

### ICT PENETRATION LEVEL IN BOTSWANA

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# INTRODUCTION

- This paper aims to examine the level of ICT penetration in Botswana.
- The use of ICT is important to solve problems.
- With Botswana moving towards a knowledge-based economy, especially in the rapid technological advancement, the country has shifted to skills focusing on the fourth industrial revolution.
- The revolution involves the use of technologies in the internet of Things (IoT), cloud computing, big data, robotics, and Artificial intelligence.
- The integration of the technologies has also led to digital banking, especially after COVID 19 when people were using online transactions during and after the pandemic.
- In Botswana, the Ministry of communication ,its mandate is to connect and network communities through safe, secure, and accessible transport communication infrastructure.
- Internet providers in Botswana are Botswana Telecommunications Corporation (BTC), Broadband Internet Botswana (BBi), Jenny Internet Botswana, Mascom, Orange Botswana, Abari communications Botswana, Zebra Net, etc.
- The major three mobile networks; Mascom, Orange and Bemobile provides mobile money.
- All the mobile transactions help the unbanked population to do their transactions with ICT



## INTRODUCTION

- E-government initiatives introduced in 2013 aimed for service delivery improvement including the national identity card-OMANG, vital statistics registration (birth, marriage, death, etc), government core services (HR, finance, procurement, project management and knowledge management (Samboma, 2019).
- ICT is used in digital channels using mobile money and internet banking such as payment of airtime, electricity, and water bills need good coverage of the internet.



### **PROBLEM STATEMENT**

- Despite increasing ICT penetration in the world as a driver in economic development, part of the population and districts in Botswana lack access to it.
- Mogotlhawane and Underwood (2013) point out that although ICT is available in cities like Gaborone, it
  is still beyond the reach of the majority of people who do not have disposable income.
- Qiu (2019) points out that majority of people in Botswana reported not being connected to efficient networks services such as hot spots, wireless infrastructure, and fixed broadband lines.
- Mogotlhawane and Underwood (2013) points out that costs of using ICT, remains the biggest problem that prevents members of the public from using the technology.



### **SIGNIFICANCE OF THE STUDY**

- To provide information to policymakers to identify districts where the ICT penetration level is low.
- The government will identify the areas that need improvement in terms of ICT infrastructure.
- The internet service providers will be able to identify districts where the internet connection is very low.
- Financial institutions like banks will be able to identify the population not reached by the use of online and mobile
- The researchers will advance more research on the effects of lack of internet access on other sectors like mining and tourism using the population, which the ICT penetration was low.



### **OBJECTIVE OF THE ANALYSIS**

The objectives of the analysis are to

- (a) determine the level of ICT penetration in Botswana and districts.
- (b) identify the major type of internet access in Botswana
- (c) determine the main age group which accesses the internet and uses ICT
- (d) find challenges facing ICT penetration in Botswana



### **DEFINITIONS OF MAIN CONCEPTS**

- Internet connectivity refers to how people are hooked to the internet using telephones, broadband, and wireless devices
- Use of the internet refers to connecting to the internet and checking mail, downloading, social media, etc.
- Internet access is a facility or service that provides connectivity for a computer, a computer network, or other network device to the Internet,



### LITERATURE REVIEW

- ICT is one driver of economic growth in developing countries.
- The 2030 agenda for sustainable development goals focuses on achieving the ICT penetration levels in different countries.
- Goal 5(b) focuses on the use of enabling technology, in particular information and communication, to promote the empowerment of women (UN, 2015).
- ICT is the backbone of most of the sectors to empower the nation.
- Goal 9(c) focuses on increasing access to information and communication technology and strives to provide universal and affordable access to the internet in least-developed countries by 2030. (UN, 2015)
- The ICT penetration is targeted by goal 17.8, which focuses on fully, operationalise the technology and innovation capacity-building mechanism for least developed countries by 2017 and enhancing the use of enabling technology, in particular information and communication technology. (UN, 2015)



### **LITERATURE REVIEW**

- Agenda 2063 focuses on accelerating the technological transformation with the development of ICT in the digital economy, (African union commission, 2015).
- The focus is also on connecting Africa through excellent infrastructure projects in ICT.
- The focus of the continent is on an integrated e-economy where every government, business, and citizen has access to reliable and affordable ICT services.
- The targets were to increase broadband penetration by 10% by 2018; broadband connectivity by 20 percentage points, and provide access to ICT to children in schools and venture capital to young Africa. (African Union Commission, 2015)
- In Statistics Botswana (2022), the fixed telephone subscription had decreased by 2.3% in Q4 of 2022.
- Mobile cellular telephone subscriptions had increased by 0.8% in Q4 of 2022.
- The internet subscription increased by 3.6% in Q3.

