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THE AGA KHAN UNIVERSITY
Graduate School of Media and Communications

**A STUDY TO INVESTIGATE THE UPTAKE OF DIGITAL TECHNOLOGY
IN RUBEN FM RADIO STATION**

By

Nahashon Shisia Wasilwa
553315

A thesis submitted in partial fulfilment of the requirements for the degree of Master of
Arts in Digital Journalism

Nairobi, Kenya

20/02/2023
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APPROVAL PAGE

The Aga Khan University
Graduate School of Media and Communications

A thesis submitted in partial fulfilment of the requirements for the degree of Master of
Arts in Digital Journalism

Members of the Thesis Evaluation Committee appointed to examine the thesis of
NAHASHON SHISIA WASILWA-553315, find it satisfactory and recommended
that it be accepted.

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20/02/2023

DECLARATION

A STUDY TO INVESTIGATE UPTAKE OF DIGITAL TECHNOLOGY IN RUBEN FM RADIO STATION

I, **NAHASHON SHISIA WASILWA-553315**, declare that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university and that, to the best of my knowledge, it does not contain any material previously published or written by another person except where due reference has been made in the text. The editorial assistance provided to me has in no way added to the substance of my thesis, which is the product of my research endeavours.

Signature

Date

DEDICATION

I dedicate this work to my late mum Dinah and dad George.

ACKNOWLEDGEMENTS

I acknowledge my family for their unrelenting support accorded during the time, especially my wife Lucy Salome and children. Sincere gratitude goes to my supervisor Dr. Lydia Radoli, for her guidance and patience in making this dream a reality. I also appreciate my classmates who made the journey worthy and easy. Lastly, I am grateful for AKU –GSMC for allowing me to realise my dream in an enabling environment.

ABSTRACT

Having realized the potential of digital technologies, radio stations in Kenya have embraced technology to improve interactivity with their listeners. However, the extent to which digital technologies are used at radio stations and existing challenges and opportunities in uptake is yet to be established. The research's primary goal was to investigate technology uptake in Ruben FM radio stations. Specifically, the study sought to examine the extent of use of the existing digital technologies in Ruben FM radio station, explore other digital technology opportunities for uptake in Ruben FM radio station and establish challenges facing digital technology uptake in Ruben FM radio station. The study was based on Technology Acceptance Model (TAM). The study adopted a cross-sectional research design. The target and sample size were 20 employees at Ruben FM. The primary data was collected using both questionnaires and focus group discussions. Quantitative data were analysed using descriptive statistics such as frequencies, mean and standard deviation. Qualitative data generated from open-ended questionnaires and focus group discussions were analysed using content analysis. The study established that existing digital technologies are used daily to a greater extent at Ruben FM, including social media sites like Facebook, WhatsApp, twitter, Instagram and YouTube, podcasts, and radio websites. The study found various challenges facing digital technology uptake by Ruben FM radio station. These include power supply interruptions and limited access to the internet, among others. The study recommended that the management of Ruben FM radio station should ensure the installation of a backup generator to solve power supply interruptions. The study also recommended that the management of Ruben FM radio station should create an offline radio mobile app that will enable more people with android phones to access radio programs without using the internet.

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ABBREVIATIONS AND ACRONYMS

2G:	Second-Generation
3G:	Third Generation
4G:	Fourth Generation
AM:	Amplitude Modulation
CAK:	Communication Authority of Kenya
CMS:	Content Management System
EU:	Ease of Use
FGDs:	Focus Group Discussions
FM:	Frequency Modulation
KBC:	Kenya Broadcasting Corporation
NACOSTI:	National Commission for Science, Technology, and Innovation
NGOs:	Non-Governmental Organizations
NMG:	Nation Media Group
PU:	Perceived Usefulness
RF:	Radio Frequency
SM:	Social-Media
TAM:	Technology Acceptance Model
UK:	United Kingdom
UNESCO:	United Nations Educational, Scientific and Cultural Organization
USA:	United States of America

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

The concept of digital technology mainly refers to the process of synthesizing information in the form of numeric code using personal computers, mobile phones, communications satellites, and laptops (Allas & Hunt, 2018). Digital technology mainly refers to all types of electronic tools and uses numeric code to synthesise information (Zelizer, 2019). In most cases, the uptake of digital technology is associated with improved delivery of services in organizations. Notably, providing improved and high-quality services helps organizations streamline their operations and activities (Ndlovu & Sibanda, 2021). According to Zelizer (2019), digital technology is becoming a major component in mass communication as it augments the ability of mass communication agencies like radio stations to reach across borders and become a source of information where reliable news is scarce. Therefore, it is important to understand and examine the uptake of digital technologies in the operations of radio stations.

Radio stations have continuously embraced digital technology in their operations. Some new technologies that radios are adopting include online broadcasts, podcasts, and social media channels (Pham et al., 2020). New innovation offers awesome openings to community radio broadcasters and their audiences. Abimbola et al. (2019) posit that the Web may be a pragmatic structure for exacerbating local radio opinions so that they, too, can meet national, regional, and global phases. Nassanga, Manyozo and Lopes (2013) established that using innovations such as the Web and mobile phones have affected news coverage emphatically because it has improved data collection, handling, conveyance, capacity, and community engagement. This study

sought to investigate the uptake of digital technology in radio stations. To do this, the study specifically looked at the extent of uptake of digital technology, existing opportunities for uptake of technology and challenges that Ruben FM is facing in the uptake of digital technology.

1.2 Background to the Study

Digital technologies are electronic tools, systems, devices, and resources that generate, store or process data (Zelizer, 2019). Well-known examples include social media, online games, multimedia, and mobile phones. According to Hallett (2021), digital technology enables immense amounts of information to be compressed on small storage devices that can be easily preserved and transported. Digitization also quickens data transmission speeds. Digital technology has transformed how people communicate, learn, and work. The uptake of digital technology has played a key role in transforming journalism. Journalism has a strong tradition shaped by technological advances (Correia et al., 2019). Two decades ago, the growth of digital technologies such as social media and blogging platforms brought major changes in the media industry regarding audience engagement, news collection and distribution (Hund, 2019).

Digital technology adoption has transformed almost all aspects of life and firm activities in today's society, especially in mass communication through radio stations (Laor & Steinfeld, 2018). Radio broadcasting is the audio (sound) transmission, sometimes with related metadata, by radio waves to radio receivers belonging to a public audience. The uptake of digital technologies traces back to the 19th century (Marsh, 2020). The invention of the first smartphone sparked the very beginning of the digital telecommunication phenomenon we see today. The first smartphone was invented in 1994, but it was until the year 2000 that an actual connection with 3G

Internet happened. This made it possible for smartphones to perform functions like videoconferencing, and users can send huge files over the Internet. However, the smartphone revolution happened in 2007 when Apple introduced the first iPhone and Android phone in 2008 (Calaham, 2021). iPhones and smartphones running on Android allowed users to enjoy portable Internet, take photos and record videos. In addition to the mobile phone invention, the early 2000s experienced the sprout of popular social networking sites; Facebook (2004), Twitter (2006) and YouTube (2005). These online platforms allowed individuals and media companies to share content and interact with their audiences (Bolluyt, 2015).

The online platforms fundamentally changed how media houses could gather, process, and disseminate news to their audiences (Doyle, 2015). Across the globe, the uptake of digital technologies is changing the face of radio, especially in technologically advanced countries like the United States of America, China, and Europeans (Ndlovu & Sibanda, 2021). Theoretically speaking, radio is changing as a technology, and these changes have also brought about changes in radio practices and cultures, especially in news production. According to Mari (2018), digital technologies like the Internet and mobile phones have arguably multiplied and pluralized radio spaces. Radio is now a virtual, network, and mobile space while simultaneously remaining a physical space when conceptualized in its studio format where citizens can participate in public debate (Oni, 2015).

In Kenya, the internet was introduced in 1995 when only non-Governmental Organizations (NGOs) primarily used it to transmit and receive e-mails. It was not until 2000 that the government of Kenya realized that the Internet was an integral tool for development, prompting it to form the Communications Commission of Kenya to

regulate the sector (Mureithi, 2016). The author highlights the introduction of second-generation (2G) mobile phones that could access the Internet in 2002 and increased the number of people using the Internet. Mureithi (2016) argues that the rapid expansion of mobile phones with advanced technologies ranging from 2G to 4G and pervasive Internet access has significantly improved the Internet profession. This advanced communication has contributed to inventive augmentation of transmitting information to huge audiences. With the widespread use of the internet to disseminate content and commentary, modern communication thinkers and media groups are increasingly focused on integrating, disseminating, broadcasting, or advancing communication. The internet was invented to provide simple online direct connections to data, education, and leisure (Wamunyu & Wahutu, 2019).

Furthermore, the demonstration of these advanced technologies has improved mass communication and challenged its conventional concept of mass communication, which defines the origin of a systematic communication message as a humongous institution to whom the message is sent to a vast, diverse, widely dispersed crowd of individuals (Vargo & Guo, 2017). The importance of digital technology cannot be overstated. Data innovation has emphatically affected publicizing offices and radio stations to extend quality so they can effectively obtain information about clients across web research, generate their notification, and detailed photocopy replicas of it, regardless of the cost of duplicate (Bolluyt, 2015). Furthermore, transparent relations professionals can quickly deconstruct information gleaned from web research and other references and allow access to the administration. Besides this, media companies have increased their achievement by using information systems. They could indeed collect extra details and present news and information to their listeners through their website and other digital media. They can also use the media to poll their audience on various

issues. Similarly, news organizations use this technology to plan the pages of their publications and conveniently print hard copies (Mwaura, 2018).

