence their usage of internet. From the study findings some investments must be made. For instance, to reach market efficiency (cheaper price, better connectivity, offer diversity) the authorities should work on more suitable regulation of the ISP sector to ensure a greater number of providers that will compete to offer a better service. To reach this goal, incentives must be given to ISPs to connect more broadly the Zambian territory. Indeed, the taxation framework should be reworked to lower the barrier to entry for new market participants and incentivise investment in the sector.

Internet Infrastructure recommendations for improvement

As earlier stated, digital infrastructure is critical for the development of the ICT sector. MSMEs, tech hubs and ISPs depend on a thriving ICT sector to effectively deliver their services and products. Good internet infrastructure and support services can create such an environment.

The major proposition calls for the development of a national ICT strategy.

Practically, it may consist of investment in satellite infrastructure so that internet access will be more affordable and provide good connectivity; the enlargement of data centres and the construction of more communication towers in the country so that rural areas have access to affordable internet. Additionally, the adoption of emerging technologies such as 5G.

Demand for internet services motivated investment in enlarging capacity, especially in fibre. However, there is need for a more organised way to set up the fibre network. Currently, every service provider is responsible for setting up their fibre network. For instance, providers suggest that the authorities should take up the role of setting up planned sites and construct tunnels to lay the fibre network. This would minimise service disruptions caused by fibre cuts.

[57] World bank, 2020.

ICT skills among MSMEs staff and users

To promote the use of digital tools among MSMEs training sessions are highly recommended. It appears that hubs suffer a shortage of members/clients. The reason is simply that MSME owners do not all have skills to take advantage of new digital tools.

Elsewhere in the continent, similar initiatives have been launched with great success. For instance, in Nigeria the "Get Nigerian Business Online" initiative launched in 2011[58] accompanied thousands of businesses over the unveiling of their professional website for desktop and mobile with multiple partners such as Google, Ecobank and the Ministry of Communications and Technology.

The Zambian government indicated that MSMEs are being supported through Innovation Programmes under National Technology Business Centre (NTBC) and ZICTA. In addition, they observed that some new regulations such as the Data Protection Act, Electronic and Transaction Act, Cybersecurity Act have been introduced with an aim of increasing confidence in the use of online platforms. Specifically, for MSMEs, the 2008 Micro, Small and Medium Enterprise Development Policy was as of June 2022 being revised. The policy will include strategies with the aim of promoting research, innovation, technical know-how and use of technology among MSMEs.

V. Conclusion

The majority of the MSMEs in this study used mobile phone-based internet connectivity and portable devices like dongles or modems. However, the majority of MSMEs used the internet for a limited range of services. The internet was mostly used for advertising, market research and digital transactions. The majority of MSMEs did not own or manage their own websites and rarely used internet services for product innovation.

The result of the study also revealed that the use of internet and internet connectivity was hampered by several factors. These factors were compounded by a lack of appropriate skills to foster the adoption and use of internet services. Most MSMEs were not affiliated with any tech hub and therefore could not benefit from the services they offer. The study also revealed that most urban MSMEs in Lusaka were not familiar with the legal and regulatory frameworks supporting the sector. Most MSMEs also had little knowledge of how the current infrastructure affected their businesses as well as innovations that this infrastructure needed.

Although all sampled MSMEs had access to internet connectivity using mobile phones, they do not use the connectivity to its fullest extent due to the high cost of devices and internet services as well as inadequate infrastructure that would provide connectivity. Thus, there is a need for the government to implement policies and measures that foster the adoption of ICTs and internet connectivity such as fiscal incentives that lower the cost of devices, reduction in excise duties on airtime and data bundles, as well as shared low-cost data centres for information storage. Government could also investigate possible incentives so that service providers can connect regions that lack adequate infrastructure.

In addition, most urban MSMEs in Lusaka faced internet disruptions at least once a week. This suggests the need to establish support mechanisms that foster the adoption and use of reliable connections. The government could consider accelerating the development of infrastructural facilities (such as low-cost broadband connectivity) that contribute to increased utilization of ICT and internet connectivity by MSMEs.

[58] Dalberg, 2013

Government and ISPs could also further incentivize the creation of tech hubs that serve as business incubators and promote the adoption and use of ICTs by MSMEs.

Finally, government could also consider activities that build capacity in ICT skills and increase ICT usage by MSMEs. This should be accompanied by a strategy paper targeting increasing internet connectivity among MSMEs as well as promoting information, education and communication activities about ICTs and internet use among MSMEs. This could also be enhanced by incentivizing the establishment of connectivity supported hubs across the country by promoting infrastructure sharing activities among providers to increase coverage.

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