Mobile money subscriptions had increased by 1.3% in Q3.

- The fixed-to-mobile telephone domestic calls traffic went down by 0.65 in Q4 of 2022.
- The mobile to fixed telephone domestic calls traffic had decreased by 1.1% in Q4.
- The outgoing international call traffic from fixed telephones had decreased by 8.2%.

The mobile telephone increased by 0.8% in Q4 of 2022



### **LITERATURE REVIEW**

- The ICT sector made a contribution of 2.5% to the total GDP in Q4 of 2022. The ICT sector realised an annual growth rate of 4.6%, Statistics Botswana (2022)
- As part of the DE4A (Digital economy for Africa) initiative, were to measure success against the goal of ensuring that every individual, business, and government is digitally enabled by 2030, World Bank Group (2022).
- The objective of the DE4A was to connect countries digitally through ICT by 2030.
- The priority areas were aimed at closing access gaps, making digitization worthwhile, improving the enabling environment, leveraging private sector resources, and overcoming geographic barriers, World Bank Group (2022)
- The pillar of sustainable economic development in Vision 2036 focused on Botswana as an efficient economy, vibrant, innovative, and knowledge-based with leading-edge technology and infrastructure, Vision 2036(2016).
- This showed that the economy was focusing on improving technology in the country through ICT. Vision 2036(2016), states that ICT is a key contribution to economic growth and employment.
- Therefore, a country needs to understand the level of penetration of ICT as it aids in economic growth and employment



### **METHODOLOGY**

- The quantitative approach was used in this study to analyse data.
- The variables used in the analysis were; the use of a computer, use of mobile phone in the last 3 months, use of internet in the last 3 months, internet connectivity, internet access, and reasons for not accessing the internet.
- The analysis focused on the whole population, districts, and age groups.
- SPSS version 27 was used to organise responses (data) into frequency tables, graphs, and cross-tabulations.
- The chi-square was used to test the association between the age groups and internet connectivity.
- The frequency tables, graphs, cross-tabulations, and chi-square results were used to discuss the data



- Use of a computer in the last 3 months
- Figure shows that **31.7%** of the population had used computers in the last 3 months.
- Those who had not used computers were 68.3%.
- It shows that more people had not used computers as compared to the ones who used them.





#### District population and percentage use of computers in the last 3 months

- The high percentage of the population using computers was from the following districts, **Orapa with 76.7%** followed **by Gaborone with 63.3%**, and **Jwaneng 60.1%**.
- The figures show that the two mining towns Orapa and Jwaneng had a high percentage of the population with computers.
- Districts that had the lowest use of computers were Ngwaketse West with 12.4%, followed by CKGR with 13.5%, and then Kweneng West with 13.6%.



#### Use of mobile phone in the last 3 months

- The evidence from the bar graph shows that **77%** had used mobile phones while **23%** of the population had not used mobile phones.
- Although the graph showed that the number was high who had used the mobile phone, there was a significant population who had not used the mobile phone.



Ves No

District population and percentage use of mobile phones in the last 3 months

- The data shows that the highest number of the population that used the mobile was in **Orapa district with** 91.3%, followed by **Gaborone with 90.5%** and **Jwaneng with 90.3%**.
- More than 90% of the population in the two mining towns Orapa and Jwaneng showed that almost every household was using a mobile phone.
- The only district that had less than 50% of the population using a mobile phone was CKGR with 32.1%.
- However, the other districts had low use of mobile phones but the percentage was above 50% like Ngwaketse West 60.2% followed by Ngamiland West 60.6%.



