BRIDGING DIGITAL DIVIDE

WITH THE USE OF NETWORKING AND TELECOMMUNICATION INFRASTRUCTURES IN SIERRA LEONE

BY

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A Proposal submitted to the department of Modern Software Development in I. I. Vorovich Institute of Mathematics, Mechanics and Computer Science in partial fulfilment of the requirements for the award of Masters in the Russia Federation

February, 2026

ABSTRACT

The right to Internet access, also known as the right to broadband or freedom to connect, is the view that all people must be able to access the Internet in order to exercise and enjoy their rights to freedom of expression and opinion and other fundamental human rights. States have a responsibility to ensure that Internet access is broadly available, and that states may not unreasonably restrict an individual's access to the Internet. (WSIS Declaration, 2003)

This chapter discusses the disparity in access to digital infrastructure and services that exists between regions, communities, countries and people in the world. This disparity is referred to as "digital divide". Digital divide is obviously of key importance to the development of countries, regions and societies.

This unequal access to digital infrastructure and technology, including smartphones, tablets, laptops, and the internet worsens inequality around access to information and resources.

However, different approaches exist to address this problem. In this chapter I explore practice oriented approaches to serve people and communities in currently unconnected regions of the Sierra Leone. I will discuss how this might best be done, upholding ethical standards, inclusivity, and human-cantered principles. To illustrate this in action, I present a case study from remote rural areas in Sierra Leone.

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CHAPTER ONE

1.0 INTRODUCTION

In the world today, millions have access to internet and other technological devices while millions do not also have. This to me is a great gap and **digital divide** is the gap between those who already access computers and the internet and those who do not (National Telecommunications and Information Administration (NTIA), 1999). It is the gap between those who have access, can adopt and use new technologies and those that cannot despite the pace of innovation. This disproportionate gap between the two can deepen, and when this happen that growing gap is the **digital divide** (Ojo and Raman, 2017). In an attempt to reduce this gap towards digitalization for all, several benefits can be achieved. At the individual level, there are opportunities for personal and professional growth, as well as a convenient way of accessing knowledge, connecting with friends and family, and accessing daily services. Digitalization also significantly benefits companies and governments by saving resources, enhancing productivity, connectivity and interaction.

This disparity is considered a global challenge and is obvious that digital infrastructure, information and communication are of key importance for the development of countries and regions.

In an age where connectivity is paramount for education, employment, healthcare and even social interaction, the digital divide represents a significant societal challenge. This gap between those who have access to high-speed internet and those who do not exacerbates existing inequalities, hindering opportunities for millions worldwide. However, amidst this dilemma, telecom companies should step up to play a crucial role in bridging this gap, employing innovative initiatives and technologies to ensure equitable access to the internet, especially in underserved communities.

Networking and telecommunication infrastructure are key components that make up digital information and communication. Digital information is any data that is stored, transferred, read and used by networks, computers, and other machines while digital communication is the process of exchanging information, messages and ideas using digital technologies and platforms. It involves the transmission and reception of data through electronic devices and networks.

Data refers to information presented in whatever form is agreed upon by the parties creating and using the data.

1.1 OBJECTIVES

The primary objectives of this research are as follows:

- To assess the impact of networking and telecommunication technology on remote rural areas of Sierra Leone, specifically focusing on internet and telecommunication sectors

- To examine the scalability and flexibility of Internet Service Providers (ISP) telecommunication industries in Sierra Leone to adapt to citizens demands and rapidly scale up its operations as needed.

- To analyse the impact of data availability and affordability to an ordinary Sierra Leonean.