The use of digitization by local radio stations increases the efficiency of their service delivery. In 1982, the Kenyan government and The United Nations Educational, Scientific and Cultural Organisation (UNESCO) collaborated to develop the nation's first public radio station in Homabay. Kenya now has over 30 radio stations serving specific communities (Kimani, 2017). Private organizations, academic institutions, and religious organizations own most community radio stations. They operate based on low-power transmitters of 50 -100 watts, shared frequencies, and limited coverage of 25 kilometres. Broadcasting news through community radio can help reach people easily.

Moreover, community radios can address their listeners directly, and their individual experiences and lives can be incorporated much better. Gustafsson (2016) explains that information is power, and insight can influence public discourse. Perceptions can be altered by access to media. On the other hand, a lack of information can make people anxious, restless, and easy to manipulate. According to Timalina and Pradhan (2019), community-owned radio stations help give people access to proper systems, which can result in social change. These are forums where members of the targeted community can discuss their problems and potential solutions (Timalina et al., 2019). Through such forums, members of the public hold local leaders responsible and encourage them to implement sound policies. Despite the importance of this market, Kenyan community media expansion has been stifled due to ongoing sustainable practices like funding, human capital, and content creation.

In addition, community radios, like their mainstream counterpart, continue to have their operations affected by technological changes. According to Mabweazara (2018), the interruptive effect of internet technology has affected the way news is generated, conveyed, and ingested is being felt in African newsrooms. Online technologies are transforming viewers' information requirements, and newsrooms and journalists are forced to conform differently. Linden (2017) states technology advancements impact journalism in four broad categories. These include: (1) how journalists do their work; (2) news material; (3) newsroom formation; and (4) the relationship between newsrooms journalist and their stakeholders. Like their commercial counterparts, community radios must embrace technological changes to survive in the dynamic media environment. Though radio station technologies come with many benefits, their uptake faces many challenges, and this study seeks to unearth them. In addition, the study sought to establish the extent of the use of digital technology in Ruben FM and determine the existing digital technology opportunities for Ruben FM.

1.3 Statement of the Problem

The uptake of digital technologies has revolutionised the operations of radio broadcasting stations across the globe (Marsh, 2020). Having realised the potential of digital technologies, radio stations in Kenya have embraced them to improve interactivity with their listeners, soliciting and receiving contributions from their listeners including insights, opinions, comments, compliments, and complaints (Mwaura, 2018). Some radio stations use digital technologies like social media to promote their programmes and direct the audience's attention to content, personalities or celebrities hosted on their live shows (Yacoub, 2019). However, the extent to which

digital technologies are used at radio stations and existing challenges and opportunities in uptake is yet to be established.

The survival of community radios depends on their uptake and usage of technology (Kimani, 2020). It is well-founded that the increasingly heterogeneous essence of televising implies that even the most commercial radio contenders, particularly in urban areas, will pull out insufficient competitors such as community radios (Mari, 2018). Furthermore, with the advancement of technology and on-demand content, traditional broadcasting on the FM wave band will eventually become obsolete (Shitemi, 2021). This is a suggestion that community radio stations focus on the future and accept modern technology in novel ways. One of the community radio stations in Kenya is Rueben FM, whose uptake of digital technologies is yet to be examined.

Ruben FM (99.9) is a community radio station in Mukuru slum, Nairobi County. The radio was launched in 2016 to help empower and unite the residents of Mukuru community through education, information, and entertainment (Kenya Community Media Network, 2022). To achieve this goal, the radio station needs digital technologies such as social media and mobile applications. It is perceived that the uptake of technology by radio stations like Reuben FM will bring significant advantages to them, such as enhancing interaction with the audience, facilitating improvement of the programs aired by the radio and addressing the geographical limitation set by the Communication Authority, among others. However, the extent to which Ruben Fm has adopted digital technologies and the challenges they face have not been investigated. Furthermore, the uptake of digital technologies at any radio station, including Rueben FM, is accompanied by implementation challenges that could be linked to inadequate staff and external challenges like the interrupted power supply.

Its, therefore, important to investigate the dynamics of the uptake of digital technologies at Ruben FM.

Moreover, limited studies have examined the investigative uptake of technology in radio stations. Some relevant studies have focused explicitly on using social media in radio productions, like Zakaria and Birikorang (2018) and Mwaura (2018). Hence, no single study has looked at all digital technologies, including social media, radio websites, Mobile applications, and podcasts. Furthermore, more specifically, none of the existing studies have looked at the case of Ruben Fm. This study sought to bridge these research gaps by investigating the uptake of digital technology in Ruben FM.

1.4 Objective of the Study

The research's primary goal was to investigate the technology uptake in Ruben FM radio station.

1.4.1 Specific Objectives

- a) To examine the extent of use of the existing digital technologies in Ruben FM radio station.
- b) To explore other digital technology opportunities for uptake in Ruben FM radio station.
- c) To establish challenges facing digital technology uptake in Ruben FM radio station.

1.4.2 Research Questions

- a) To what extent has Ruben FM taken up digital technology in its operation?

- b) What other digital technology opportunities should Ruben FM radio station adopt?
- c) What challenges face digital technology uptake by Ruben FM radio station?

1.5 Justification of the Study

Radio and current information and communications technology are now merging. People are listening to the radio on their computer systems via the Internet, on their MP3 players via podcasts, and on their cell devices in more significant numbers. A few radio stations no longer broadcast conventionally and only arise online. Radio stations that fail to adapt or take advantage of digital technology face the threat of becoming irrelevant regarding audience engagement and generating revenue online. The adoption of digital technologies is perceived to have an impact on the operations of radio stations, and most researchers have concentrated on this and have failed to examine the extent to which they have been adopted. Despite various technologies available for adoption by radio stations, there is still little evidence showing the level to which these radio stations adopted the existing digital technologies. Hence, this study sought to provide evidence on the extent of use of the existing digital technologies and the challenges facing digital technology uptake.

Moreover, community radio stations continue to attract the attention of researchers, given their important role in society. While Orina (2011) examined the obstacles to establish and run community radio stations in Kenya, the research did not discuss technology adoption or related issues. Similarly, many research findings have emphasized the role of society radios in peacebuilding rather than their adoption of digital technology (Mwanzia, 2017; Gustafsson, 2016). Community radio is Kenya's newest segment of the television industry (Kimani, 2017). The author observes that it

faces challenging issues and vagueness about its material and features. Kimani explains the need to highlight community broadcasters' constraints through research and the need to understand how they operate in the Kenyan context. This study, therefore, sought to investigate digital technology uptake by Ruben FM.

1.6 Significance of the Study

The results of this analysis could benefit Ruben FM's management, from which they can know their strengths and weakness in digital technology. The study is focused on Ruben FM because it is in the slums of Mukuru Kwa Reuben, where major social challenges remain unexposed due to the limited uptake of technology. Hence the uptake of technology like social media would help in voicing out these social challenges through live shows and constructive engagement with the audience from the area. The radio helps empower and educate the community hence a good research site for the study. It may be important for the journalists working for the radio station to understand the significance of digital technology in their operation and give insights on the best existing digital technologies they can adopt for better interaction with listeners. This is because the study may act as a reference point of future studies associated with the uptake of digital technology in radio stations.

Additionally, it may guide other community media houses and media outlets on using digital technology in operations. Further, the study could help contribute to existing research on digital technology. Lastly, it may be useful to policymakers and regulators of radio stations in Kenya. This is because policymakers may use the study findings to develop appropriate policies to ensure the adoption of the best digital technologies that enhance the operations of radio stations.

1.7 Scope of the Study

The research focused only on digital technology uptake by Ruben FM. The study specifically looked at the extent of uptake of digital technology, other digital technology opportunities, and challenges facing digital technology uptake in Ruben FM. The researcher engaged the senior and minor staff to collect data through questionnaires and focus group discussions.

1.8 Limitations of the Study

The COVID-19 pandemic has disrupted workplace routines, with many employers demanding that their staff work from home. The researcher observed Ministry of Health guidelines such as keeping social distance and ensuring that the data collection meeting does not pose any health threats. Additionally, the researcher hopes the Station's management was free to share and provide necessary information relevant to the research completion.

1.9 Operational Definition of Terms

Community: In this report, it refers to a group of people living together in one area.

Community Media: Any construct of media made and governed by a geographical society or a society of personalities, such as print media, though broadcast has received the most attention in Kenya.

Community Radio Station: Refers to a local, non-profit, participatory radio station operating within a specific geographical area with a development agenda.

Digital media: Any constitute of media which is distributed through digital equipment. There is use of electrical gadgets to generate, display, modify, and disseminate information.

Non-Governmental Organization: Organizations that are operated independent of the government or state. Most of them are not-for-profit and focus on serving the general public through provision of some services and products.

Social Networking Sites: Internet sites or websites which enable readers to access, televise, or make a public portfolio and communicate online to others

Digital Uptake: The level at which the station (Ruben) has embraced digital technology.

Feedback: The views and opinions shared to the station by listeners after the program has aired.

FM - Frequency Modulation: A broadcast that changes the carrier frequency wave and necessitates the use of an FM receiver.

Radio Frequency (RF): A signal telecast by an AM/FM radio channel.

Script: A written article that the host reads during a show.

Promo: It is a marketing strategy that is short for promotion of a product or service

Diaspora audience: Targeted listeners who live outside Kenya

Newsroom: A place/office where information/news is gathered and prepared for publishing or broadcasting

Digital media: Any type of media that is created, transmitted, viewed, and stored using an electronic device.