#### Use of the Internet in the last 3 months

- The graph shows that 57.9% of the population had used the internet and 42.1% of the population had not used the internet.
- The results showed that 42.1% had not used the internet and therefore there was a need to check why the population was not connecting to the internet.





Districts population and percentage use of internet in the last 3 months

- Orapa district had the highest use of the internet with 94.6% of the district, followed by Gaborone with 83.8% and Jwaneng with 82.0%.
- The two mining towns Orapa and Jwaneng had high use of the internet, which agrees with the results of previous figures that the two towns also had high use of mobile phones.
- The lowest use of the internet was in Ngwaketse West with 32.1% of the district population, followed by Kweneng West with 33.1%, and Ngamiland West with 41.0%.



#### Internet connection

The percentage of the population that connected to the internet was **41.2%**, the percentage that did not connect to the internet was **57.6%** and **1.2%** did not know.

 Based on the evidence there is a need for ICT literacy so that the population understands what connectivity of the internet meant





#### District population and percentage of internet connectivity

- The highest responses of internet connectivity were in Orapa district with 88.2%, followed by Gaborone with 63.5%, and Jwaneng and Sowa with 62.3%.
- The data shows that the three mining towns, Orapa, Jwaneng, and Sowa had the highest responses of internet connectivity.
- The lowest internet connectivity was in the CKGR district with 4.8% of the population in the district, followed by Ngwaketse West with 19.4%, and Delta with 21.1%.
- The districts that had responses that did not know about internet connectivity were **Delta** with 7.9% of the population, **Ngwaketse West 3.5%**, and **Kweneng West 2.4%**.



#### **Types of Internet access**

- The highest type of internet accessed was Mobile internet with 68.1%, followed by fixed wireless with 24.% and Asymmetric digital subscriber line (ADSL) with 5.8%.
- The satellite broadband and fibre-to-the-home/building internet were accessible by few responses with a percentage of 1% for both types.





#### Percentage of district type of internet accessed

- On the asymmetric digital subscriber line (ADSL), the district, which had the highest, was **Jwaneng** with 11.2%, followed by **Gaborone with 10.8%** and **Lobatse at 10.1%**.
- The lowest responses were in CKGR and Delta at 0% and Ngwaketse West at 1.1%.
- On the fixed wireless, Orapa had the highest of 58.7%, followed by Gaborone with 40% and Lobatse with 38.1%. The lowest was on CKGR with 0%, Delta with 7.7%, and Kgalagadi North with 7.2%. Generally, most districts had high connectivity of mobile internet.
- The district with the highest population on a mobile internet connection was **Delta district with 92.3%**, **Kgalagadi North 87.6%**, and **Southern 84.8%**. The district with the lowest mobile internet was **CKGR with 0%** followed by **Orapa with 30.6%**, and **Gaborone with 42.4%**.



Percentage of district type of internet accessed

- The Satellite broadband internet connectivity was high in **Sowa with 2.6%**, **Gaborone 2.3%**, and **Francistown with 1.3%**.
- The lowest connectivity on satellite broadband was **Delta with 0%**, **Kweneng West with 0.1%**, the following **Barolong**, **Ngwaketse West**, and Jwaneng with 0.2%.
- On the fibre-to-the-home/building internet connection, all districts recorded less than 5% as compared to the other types of internet connection.
- The highest on fibre-to-the home/building internet connection was recorded in Gaborone with 4.4%, Jwaneng with 1.2%, and South east 0.7%. However, the lowest of 0% were in Selibephikwe, Sowa, Delta, and Delta.



#### Reasons for not accessing the internet

- The major reason for not accessing the internet was due to cost. The two costs were the cost of the equipment at 23.8% and the cost of service at 18.2% of the population. Then followed by lack of knowledge or skills with 18.6%.
- The other reasons that contributed to the reasons for not accessing the internet were the respondents 'did not need the internet' 15.3% and those who 'had internet access somewhere' 9.3%, and no electricity 7.7%.
- low response of not connecting to the internet was also privacy or security concerns with 0.2% and internet service provider was not in the area with 3.1%.