1.2 SCOPE

The scope of this research "Bridging the digital divide with the use of networking and telecommunication infrastructures" entails a focused investigation into the disparity caused by in accessibility to internet and technological equipment for people living in remote and deprived arrears.
There is rapid growth in digital technology, often referred to as information and communications technologies (ICTs) in a broader sense and this has largely reshaped our daily lives and how we do businesses globally. These include assessing operational efficiency enhancements, cost-effectiveness gains, scalability Improvements, data security measures, and the impact on customer service. The study encompasses both quantitative and qualitative data collection methods, combining surveys and interviews with key stakeholders to gather insights into the perceived impact of these inequalities in the access and use. The recommendations and lessons learned will provide practical guidance to the government, ISPs and donor partners to join hands and mitigate or bridge the digital divide in Sierra Leone.

CHAPTER TWO

2.0 BACKGROUND OF THE STUDY

Since the 1990s when the internet began to be commercialised globally, the debate on how to close the digital divide has attracted widespread attention (G20 Germany, 2017).

In 2019, about 53.6% of the world's population (equivalent to 4.1 billion people) were reported to be using the Internet (International Telecommunication Union, 2020).

Sierra Leone is a country that has a population size of 8.6 million (World Bank, 2023) and 1.84 million internet users in January 2023 and the internet penetration stood at 21.2 percent (Digital, 2023).

In January 2023, Sierra Leone had 779.8 thousand social media users equating to 9.0 of the total population and a total of 9.19 million cellular mobile connections were active in early 2023 (Data Reportal, 2023).

This disparity is considered a global challenge and is obvious that digital infrastructure, information and communication technology are of key importance to the development of countries and regions.

CHAPTER THREE

3.0 LITERATURE REVIEW

The literature review delves into existing research and academic studies related to bridging the digital divide with the use of networking and telecommunication infrastructures. It encompasses a wide range of sources, including peer-reviewed articles, books, industry reports, and case studies, to present a comprehensive understanding of the subject matter.

Key topics covered in the literature review include

3.0.1 Networking and telecommunication technology

Networking describes how devices interconnect to share resources with each other. Telecom, which includes networking, broadly refers to the exchange of data across long distances with the use of wired or wireless medium.

3.0.2 Digital technology

Digital technology refers to digital devices, systems, and resources that help create, store, and manage data. An important aspect of digital technology is information technology (IT) which refers to the use of computers to process data and information.

3.0.3 Data communication

Data communication is the transfer of data, transmitted and received over a point-to-point or point-to-multi point communication channel. These channels can be cooper wire, wireless, optical fibre communication using radio spectrum, storage media and computer busses. The data are represented as an electromagnetic signal, such as an electrical voltage, radio wave, micro wave and infrared signal (Data Communication and Networking - Behrouz A. Forouzan, et al).

3.0.4 Digital Divide

Digital divide is the gap between those who already access computers and the internet and those who do not *(National Telecommunications and Information Administration (NTIA), 1999).* It is the gap between those who have access, can adopt and use new technologies and those that cannot despite the pace of innovation. The disproportionate gap between the two can deepen, and when this happen that growing gap is the digital divide *(Ojo and Raman, 2017).*

CHAPTER FOUR

4.0 RESEARCH METHODOLOGY

The research methodology outlines the approach and strategies employed to achieve the study's objectives, which is to evaluate the impact of technology and digital transformation on individuals and society through a case study approach. The methodology encompasses data collection methods, analysis techniques, case selection criteria, and ethical considerations.

4.1 DATA COLLECTION METHODS

4.1.1 Interviews

Key stakeholders within selected communities, including head teachers, principals, and students, were interviewed. The interviews were semi-structured and designed to gather insights into the decision-making process, experiences, challenges, and benefits associated with the internet and use of digital technologies.

4.1.2 Surveys

Surveys were administered to collect quantitative data on specific use of the internet, such as cost savings, operational efficiency, and security performance. The survey responses will complement and validate the qualitative findings from the interviews.

4.1.3 Documentation and Reports

Internal documents, reports, and performance metrics related to digital communication were analysed to gain a comprehensive understanding of the impact of internet availability on various individuals in remote and deprived communities in Sierra Leone.