1.10 Summary

This chapter outlines the research subject, the study's background, and the problem statement. It also describes the study's justification, significance, and assumptions, as well as assumptions, scope and limitations. The research questions and objectives emphasize the research's emphasis. The next chapter discusses the literature review, encompassing the theoretical framework, emerging research gap and conceptual framework. Further, the research report comprises the methodology adopted for the study, followed by Chapter four on data presentation and analysis and discussions on the findings from the study. Last but not least, the research comprises references and appendices of the whole study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

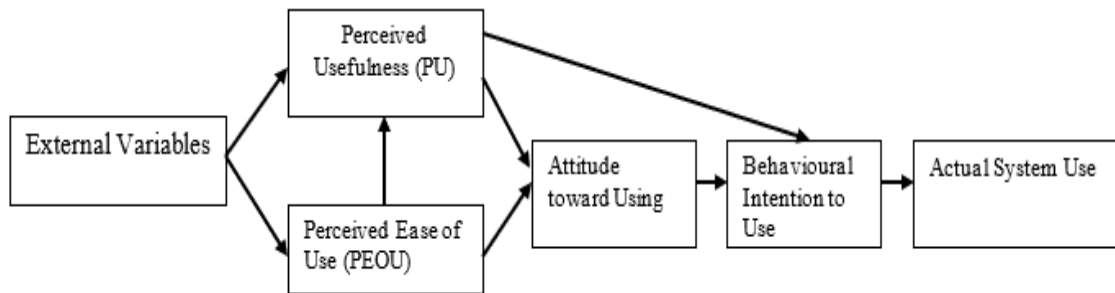
This section addresses accessible digital technology literature. It analyses in detail publications and materials on the uptake of digital technology by newsrooms, opportunities for digital uptake and existing challenges on the adoption of the same by media houses.

2.2 Theoretical Framework

A theoretical framework is a foundational review of existing theories that serve as a roadmap for developing the arguments the researcher uses for their work. The study was based on Technology Acceptance Model (TAM).

2.2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model “was originally conceived by Fred Davis in his doctoral thesis in 1985 and suggested that an individual’s motivation to use a technological device is influenced by the system’s features and capabilities (Marangunić & Granić, 2015). The technology acceptance model (TAM) is an information systems theory that models how users accept and use technology. The existing system used is the endpoint where people use the technology. Behavioural intention is a factor that leads people to use technology (Silva, 2015). In the model, there are two determinants, namely perceived ease of use and perceived usefulness. Other components of the TAM model include external variables, attitude towards technology use and behavioural intention to use technology, as shown in Figure 1.



(Source: Davies et al., 1989)

Figure 1: Technology Acceptance Model

The model suggests that when users are presented with a new technology, several factors influence their decision about how and when they will use it, notably: *Perceived usefulness* (PU) is the degree to which an individual believes that using a particular information technology will enhance his own performance (professional, personal). It means whether someone perceives technology as useful for what they want to do (Fayad & Paper, 2015). *Perceived ease-of-use* (PEOU) is the degree to which a person believes using a specific information technology will be free of effort. If the technology is easy to use, then the barriers are conquered. No one has a positive attitude towards it if it is not easy to use and the interface is complicated. *External variables* such as social influence are important factors in determining attitude. When these things (TAM) are in place, people will have the attitude and intention to use the technology. However, the perception may change depending on age and gender because everyone is different (Balouchi & Samad, 2021).

The TAM has been used in several studies to explain and conceptualise technology and the motivation for adopting these interactive platforms for news production. Deo-Silas (2013), for instance, employed the TAM to examine how newsroom journalists across various media houses in Ghana, including radio, use social media for their routine journalistic practices. The readiness level of any individual

towards accepting technology must be considered an inhibitor or enhancer in the adoption process. Blut and Wang (2020) developed a multidimensional typology based on underlying positive and negative technology beliefs. More precisely, TR measures the individual's readiness to use new technology using four components: optimism, innovativeness, discomfort, and insecurity.

Davis (1989) noted that future technology acceptance research must address how other variables affect the technology's usefulness, ease of use and uptake. In the case of uptake of digital technology, two significant determinants determine the uptake behaviour, that is, perceived ease of use (EU) and perceived usefulness (PU). Within the digital technologies circles, users of platforms such as Facebook, Twitter, and Flickr may be motivated to use them because they help meet the individual's related needs. The importance of perceived EU signifies the degree to which an innovation is perceived not to be difficult to understand, learn, or operate (Blut & Wang, 2020). This theory is relevant to this study as it helps explain the process influencing the uptake of digital technology by radio stations. It means that, for radio stations adopt digital technology, they must look at its usefulness, available opportunities for its uptake and any existing challenges that may affect the uptake of digital technology.

2.3 General and Empirical Literature Review

2.3.1 *Defining Community Radio*

Various definitions of community radio share many common elements. According to Amarc International, an umbrella organisation for community radio worldwide, community radio stations are characterised by their limited geographical coverage, active community participation in content production, and non-profit activity ("What is Community Radio", n.d.). Community radio, as opposed to commercial and

national radio, which telecast to most audiences, serves small or minority populaces (Khan et al., 2017). Community radio is Kenya's newest broadcasting sector (Kimani, 2017). The author explains that it is faced with sustainability challenges. One of the community radio stations in Nairobi County is Ruben FM.

Ruben FM (99.9) is a community radio station in Mukuru slums, Nairobi County. The radio was launched on 19 November 2016 (Kenya Community Media Network, 2022). The radio station aims to help empower and unite the residents of the Mukuru community through education, information, and entertainment. The vision of the radio station is to empower and unite the Mukuru Community. Its mission is to offer quality educative, informative, and entertaining programs to Mukuru Community. Programs at Ruben FM tackle various pressing issues in the community. Some of the issues tackled in the programs include Local politics, Health, Nutrition, Human Rights, Education, Relationships and lifestyle, Gender-Based Violence, Sports, Environment and Infrastructure, Youth empowerment, Women empowerment, Parenting, and Insecurity, among other issues. Staff and Volunteers at Ruben reside in the Mukuru area, meaning that they understand well Mukuru community hence providing appropriate content to the community (Kenya Community Media Network, 2022).

2.3.2 Defining Digital Technology

Digital technologies are electronic tools, systems, devices, and resources that generate, store or process data (Zelizer, 2019). Well-known examples of new and emerging technology include social media, online games, multimedia, and mobile phones. Digital learning is any learning that uses technology. It can happen across all curriculum learning areas. Transformative digital change has enabled news organizations to report, edit and publish information faster (Hallett, 2021). However,

the digital revolution also presents journalistic challenges. These include how to shape content to engage an attention-challenged news audience and how to anticipate what technologies to invest in. For instance, mobile technology has a huge potential in content distribution, citizen participation, and access to information (Correia et al., 2019).

The uptake of digital technology has led to the emergence of digital media. Media is a technique for transmitting information. Digital media is information consumed or encrypted using a computer forum, electronic gadget, or screen (Delfanti & Arvidsson, 2019). It can be described as a media type created, transmitted, viewed, or stored using an electrical gadget. Media technology is a tool that can be used to compose, create, produce, deliver, and manage audio, images, and texts. Even though radio stations are technology themselves, they need digital technologies to reach every listener as the world is changing with technology. Examples of digital media technology include websites, tech devices, blogs, YouTube and social media like Facebook, Twitter and blogs (Laor & Steinfeld, 2018).

2.3.3 Investigate the extent of uptake of digital technology by Community radios

Community radio stations constantly adjust to technological challenges, such as going from simple to advanced. Numerous also utilise the Web to extend their scope and reach (Stewart et al., 2019). Furthermore, numerous radio stations utilize and take advantage of different portable applications, enabling the open to get to their programming and associated with the radio (Cojti & Portalewska, 2019). Similarly, numerous radio programs are being transferred to different advanced stages, making chronicled data that clients can access without time limits. Moreover, radio stations embrace better data gathering, production, dissemination, and income-era approaches.

This can be seen in their developing utilisation of social media stages like Facebook, YouTube, Instagram, and Twitter, among others, as stages of coming out to audiences (Mwongela, 2015; Hlatshwayo, 2017).

Community radio stations are critical as they help maintain further minority culture. The decay of community media can lead to the misfortune of neighbourhood news coverage and the homogenisation of culture (Stewart et al., 2019). Media houses that run radio stations have shaped advanced divisions entrusted with working their websites and social media handles. The widespread use of social media has increased online movement by media organizations, resulting in the adoption of previously unutilized strategies for grouping, planning, and disseminating news worldwide. In some instances, newsrooms rely on internet users for genuine event updates. In areas where reporters do not have entry or cannot cover what is going on, they turn to social media for information (Mofokeng & Rambe, 2017).

A flourishing telecom industry and the wide availability of Internet-enabled cell devices have facilitated the growth of social systems in the local context. Media companies use new media tools to supplement their older devices or standalone platforms such as websites (Rambe & Madichie, 2020). Local media outlets, like Criterion, use their webpage to direct traffic back to TV, radio, and newspapers. Technology innovations have a disruptive effect on how African newsrooms create and disseminate information. Tanja (2014) realized that technology has influenced the routine tasks of South African society reporters, who are progressively dependent on the internet for headlines. Community radio's utilization of social networks (Facebook and Twitter) has resulted in higher equality and engagement for such online audiences. Nation Media Group and Standard Media Group journalists have endorsed using social media for news generation and dissemination.