Do not Have access Lack of Cost of the Cost of the Privacy or internet to the knowledge equipment service is security service not electricity internet internet or skills is too high too high concerns available in in the elsewhere the area household Reasons for not accessing internet.





Percentage showing districts and reasons for not connecting to the internet

- For those who responded that they did not need internet CKGR had 45.0% of the district population and Kgatleng (wards) 20.4%.
- Those who responded that they had internet access somewhere were from Jwaneng **22.8%** and Sowa 20.2%.
- Lack of knowledge or skill they were 35.2% in Kweneng West and 27.5% in Kgalagadi North.



Percentage showing districts and reasons for not connecting to the internet

- The cost of equipment was too high with 33.3 % for Lobatse and 30.7% in Ngamiland East with 30.7%. The cost of the service was too high; Sowa had 36.0% and Gaborone 33.8%. Of those who responded with the reason of privacy or security concern, Chobe was 1.3% and Kgalagadi north 0.4%.
- The internet service was not available in the area; CKGR had 48.8% and Delta 33.8%. Of those who responded that there was no electricity in the household, Delta had 41.9% and Ngwaketse West 14.2%.
- The highest response for no internet service available with 48.8 % in CKGR and do not need internet 45.0% in CKGR.



#### Age structure and internet connectivity

- The age group 30-34 years showed that they were able to connect to the internet with 48.4%
- The next group was 25-29 years with 47.8% and followed by 35-39 years with 46.8%.
- Working active group from 25 to 39 years had the highest connectivity on the internet.
- The age group 0-4 years had the highest of not connecting to internet with 100%. The age group 5-9 years was next with 85.7% followed by those above 100 years with 80.7% for not connecting to the internet.
- The inactive working group was contributed the high percentage of the population not connecting to internet.
- Chinn and Fairlie (2006) point out that, the ages above 65 had a lower domain for technology use because of absence from the labour force.



#### Age structure and internet connectivity association

 A chi-square test of independence was done to test if there was an association between age group and internet connectivity at a significance level of α=0.05.

H0: There was no association between age group and internet connectivity

- H1: There was an association between age group and internet connectivity.
- All the assumptions of chi-square were satisfied to conduct the test



#### Age structure and internet connectivity

#### **Chi-square test**

- The p-value from the data was 0.000, which was below the significance level of α=0.05, and therefore we reject the null hypothesis and conclude that there is a significant association between age group and internet connectivity.
- Although the association was identified, the chi-square has its limitations of not being able to determine the strength of the association.



### **POLICY IMPLICATIONS**

- a) The government should priorities equal access to the internet in areas where there is no internet by providing it in rural districts.
- b) Policymakers should provide policies that promote mobile internet access to focus on digital banking so that people pay from any part of the country. This also promotes e-government payments and increased accessibility to financial institutions.
- c) The government should increase free Wi-Fi hot spots, to cater for the cost of the service.



### CONCLUSIONS AND RECOMMENDATIONS

- The trends on the ICT penetration indicated that 77% of the population were using mobile phones.
- Data showed that 31.7% of the population were using computers and were from the Orapa district.
- The districts with mines like Orapa had ICT penetration as shown by the use of the internet with 94.6%, the use of mobile phones at 91.3%, and internet connectivity at 88.2%.
- The increased use of ICT in mines helps in the economic development of automation and artificial intelligence.
- Mobile internet showed that it was the highest type of internet used. Mobile internet promotes economic development through digital payment in rural areas.
- Satellite broadband and the fibre-to-the-home/ building internet were the lowest type of internet used therefore the government needs to improve the coverage of the types of internet as they have fast internet connectivity.



### CONCLUSIONS AND RECOMMENDATIONS

- The major reasons for not connecting to the internet were due to cost of equipment and service.
- Lack of skills also contributed to lack of internet access and therefore the government can introduce youth programmes on ICT skills literacy. However, further research is required to identify the ICT skills gap.
- The government is recommended to identify the infrastructure required to make internet accessible.
- The internet service providers need to increase internet coverage in areas with no internet access.
- The financial institutions have to find ways of accessing the unbanked population using ICT to improve service delivery



# Thank you