4.2 LIMITATION

The research will acknowledge potential limitations, such as the limited number of Mobile Network Operators and Internet Service Providers. Researchers will be transparent about these limitations and interpret the results with caution. By employing a comprehensive research methodology, the study aim to provide valuable insights into the impact of networking and telecommunications on the living standards of citizens, contributing to a better economic and social growth of the role of digital communication in modern societies and offering practical recommendations for an inclusive internet and digital society.

CHAPTER FIVE

5.0 RESULTS AND DISCUSSION

The analysis of data collected from surveys and interviews revealed significant insights into the impact of digital divide on deprived citizens of Sierra Leone. The findings are presented below, followed by a discussion of their implications.

5.1 RESULTS

5.1.1 Operational Efficiency

The majority of survey respondents reported unimproved operational inefficiency in terms of internet availability in remote and rural areas

5.1.2 Cost-effectiveness

The pay-as-you-go pricing model and the high monthly tariffs of Internet Service Providers and Mobile Network Operators. The research showed that internet and digital technologies are much more expensive for the ordinary Sierra Leonean.

5.1.3 Scalability and Flexibility

This scalability improved service delivery and enhanced customer satisfaction. Digital technology and data communication provided with the ability to scale its services quickly in response to changing customer demands.

5.2 DISCUSSION

The findings disclose that millions of **students** in remote and deprived areas are forced to complete their assignments at home, **employees** cannot remotely work from home or even send periodic work report to head office, **pregnant women** and **children** need access to health care information and e-health service to increase their empowerment while practising preventive health care safety measures and pregnant women experienced social and structural barriers when accessing information, **farmers** need information about their products.

The poor you are the more expensive data costs, digital divide separates and disadvantages the poorest people and they are the ones that are most likely to benefit from having access to the internet. Without digital technology a country's potential for growth is hindered and making it even more challenging to compete in the world global economy.

Digital divide is a complex issue that affect the world. It is the discrepancy that exists between different demographics on access to information technology.

It is a situation where populations can have unlimited, good enough, or inadequate access to IT. In this context, information technology encompasses the internet, computers, telephones, and televisions. Also falling under this bracket are any other gadgets related to information technology.

Digital divide also captures the ability of different populace to leverage the internet, and various gadgets. Both governmental and private institutions, globally, have been fighting to narrow this divide.

6.0 RECOMMENDATIONS AND CONCLUSION

6.1 RECOMMENDATIONS ON HOW SHOULD WE NARROW OR BRIDGE DIGITAL DIVIDE

Developing nations are the ones world hit hardest by digital exclusion. Majority of these nations are investing in digital inclusion programmes. Both the young and the old can take advantage of such initiatives to educate themselves.

Based on the research findings, the following recommendations are proposed for narrowing digital divide:

- Promote innovations geared towards overcoming the digital divide by instituting a ***CELL TOWER COLOCATION POLICY***
  By collocating on an existing tower, wireless tenants can avoid the expense of building new towers, reducing their capital expenditure and saving time. We need to replace ad hoc ways of doing things if we want to fast narrow the digital cleave. It is possible to bridge the global digital divide if we promote innovative ways of doing business.

- Increase digital literacy

  Computer literacy is the ability to use a computing device, together with its associated hardware and software components, and the internet. We have for such a long time had a narrow view of what digital literacy entails.

  Thus, in order to bridge the digital divide, we must improve our digital literacy capacities based on the above-listed parameters. Societies should come up with programmes to address the existing deficiencies across various age groups.

- Provide operational incentives to information and communication technology entities

  Providing incentives relieves the burden encountered by such institutions. This responsibility especially lies with existing governments. There are various organizations fighting hard to narrow the digital divide. Sometimes, existing Laws and financial barriers thwart such efforts.
  A good example is a non-governmental institution focused on teaching SMEs how to integrate computing into their operations. A well-wishing government will chip in by minimizing the tax obligations of such institutions.

- Develop relevant and local content in addition to telecommunications infrastructure

  As individuals and communities, it is easier to learn and put in place concepts that we relate with and how to make it possible to bridge digital divide. The target audience should directly relate to the benefits they will enjoy from digital literacy.