The growth of the internet has changed how newsrooms all around the globe function. According to Mwangela (2015), social networking has become a vital part of Kenyan newsrooms, and media organizations have created social media guidelines. According to the author, the Nation Media Group and Standard Group have social networking policies to govern how employees deal with the firm's social media profiles. Journalists like SM because it provides quick feedback on stories. Audiences who follow a media organization's social media pages can interact with articles posted on these systems. The electronic method, in which narratives are first submitted for online platforms, has been endorsed by media outlets to break the news to their viewers.

In Spain, Esteban and Esteban (2016) argued that radio stations have mobile applications that allow listeners to tune in and access various radio broadcasting content and programs. Ndlovu and Sibanda (2021), while studying digital technologies and the changing journalism cultures in Zimbabwe, established that despite challenges of resources such as finances, internet access and lack of protective gear, Zimbabwean journalists increasingly relied on interactive digital tools such as WhatsApp and Twitter to generate story ideas, conduct diary meetings, and for virtual sourcing.

Social media enhances interactivity between on-air radio presenters and their listeners. A study by Mwaura (2018) on the impact of social media on radio content and programming in Kenya Broadcasting Corporation radio stations. The study revealed that on-air radio presenters at KBC used social media to interact with their audiences assets set up an appropriate infrastructure for listeners to interact with on-air presenters and fellow listeners. Social media platforms also allow one-to-one or one-to-many communications to take place and many-to-many and many-to-one communication. While studying the effects of social media on the content of local television programs like Citizen TV's gospel Sunday show, Ouma (2013) established

that social media, to a greater extent, affects the way local television programmes are tailored. If granted by the programme hosts, the feedback the audience gives in the form of song requests and suggestions indicates that social media affects the final product.

2.3.4 Explore Opportunities for Digital Technology Uptake by Community Radios

The use of digital technologies in journalism offers numerous opportunities for newsrooms, from how news is produced, broadcasted, and received by audiences (Mabweazara, 2014). Media managers can use data derived from digital platform dashboards in decision-making. For example, the United States publication ‘The New York Times’ is credited with leveraging digital data to create rich content that resonates with its audience (Leonhardt et al., 2017). This, notably, led to a growth in its digital subscribers and revenues. Lewis and Molyneux (2018) argue that online audiences are a plausible source of revenue for traditional media houses.

Additionally, technology offers media houses analytical tools such as Chartbeat, Orphan and Lantern to gauge audience behaviour with content. Monitoring and measuring the performance of stories have made media organizations engage in digital listening, monitoring and in the packaging of content which interests the public. Community radios can use the insights obtained from analytical tools to improve their content and interaction with their audiences (Bosch, 2016).

Community radios can increase the democracy space in their jurisdictions by providing online spaces for discussions. The use of social media, particularly, has broadened the democratic space in African countries by allowing more people with different views to participate in the news gathering and dissemination (Leijendekker & Mutsvairo, 2014; Hlatshwayo, 2017; Motsaathebe & Chiumbu, 2021). Citizen journalism bypasses the traditional gatekeeping practices in mainstream media, where

the process is highly controlled. Thanks to digital media, users can now become more directly involved with politics and contribute to social change. According to Tong (2017), the use of digital tools by Greece's online news outlets has resulted in more fact-accurate and straightforward breaking news, with many reporters forced to be more observant of the overall public's preferences than before. In addition, Tong (2017) asserts that internet-based news outlets occur to produce a level of transparency and notoriety, which limits the political class' power to control public perception of events.

Local media houses are boldly embracing digital media in all aspects of operations, from newsgathering and dissemination to revenue generation. They are investing in digital platforms to tap into the benefits associated with them. In 2020, Nation Media Group, East and Central Africa's biggest media company, transformed into a fully digital brand with the launch of its flagship website, nation.com, in line with global trends (Sang, 2022). The media house said its greater focus, moving forward, was on growing reader revenue from content delivered digitally. Nation Newspaper and The Standard Newspaper 2021 introduced paywalls on their websites, forcing readers to pay for content (Sang, 2022). Media houses must charge audiences for premium content to increase their revenues.

Digital technology has enabled the introduction of newsroom convergence. The blending of seemingly disparate media platforms and technologies via digitalisation and computer networking is called newsroom integration. (Moore & Tambini, 2018). Technological convergence's benefits include simplifying the production and distribution of media content and cost-saving (Lewis & Molyneux, 2018). Moore and Tambini (2018) explain how consolidated newsrooms increase the public's ability to be notified and engaged in a narrative. Moreover, it provides journalists and editors with

more interactive storytelling tools. Community radio stations, such as Ruben FM, can decrease expenses through integration. The Internet provides media houses with access to gigantic new audiences. Newsrooms can grow and retain audiences willing to consume content online through their websites and social media sites. According to Mare (2013), media audiences have become influential players in media content. They must be contacted, heard, and allowed to partake in the news-making procedure. Local media companies, such as Nation Media Group, have Content Management System (CMS), allowing them to choose content from various news sites and place it in a consolidated console (Foust, 2017). This way, the audience can get various news from a single platform, thus saving effort and time.

Digital media allows for diverse content that consumers can easily access everywhere, at any time, using various devices such as tablets, smartphones, and laptop computers (Bosch, 2016). Social media presents traditional newsrooms with extended newsgathering capabilities, leads on stories, and redirects to websites or broadcasts (Mwangi, 2021). Through social media, community radio journalists can widen the impact of their journalism by providing platforms for crowd-sourcing and sharing their reporting. The technology issue for radio announcers stays the same for the past decade: how to merge live stream radio with local advanced innovation media to utilise radio's traditional attributes. With constantly changing phases, frameworks, security considerations, and so on, the newer generation is much more complex and costly than traditional broadcasting. Many bequest media organizations have chosen to address this issue by utilizing large promoting stages like Facebook, but this is frequently a short-sighted approach. Instead, community radio stations should recognize the tremendous opportunities in embracing advanced technology (Esteban & Esteban, 2016).

Radio announcers must not send their viewers to third-party systems that mine performance measures from those viewers with their advantage, leaving media companies without the metrics they need (Marsh, 2020). Instead, community radio stations should use digital technology to improve the sound quality for their listeners and the newscaster. It is not the goal of large third-party internet advertising systems, but given the complex nature and cost of building rich, modern digital sites, television companies have few options (Shitemi, 2021). A study conducted by Mwangi (2021) on appropriating new digital technology in community radio broadcasting in Kenya based on Realist FM found that community radio stations are using digital technologies on various platforms in their broadcasting. The study established that despite the digital divide's challenges, community radio stations are adopting digital technologies to enhance their activities and provide greater opportunities for access and participation to their audiences. The convergence of the internet and radio presents greater opportunities for creating local content relevant to the local community's needs, propagating the local culture and presenting content in the local languages. This study demonstrates that convergence between the internet and radio has had an impact on the audience as well as on broadcasting. New digital technology in the radio station under study seems to be a tool in the radio station's work as well as a factor that enhances the better performance of tasks (Mwangi, 2021).

2.3.5 Establish Challenges Facing Digital Technology Uptake by Community Radios

Although the use of digital technologies has unlocked new platforms for news production and distribution, numerous challenges are still associated with its use. Most communal radios are in the rural or urban slum (Shitemi, 2021). It poses a challenge to the issue of the digital divide. Despite the need to adopt digital technology, community

radios have a huge gap, with some of their audience not digitally literate. Therefore, they aim to build a relationship first and have a gradual transition. For example, rural areas have a slow technology uptake due to poor networks and lack of resources. The uptake of digital technology by community radio stations is greatly inhibited by lack of the electricity or regular power supply, the high fees charged by the service providers (internet and telephone), as well as the high cost for the ICT equipment, maintenance expenses and operational costs (Rahman, 2016).

According to Mare (2013), given Africa's irregular economic growth, access to knowledge and news remains a key obstacle for underprivileged areas like remote and slum regions. Selection of innovation by the community radios is additionally a costly undertaking. The tall taken toll of information bundles required to get to the Web and social media stages is past and implies numerous ghetto tenants counting (Ntibinyane, 2020). Furthermore, African youth are more dynamic clients of computerized media than in past eras. The last mentioned may feel cleared out of the online dialogues, which mostly target adolescents. Since media companies have endorsed digital media innovations, most are still grappling with the cost improvement issues arising from the digital rebellion (Rahman, 2016).

Few instances of establishment media benefit from their online media operations due to competition for focus and advertising, and few people pay for online news (Bor, 2014). Advertisers have been hesitant to follow media data. The internet instead of directly advertising with Facebook, Twitter, Google, and other large platform companies. The traditional media business model has become more complicated because of this. This, nevertheless, has no bearing on community radio stations, which rely on Nieldonations rather than advertisements to fund their processes. Take-up of innovation is expensive in terms of staff preparation and modern contracts. Past ponders

appear that substance advancement for diverse online stages requires Web innovation and computerized aptitudes (Spilsbury, 2014). Writers must utilise online strategies to accumulate data, and make, spread, and dissect information on diverse media stages. Given the energetic nature of advanced media, neighbourhood community radio stations can discover it exorbitant to retrain or rehire modern staff (Bor, 2014).