  Take the example of a peasant farmer in some rural environment. He will invest in various skills associated with digital literacy influence him/her? What does he or she have to gain from such skills? How are they likely to streamline their daily activities and boost their status?

  With digital literacy, the countryman/woman can realise ways to boost his/her farming. The farmer can easily discover better ways of tendering crops. These benefits extend to even finding a good market for the farm produce, and much more. Furthermore, the farmer will soon discover how to make calculated risks through crop insurance. All such benefits are only workable in a digitally literate society.

- Encourage the establishment of cyber clubs

  How do you bridge digital divide by starting a cyber club? Deny yourself one or two luxuries which occasionally eat into your finances. Equally encourage your friends, families, and accomplices to follow in your footsteps. Consequently, channel the money you would have spent on the luxuries into one account. These funds should then be dedicated to spreading digital literacy. It could be for your kids or in support of any disadvantaged community out there.

- Establishment of workable partnerships between all information and communication technology entities and stakeholders

  More information and communication technology stakeholders should join hands in abating digital divide. These institutions should frequently and jointly drive various campaigns towards promoting digital literacy. Furthermore, the campaigns need to include all factors increasing the digital divide. Especially access and positive use of information and communication technology.

- Infrastructure Expansion, telecom companies should expand broadband infrastructure to reach remote areas devoid of their topography and population. Through initiatives like fibre-optic network deployment and satellite internet services, they will extend connectivity to even the most remote corners of the country

- Telecom companies should offer Affordable Access Programs for subsidised internet plans tailored to low-income households. This will tackle the affordability barrier. These programs should aim to make high-speed internet more accessible without compromising on quality, ensuring that cost isn't a prohibitive factor for those in need.

- Community Partnerships, collaboration with local governments, non-profits and community organisations plays a pivotal role in addressing the digital divide. Telecom companies should actively engage in partnerships to leverage resources and expertise, implementing tailored solutions that cater to the unique needs of each community.

- Develop a policy framework to analyse the development of digital technology.

- Digital technologies lower the cost of economic and social transactions. They promote innovation, boost efficiency and inclusion.

- Connectivity is vital, but not enough to realize the full development benefits. Digital investments need the support of other social factors, for instance adequate market rules, social digital skills and accountable institutions.

- Market competition, public-private partnerships and effective regulation of Internet and mobile operators encourage private investment that can make access universal and affordable. Public investment will sometimes be necessary and justified by large social returns.

6.2 CONCLUSION

The research concludes that networking and telecommunication have brought about significant positive changes in Sierra Leone.

Networking and telecommunication being the backbone to internet connectivity and digital technology**,** the ultimate goal of narrowing the digital divide is to inclusively provide every member of a society with an equal opportunity to benefit from internet connectivity and digital communication. Technology used creatively creates a significant difference in a community. Economically, a citizenry can easily network, learn new business ideas, and transact on a narrow or wider space.

The upcoming generation of students will experience better learning techniques as they can better access and use various learning tools available on the internet and a given population can discuss matters affecting them. They can make good political decisions as a country steering them towards success because only a few people are left in the dark.

Furthermore, the gap between the rich and the poor is likely to be narrowed. The poor, especially, will learn better ways of empowering themselves with consistent connectivity.

In conclusion, telecom industries, internet service providers and communities need to understand the role of technology in society, education on how computing or technology can be used to empower them and it impact on growing population.

I have shown that there exist a digital divide in the world and Sierra Leone to be specific due to communities having different levels of access to computing, technology and connectivity.

As long as the digital divide exists, those on the wrong side will not only have less power and quality of life in these areas, but will see the gap continue to increase as computing/technology continues its rapid advancement on human capabilities and society at large.

As a saying goes, the more people from a young age are expose to digital technologies and know how to use them, the more digitally competent our future generation of employees, client and society will be.

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