According to Mabweazara et al. (2014), moderation, which needs both technical and human resources, is a huge task for largely understaffed newsrooms. Initially, the recruitment of audio-visual reporters in newsrooms was resisted, even as the old guard fought hard to keep the status quo (Mare, 2013). Resistance can be tamed through effective change management implementation. Advanced take-up requires a carefully thought-out usage technique, including all the staff. Morris and Ogan (2018) set up that need for communication, departmental battles, the need for approaches, structures, battle over assets, and distinctive generation cycles are a few challenges confronting merged newsrooms. More so, utilizing of modern innovation can lead to an expanded workload and a clash in work morals. Newsrooms must make room for criticism when executing unused changes to illuminate a few of the previously mentioned challenges (Mare, 2013).

Nassanga et al. (2013) established that using innovations such as the Web and mobile phones has emphatically affected news coverage because it has improved data collection, handling, conveyance, capacity, and community engagement. In any case, the study found that rural community radio stations confront a few challenges in the take-up of innovation incorporate high expenses charged by benefit suppliers, high cost of gear, tall operational and support costs, and the need for normal control supply. Punnett (2016) argues that one challenge has been the traditional media executives

being slow to embrace digital platforms and seeing them as less valuable to audiences. He cites executives in countries like Australia and the United States of America (USA) as calling blogs parasites and devoid of intellectual rigour in their content. He adds that the failure to recognize the potential and public demand for new forms of content and distribution methods has led them to trail in tailoring content to the Web 2.0 environment of social media and social networks (Nassanga et al., 2013).

This section highlights community media broadly, along with any media generated and monitored by a geographical community or a community of personalities. Print media is included, though broadcast media has received the most attention in Kenya. Most importantly, the Kenyan Communication Authority appears to have adopted this broad definition, as demonstrated by the different stations. All local radios are restricted to a 3km radius. It guarantees that they stay focused on local matters pertaining to the live viewers and stations work nearby (Kanayama, 2021). Apart from organisational community media endorsed by institutions such as universities, Kenyan community media necessitates state support, such as infrastructural development and tax breaks. The industry lacks data on what was done, what has worked, and whatever has failed, but what remains to be done. With the advent of scientific progress, In Kenya, there is a need to protect and build social media.

2.3.6 Emerging Research Gap

Various studies have been conducted in relation to the uptake of technology in radio stations. For instance, Ndlovu and Sibanda (2021) studied digital technologies and the changing journalism cultures in Zimbabwe, and a study conducted by Mwangi (2021) on appropriating new digital technology in community radio broadcasting in Kenya based on Realist FM found that community radio stations are using digital

technologies on various platforms in their broadcasting. Nassanga et al. (2013) established that using innovations such as the Web and mobile phones have emphatically affected news coverage because it has improved data collection, handling, conveyance, capacity, and community engagement. Moreover, Zakaria and Birikorang (2018) looked at social media and radio news production in selected radio stations in Ghana and Mwaura (2018) looked at the impact of social media on radio content and programming in Kenya broadcasting corporation radio stations. However, the existing studies have only focused on a few digital technologies like social media.

Moreover, none of the existing studies have concretely established the extent of uptake of digital technologies in community radios. The studies have also not established the opportunities and challenges of the uptake of digital technology. This study seeks to bridge these research gaps by investigating the uptake of digital technology in Ruben FM.

2.4 Conceptual Framework

A conceptual framework is the natural progression of the phenomenon to be studied. This comprises the dependent and independent variables. In this case, the dependent variable is the uptake of technology by community radios. The independent variables are the extent of uptake of digital technology, opportunities in digital technology and challenges affecting digital technology. From the conceptual framework, there is a linear relationship between the variables. This implies that the uptake of technology by community radios, as explained by the technology acceptance model (TAM), depends on the extent or degree of uptake, existing opportunities in digital technology and challenges affecting digital technology uptake. The conceptual framework is shown in Figure 2.

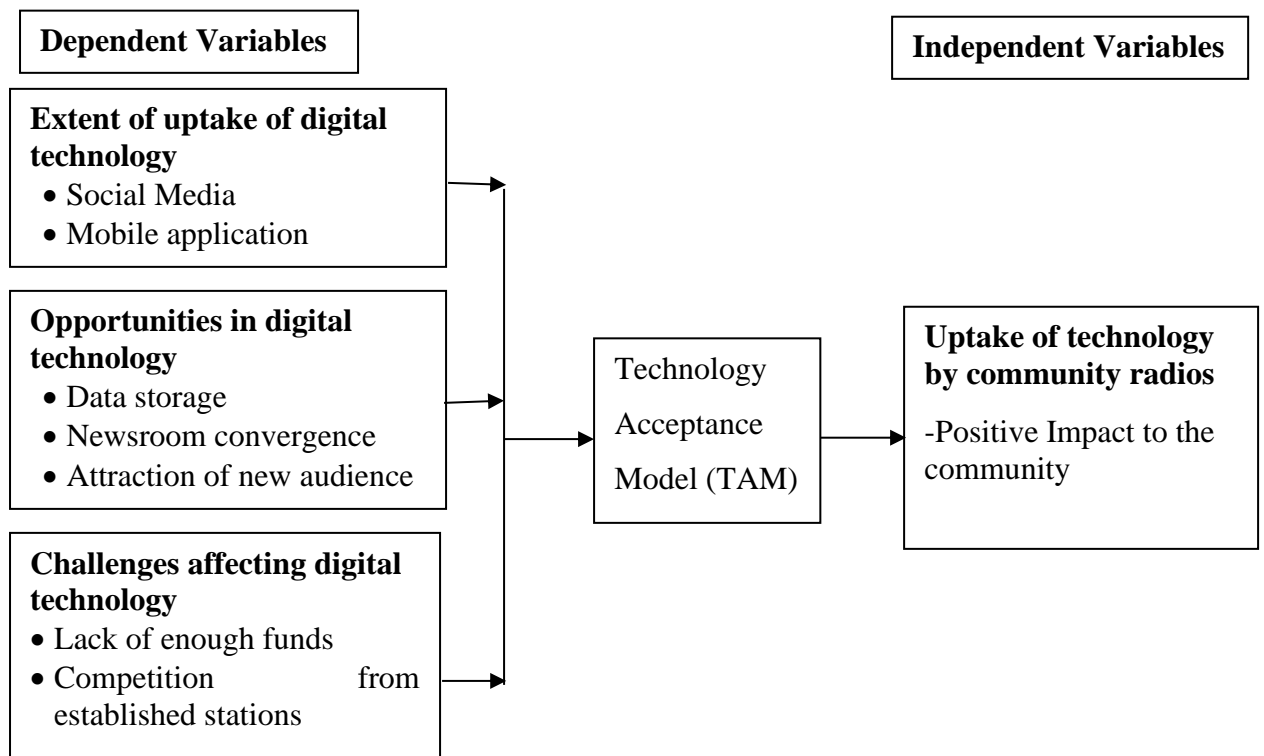


Figure 2: Conceptual framework

2.5 Summary

This section discusses the framework used to base the study on the diffusion of innovations theory. The section goes over the empirical review as well as the conceptual framework. The Independent variable means it is a stand-alone variable. In this study, ‘uptake of technology by community radios’ is the independent variable. Dependent variables depend on other factors measured. In this study, the dependent variables are the extent of uptake of digital technology, Opportunities in digital technology, and challenges affecting digital technology. There has been a discussion on the available literature on the uptake of digital technology, opportunities, and challenges. Furthermore, it addresses the research gap based on the literature review.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design, approaches and methods used to collect and analyse the data. It entails the population, sample size, sample selection, data collection method and analysis to achieve the study's objectives. The study was meant to investigate technology uptake in Ruben FM radio station.

3.2 Research Approach and Research Design

The research approach was mixed methods, whereby researchers collected and analysed quantitative and qualitative data within the same study. The qualitative data was collected using focus group discussions, while quantitative data was collected using research questionnaires. The research approach coincides with the cross-sectional research design that the study adopted. The research design also entailed the collection of both qualitative and quantitative data. This was action research, where the researcher collected and analysed quantitative and qualitative data within the same study. A cross-sectional design entails a one-time study of topics with no follow-up. This research design was used because data was obtained inside a radio station, which is a one-time study (Spector, 2019). The cross-sectional approach was important for this research because the study intends to investigate the extent to which Ruben FM radio stations have adopted digital technologies like social media and YouTube, opportunities for digital technology uptake and challenges faced during the uptake of digital technology up to the time of data collection. This was essential to the topic since the design allows researchers to scrutinize technology adoption in community radio stations by analysing the current scenario and the opportunities if the radio fully embraces technology.

3.3 Population

The general study population was five community radio stations based in Nairobi slums (Pamoja FM of Kibera slums, Ghetto FM of Mathare slums, Mtaani Radio of Riruta Satellite, and Koch FM of Korogocho slums). Community radio is usually a short-range, not-for-profit radio station or channel that caters to the information needs of people living in a particular locality, in the languages and formats most adapted to the local context. Ruben Fm seems to have adopted various technologies; however, the extent of uptake, challenges facing uptake and opportunities for uptake have not been established. Hence the study selected Ruben Fm to establish these facts. The study intended to collect data from staff working at community radio stations. The staff at the radio station was selected because they are knowledgeable on the uptake of technology in radio stations.

3.4 Target Population

Garg (2016) avers that the target population is the individuals from whom the intervention intends to conduct research and draw conclusions. The study targeted Ruben FM radio to represent community radio in Nairobi slums in Kenya. Ruben FM radio station is considered a community radio because it has been assigned Mukuru slums as the broadcasting area by the Communications Authority of Kenya (CA). It is also a not-for-profit radio station for offers quality educative, informative and entertaining programs to Mukuru Community Programs at Ruben FM tackle various pressing issues in the community. The number of all employees working at Ruben FM was 20. Hence, the target respondents were 20 employees working at Ruben FM radio station. These were selected because they have adequate knowledge of the uptake of digital technology in the radio station. The management staff and Public Relations were

targeted for focus group discussion to offer valid discussions on the uptake of digital technology on the radio.

3.5 Study Site

The study focused on Ruben FM because it is a popular station in the slums of *Mukuru kwa Reuben*, Nairobi, Kenya. Ruben FM was selected because its focus is to empower and unite the residents of the specific geographical area that is Mukuru slums through informing, educating, and entertaining the listeners. Another reason was that Ruben FM is in the slums where negative social issues shape socialization and have played a huge role in highlighting issues affecting the residents of Mukuru slums. Therefore, the uptake of technology by Ruben FM could have more influence in the community hence becoming an agent of positive change.

3.6 Sample Size

A sample is a set of entities drawn from a population to estimate the population characteristics (Collins et al., 2016). The study adopted the total population sampling technique (census), a type of purposive sampling where the whole population of interest is studied. The sampling technique was used because the total population is small and manageable. Hence, the sample size for the study was all the 20 employees working at Ruben FMs, including the junior staff, senior staff, and the public relations staff at Ruben FM. These were selected as they can give credible information without repetition and saturation.

3.7 Sampling Procedures

Sampling involves selecting a portion of people from a whole group to approximate the target population (Schreier, 2018). The study selected the respondents using a total population sampling technique. This is a type of purposive sampling where

the population of interest is studied. The sampling technique was used because the total population is small and manageable. Inclusion involved management, senior staff, and public relations office staff willing to participate in the study. The staff was either male or female.

3.8 Research Method

Research methods are ways of collecting and analysing data. The primary data was collected using both questionnaires and focus group discussions. The questionnaires were administered to all employees. The questionnaire had both open and closed-ended questions. The open questions are utilized to ensure that participants provide an in-depth answer without limitation, and the closed questions enable the participant to reply from the limited choices that have been identified. As per Patten (2016), the open-ended questions provide a thorough answer from respondents. The study used questionnaires to preserve time and money and expedite an easier analysis as they are immediately usable. Because the questionnaire may limit the respondents in giving information, the study also used focus group discussion for data collection. Focus group discussion involves gathering people from similar backgrounds or experiences to discuss a specific topic of interest. Since there are only 20 staff working at Ruben FM, around 10 respondents were engaged in a focus group discussion to get more in-depth information on the uptake of digital technology like social media, mobile applications and podcasts at Ruben FM. The FGDs were used to supplement the information or data obtained using the research questionnaires.

3.9 Data Generation/Collection Tools

Data gathering tools make it easier to gather data. The main data collection tools for the study were a research questionnaire and focus group discussions. The study

gathered both qualitative and quantitative. This is because the study research questions cannot be fully answered by either quantitative or qualitative data alone hence the need for both. Data was obtained through focus groups and the completion of open-ended questionnaires. Ruben FM has 20 employees. The research questionnaire was self-administered to 20 people and then analysed. The queries were related to the study objectives. The questionnaire was considered because it takes less time to oversee and has less chance of bias because it is presented consistently. Ten of the 20 participants were randomly chosen to form two focus groups with five members each to gather more information about the uptake of digital technology.

3.10 Data Collection Procedures

The researcher first sought approval from Ethics Review Board and then obtained an introduction letter from the university. The research then applied for a research permit from the National Commission for Science, Technology, and Innovation (NACOSTI). These were presented to authorities for permission to collect the essential data from the participants. The questionnaires were administered to the employees at Ruben FM radio station. To offer respondents adequate time to give thoughtful responses, the researcher employed a drop and pick later method in administering the questionnaire. In this method, the employees were left with the questionnaires to fill, then collected back by the researcher after two days. This method was adopted to give the respondents adequate time to respond to the questions in the questionnaire. The focus group discussion, it was face-to-face engagement. The FGD helped get more information regarding digital technology uptake at Ruben Fm. The researcher gathered the 10 respondents, and they sat at a round table. The researcher led the discussion where every respondent had a chance to speak. The researcher had an assistant who helped in taking notes.

3.11 Pre-testing of Data Generation/Collection Tools

Pretesting is the stage in research when research tools are tested on target population members, to evaluate the reliability and validity of the survey instruments before their final distribution. The researcher conducted a pre-test of the data collection tools. This was done to 10 randomly selected journalists from Pamoja FM. Pamoja FM was selected because it has similar characteristics as Ruben FM, as they are both community radios and operate in Nairobi slums. Further, five were involved in the focus group discussion. The results helped give insight into understanding the questionnaire and the topic at hand. It was also relevant in testing the efficiency of the data collection tools.

3.12 Validity and Reliability of Research Tools

The validity of a research instrument assesses the extent to which it measures what it is designed to measure (Mohajan, 2017). The study employed content validity, face validity and construct validity. Content validity was tested using opinions from research experts such as the supervisors and university lecturers during proposal corrections to make suggestions for changes to the research tools' structure. In face validity, the questionnaire was subjected to expert analysis and opinions from at least two external experts who thoroughly checked the representativeness of the research instrument at face value and critically examine each question against study objectives. Construct validity was evaluated using factor analysis. If a questionnaire is a construct valid, all items together represent the underlying construct well.

Reliability refers to the extent that the instrument yields the same results over multiple trials (Mohajan, 2017). To test for the reliability of the research tools, the study used Cronbach's alpha, which measures the tool's internal consistency. Internal

consistency is typically measured based on the correlations between different items on the same test. The research tool was considered reliable if Cronbach's alpha for every variable or construct equals or exceeds 0.7. The Cronbach alpha (α) coefficient was computed as follows:

$$\alpha = \frac{k}{k-1} \times [1 - \frac{\sum (S^2)}{\sum S^2_{sum}}]$$

Where: A = Cronbach's alpha

k = Number of responses

$\sum (S^2)$ = Variance of individual items summed up

$\sum S^2_{sum}$ = Variance of summed-up scores

3.13 Data Analysis and Presentation Plan

The study generated both quantitative and qualitative data. This required both quantitative and qualitative analysis methods. Quantitative data was analysed using SPSS, where the questionnaires were checked for completeness before data coding and entry. After data entry, descriptive statistics, including frequencies, mean, and standard deviation were generated for quantitative data analysis. The findings were presented in tables and figures.

Moreover, qualitative data generated from open-ended questions in questionnaires and focus group discussions was analysed using content analysis. Content analysis entails thematically arranging the responses from open-ended questions and interviews and presenting them in descriptive narratives and direct quotations. The researcher was able to evaluate the existence, definitions, and connections of such specific words, themes, or ideas by using content analysis of the study (Taylor & Bonsall, 2017). This involved observing the similar answers and ideologies brought out by the respondents. This then helped in describing the answers

as given by the respondents. Finally, the findings were presented in the form of narratives and direct quotations.

3.14 Ethical Considerations

The researcher obtained a research permit from the Ethics Review Board and NACOSTI for approval and clearance to collect the needed data after getting an Introductory letter from Aga Khan University and an Approval letter from Aga Khan University Ethics Review Committee. Moreover, when conducting research, a researcher should consider ethical considerations. When gathering data for the study, several ethical issues were considered. The researcher did not reveal the participants' identities to third parties, ensuring their confidentiality. Furthermore, participants were not required to reveal their names to increase credibility. The research study also assured the participants that the work was strictly for academic purposes, and they were free to withdraw from the study at any time.

3.15 Summary

This section has extensively discussed the methodology of the study. The study used a cross-sectional design because it is a one-time study. Further, the target population was the management, senior staff, and the public relations department staff at Ruben FM. The study site was chosen because one of its main goals is to empower and educate the slum community at *Mukuru kwa Reuben* Nairobi, Kenya. The study used purposive sampling to pick the study site. The sample had 20 respondents where research questionnaires were administered, and focus group discussions were done. The researcher conducted a pilot test to verify the validity and reliability of data collection tools. The data were analysed using both quantitative and qualitative analysis methods.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND INTERPRETATION

4.1 Introduction

The study aimed to investigate technology uptake in Ruben FM radio station in Nairobi, Kenya. Specifically, the study sought to examine the extent of use of the existing digital technologies, explore other digital technology opportunities for uptake, and establish challenges facing digital technology uptake in Ruben FM radio station. This chapter presents the study's findings after collecting data from 20 respondents using questionnaires and focus group discussions among 10 respondents. The analysis, presentation, and interpretation of data were done in line with the research objectives and reported concurrently.

4.2 Presentation, Analysis, and Interpretation

4.2.1 Response Rate and Demographic Results

The study sought background information of the respondents, such as gender, highest academic qualifications, how long they worked at Ruben FM and their age bracket. The findings are shown in Table 1.

Table 1: Response Rate & Demographic Results

Gender	Frequency	Percent
Male	12	60
Female	8	40
Highest academic qualifications		
Certificate	3	15
Diploma	7	35
Degree	8	40
Postgraduate	2	10
Period working at Ruben FM		
Less than 1 years	2	10
1 to 2 years	5	25
3 to 4 years	6	30
Above 4 years	7	35
Age bracket		
18-29 years	5	25
30-39 years	10	50
40-50 years	4	20
More than 50 years	1	5

Regarding gender, the findings in Table 1 showed that most of the respondents were male, illustrated by 60%, and the rest were female, as illustrated by 40%. This implies that data on technology uptake in Ruben FM radio station was collected from all the respondents irrespective of gender.

Further on the highest academic qualifications, the findings in Table 1 showed that the highest academic qualification of the respondents was a degree as shown by 40%, was a diploma, as shown by 35%, was a certificate, as shown by 15% and was postgraduate as shown by 10%. This implies that most respondents learned enough to respond comprehensively to all questions regarding technology uptake in Ruben FM radio station.

Further, on period working at Ruben FM, the respondents indicated that they have been working at Ruben FM for more than 4 years, as shown by 35%, for 3 to 4 years as shown by 30%, for 1 to 2 years as shown by 25% and for less than 1 years as shown by 10%. This implies that most respondents had been working at Ruben FM for

long enough to provide credible information regarding technology uptake in the Ruben FM radio station.

Concerning the age bracket, the findings in Table 1 showed that the respondents were aged 30-39 years, as shown by 50%, 18-29 years, as shown by 25%, 40-50 years, as shown by 20% and more than 50 years as shown by 5%. In addition, the data collection cut across all the age groups and hence was credible enough as it was obtained from a wider scope regarding technology uptake in Ruben FM radio station.

4.2.2 Findings

The study collected data on the extent of use of the existing digital technologies, other digital technology opportunities for uptake and challenges facing digital technology uptake. The findings are presented in tables and narratives.

4.2.2.1 Research Objective One

The first objective sought to examine the extent of use of the existing digital technologies in the Ruben FM radio station. The respondents were asked to indicate some of the digital technologies Ruben FM has adopted since its establishment. The respondents indicated that the existing digital technologies at Ruben Fm were social media sites like Facebook, Twitter, Instagram and YouTube, a radio website and a podcast. The respondents were also asked to indicate the use of the above-mentioned digital technologies at Ruben FM. The respondents indicated that radio presenters depend heavily on social media for content generation and interactivity between themselves and their listeners. The respondents also indicated that Radio stations use digital technologies such as social media like Facebook to reach their perfect audience, build a community of engaged listeners, and connect with brands, musicians, and

collaborators (*Refer Figure 2*). The respondents also indicated that Ruben Fm Radio uses digital technologies to empower and unite the residents of the *Mukuru* community through education, information, and entertainment. The respondents further indicated that digital technologies like podcasts are used to raise awareness and engage the listeners on important community issues like women empowerment, health issues and community development (Example of podcast, Figure 3).

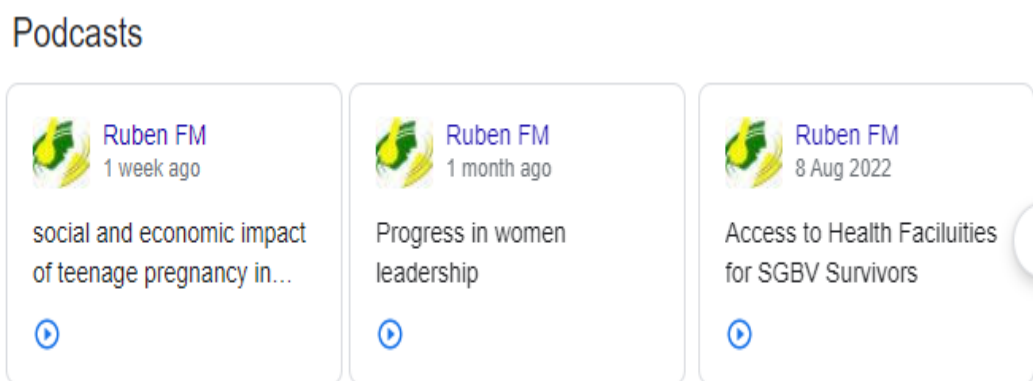
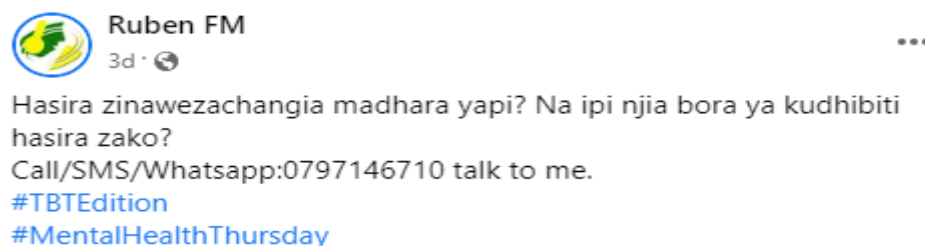
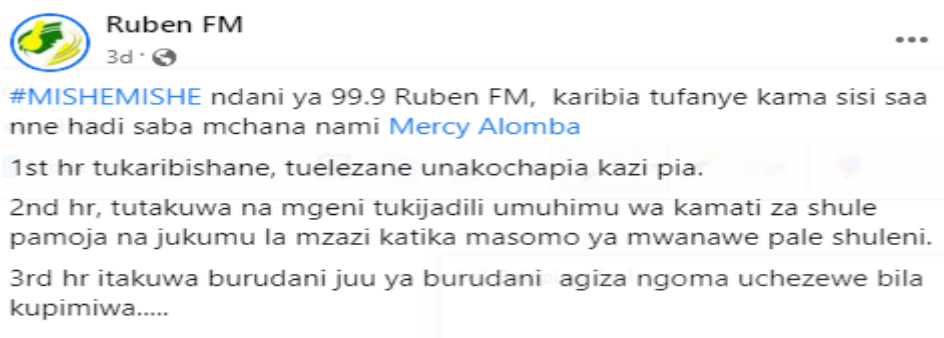


Figure 3: Ruben Fm Podcasts



Translation:

- Hasira Zinawezachangia Madhara yapi? Na ipi njia bora ya kudhibiti hasira zano (*What harm could anger lead to? Which is the best way to control your anger?*)



Translation:

Ndani ya 99.9 Ruben FM, Karibia tufanye Kama sisi saa nne hadi saba mchana nami Mercy Aloma {*Tuned in to 99.9 Ruben FM, welcome, lets act like us... from 10am to 1pm with me Mercy Aloma*}.

1st hr tukaribishane, tuelezane unakochapia kazi pia {*The first hour, we welcome each other, and we tell where we work*}.

2nd Hour, tutakuwa na mgeni tukijadili umuhimu wa Kamiti za shule Pamoja na jukumu la mzazi katika masomo ya mwanawe pale shuleni {*The 2nd hr, we will have a guest discussing the importance of school boards and the role of a parent on their children's education*}

3rd hr, itakuwa burudani juu ya burudani agiza ngoma uchezewe bila kupimiwa... {*3rd hour, it will be a music hour, request any song and will be granted without any limitations*}

Figure 4: Examples of Ruben Fm Facebook Posts

From the group discussions, the group members affirmed the above findings when asked to indicate which digital technologies Ruben FM has adopted since its establishment by asserting that the existing digital technologies include social media sites like Facebook, Twitter, Instagram and YouTube, radio website and a podcast.

The respondents were also asked to indicate how often they use the above mentioned digital technologies technologies at Ruben FM. The findings are illustrated in Table 2.

Table 2: Frequency of Using Digital Technologies at Ruben FM

	Frequency	Percent
Hourly	4	20
Daily	13	65
Weekly	3	15
Total	20	100

The respondents indicated that they use digital technologies at Ruben FM daily as shown by 65%, hourly by 20% and weekly by 15%. This implies that digital technologies at Ruben FM are used daily.

Further, the respondents were asked to indicate the extent to which Ruben FM radio station uses the following digital technologies using 1-4 Likert scale where 1 is not at all, 2 is the low extent, 3 is the moderate extent, and 4 is a great extent. The findings are shown in Table 3.

Table 3: The extent to which Ruben FM radio station uses various Digital Technologies

	Not at all	Low extent	Moderate extent	Great extent	Mean	Std. Dev.
Social media						
i. Facebook	0%	5%	20%	75%	3.700	0.571
ii. Twitter	0%	5%	30%	65%	3.600	0.598
iii. Instagram	10%	40%	45%	5%	2.450	0.759
iv. YouTube	0%	10%	35%	55%	3.450	0.686
Ruben FM website	0%	5%	40%	55%	3.500	0.607
Mobile applications	65%	30%	5%	0%	1.400	0.598
Podcast	0%	55%	45%	0%	2.450	0.510

From the findings in Table 3, most respondents indicated that Ruben FM radio station uses Facebook to a great extent, as shown by 75%, Twitter to a great extent, as shown by 65%, and YouTube to a great extent, as shown by 55%. The respondents also indicated that Ruben FM radio station uses Instagram to a moderate extent, as shown by 45%. Further, the respondents indicated that Ruben FM radio station uses the Ruben FM website to a great extent, as shown by 55% and Podcast to a low extent, as shown by 55%. However, the respondents indicated that Ruben FM radio station does not use Mobile applications at all, as shown by 65%.

The respondents were also asked to indicate which social media sites they use most, including Facebook and YouTube. The respondents were also asked to indicate how often they update their social media handles. The findings are shown in Table 4.

Table 4: Frequency of Updating the Social Media Handles

	Frequency	Percent
Not at all	1	5
Often	4	20
Very often	15	75
Total	20	100

From the findings, the respondents indicated that they update their social media handles very often, as shown by 75%, often as shown by 20% and not at all, as shown by 5%. Therefore, this implies that often Ruben FM updates their social media handles.

The respondents were further asked to indicate whether they get a lot of engagement and listener feedback while using digital technologies. The findings are shown in Table 5.

Table 5: Engagement and Listeners' Feedback while using Digital Technologies

	Frequency	Percent
Yes	17	85
No	3	15
Total	20	100

From the findings in Table 5, the respondents indicated that they get a lot of engagement and listeners feedback while using digital technologies, as shown by 85%, and others said no as shown by 15%. This implies that Ruben FM radio station gets a lot of engagement and listeners' feedback while using digital technologies. Furthermore, the respondents indicated that feedback has helped streamline the operations of Ruben FM radio station through suggestions and constructive critics from the listeners.

From the focus group discussions, the group members indicated that Ruben FM has adopted technology in its transmission by holding live events on social media sites, especially Facebook, to engage the community in important issues affecting the Mukuru community. These issues include fighting crime within Mukuru slums, ways

to empower women and youths, mental health, and community development in general. All the group members affirmed that they use social media for live streaming, constructive debates and discussions with listeners, and news delivery. The group members also said that technology helped the radio positively by facilitating the improvement of the programs aired by the radio as they can get suggestions from the listeners. The group members also said that through digital technologies like websites and other electronic media, they could gather more needed information and feed their audiences with current news and information. In support, one of the members said:

Digital technologies have helped radio positively as it has enabled the radio to reach their perfect audience with ease and has increased audience participation in radio programs as they can give their feedback through the social media comment section and has enabled. Digital technologies are also a cost-effective way to reach more people (FGD Group member 3).

Another group member in FGDs said:

Technology has helped me because it is the easiest way to reach out to people through social media platforms as Facebook live, WhatsApp, Twitter and Instagram, and you can have many discussions with young people (FGD Group member 5).

Another group member in FGDs noted that using digital technology was the best thing that had happened to them because, as a community radio station, the Communications Authority of Kenya had given them a limitation in terms of the radius that they can reach on the frequency but now “with the internet comes Facebook and we can broadcast to a broader audience across the whole world. We are no longer limited geographically; we can beat that limitation. That means someone in Doha, in the UK, and in the US, so long as they have access to the internet, so long as they can get time, they can now watch our shows worldwide. So we get people who send us feedback from across the world.

4.2.2.2 Research Objective Two

The study further explored other digital technology opportunities for uptake in Ruben FM radio stations. The respondents were asked to indicate the existing gaps in the uptake of digital technologies at Ruben FM. The respondents indicated that the existing gaps include failure to update the social media sites, especially sites regularly, inadequate engagement with the listeners given that in Mukuru slums, there is low internet connectivity and limited participation of the listeners in live streaming events organized. Other gaps identified included limited use of digital technologies like social media sites, the Ruben FM website and podcasts to regularly broadcast news and failure to have a Ruben FM mobile application.

The respondents were also asked to indicate the other existing digital technologies that Ruben FM radio station can adopt, and they indicated mobile applications, radio blogs, Tiktok and WhatsApp. The respondents were also asked to indicate the technological opportunities they are looking to adopt, and they indicated that they are looking for ways to create an offline radio mobile app that will enable more people with android phones to access radio programs without use of the internet. This will ensure perfect reach to the audience, especially youths with android phones. The respondents also indicated that digital technologies offer numerous opportunities for newsrooms, from how news is produced, broadcasted, and received by audiences. The respondents also indicated that digital technologies like Facebook had provided communities new opportunities to share news and information about their local communities.

In the focus group discussions, the group members were asked to indicate the digital opportunities they are looking to tap in digital technologies. The group members

indicated mobile applications, radio blogs, Tiktok and WhatsApp. One of the group members in FGDs said:

As you know community radio stations are given a small frequency, and we are not even able to; community radio stations are given a small frequency and we cannot even cover the small frequency. Since we have computers, we are looking to install software like VMIX that can stream beyond our frequency so that people can listen to us without any hustle. We will use VMIX to stream to Facebook. We also should use an App called Radio Garden, and the users of this app can gain access to us wherever they are in the world (FGD Group member 1).

Another group member in FGDs said:

First, radio is a technology because we can transmit on a frequency 99.9, but over and above that, we can beat geographical limitations. We can connect to the rest of the world via Facebook. I also do posters on Instagram to reach people and on Twitter, but our audience prefers Facebook, where we usually connect with a bigger audience who are usually not on the station's frequency" (FGD Group member 8).

From focus group discussions, the group members indicated that the digital advancements they have adopted internally include ensuring most programs are broadcasted on Facebook and adequate digital equipment to facilitate uptake of digital technologies. Further, the group members in FGDs indicated that there are digital managers and they believed that hiring digitally savvy individuals will give you a high engagement with their audience. The group members in FGDs also indicated that what they are doing to ensure that the radio is efficient in adopting digital technology includes ensuring adequate access to the internet and uninterrupted electricity by installing a backup generator and pushing for more audience. In support, one of the group members in FGDs said:

We keep pushing the agenda or the idea of Facebook and people watching us live. So, people aspire to go to the internet and Facebook especially, and I believe that whoever can access the internet is doing that right now. Nowadays, we've got even cheaper bundles and easier internet access. So, we can reach out to those whom we thought we would not have reached due to our limited frequency reach" (FGD Group member 3).

4.2.2.3 Research Objective Three

The study also sought to establish challenges facing digital technology uptake in Ruben FM radio stations. The respondents further asked the respondents to the challenges that Ruben FM station has faced in the uptake of technology at radio stations. The findings are shown in Table 6.

Table 6: Challenges that Ruben FM Station have faced in Uptake of Technology

	Yes		No	
	f	%	f	%
Power supply interruptions	18	90	2	10
Limited access to internet	15	75	5	25
Limited staff expertise in use of the new technology	16	80	4	20
Inadequate staff to manage the online digital platforms	15	75	5	25
Shortages in digital technology equipment	15	75	5	25
Stiff competition from other radio station's streaming services	3	15	17	85
Inability to get online audience	13	65	7	35

From the findings in table 6, the respondents indicated that challenges that Ruben FM station has faced in the uptake of technology at radio stations include power supply interruptions as shown by 90%, limited access to the internet as shown by 75% and limited staff expertise in the use of the new technology as shown by 80%. Other identified challenges included inadequate staff to manage the online digital platforms as shown by 75%, shortages in digital technology equipment, as shown by 75% and inability to get the online audience, as shown by 65%. Other challenges identified included unhealthy competition between radio presenters. However, the respondents indicated that stiff competition from other radio station's streaming services was not a challenge, as shown by 85%.

The respondents were also asked to indicate what can be done to address the challenges faced while adopting digital technologies at Ruben FM. They indicated

installing a backup generator for solving power supply interruptions, ensuring adequate internet access by procuring cheap and reliable internet from service providers, and mobilizing financial resources for employing staff with expertise in the new technology and management of the online digital platforms. The respondents also indicated that it had been a challenge to manage the online digital platforms.

From focus group discussions, the group members indicated that the challenges they face as they adopt digital technologies include power supply interruptions, inadequate staff with expertise in the new technology and inadequate staff to manage the online digital platforms regularly. Other challenges identified included unhealthy competition from other radios' streaming services and the inability to get an online audience because of the high cost of accessing the internet. In support, one group member in FGD said:

Since most of the shows were on Facebook Live, access to the shows was expensive for listeners. Hence they could not be online for long periods. Therefore, most listeners can only tune in for a specific show or shows to control the cost of data bundles (FGD Group member 10).

4.3 Summary of Key Findings

The research has established that there has been an uptake of technology in Ruben FM radio station. The three research questions that guided the study have generated data as envisioned. The research questions touched on the extent to which Ruben FM has taken up digital technology in its operation, other digital technology opportunities should Ruben FM radio station adopt, and the challenges facing digital technology uptake by Ruben FM radio station.

The first research question was on the extent to which Ruben FM has taken up digital technology in its operation. The study established that the existing digital technologies used daily at Ruben FM were social media sites like Facebook, twitter,

Instagram and YouTube, radio website and a podcast. The study found that radio presenters heavily depend on social media for content generation and interactivity amongst themselves and their listeners. The study also found that Radio stations use digital technologies such as social media like Facebook to reach their perfect audience, build a community of engaged listeners, and connect with brands, musicians, and collaborators. Ruben FM Radio uses digital technologies to empower and unite the residents of the *Mukuru* community through education, information, and entertainment. The study also found that digital technologies like podcasts are used to raise awareness and engage the listeners on important community issues as women empowerment, health issues and community development. The study also established that Ruben FM radio station get a lot of engagement and listeners feedback while using digital technologies and that the feedback has helped streamline the operations of Ruben FM radio station through suggestions and constructive critics from the listeners. Digital technologies have helped radio positively as it has enabled the radio to reach their perfect audience with ease and has increased audience involvement in radio programs as they can give their feedback through social media comment section and has enabled.

The second research question was on which other digital technology opportunities Ruben FM radio station should adopt. The study established that the existing gaps include failure to update the social media sites, especially sites regularly, inadequate engagement with the listeners given that in Mukuru slums, there is low internet connectivity and limited participation of the listeners in live streaming events. Other gaps identified included limited use of digital technologies like social media sites, the Ruben FM website and podcasts to regularly broadcast news and failure to have a Ruben FM mobile application. The study also found the other existing digital technologies that Ruben FM radio station can adopt indicated mobile applications, radio

blogs, Tiktok and WhatsApp. The study revealed that technological opportunities that Ruben FM should adopt include looking for ways to create an offline radio mobile app that will enable more people with android phones to access radio programs without the use of the internet. The study also found that the digital advancements they have adopted internally include ensuring most programs are broadcasted in Facebook and ensuring adequate digital equipment to facilitate uptake of digital technologies. In addition, to ensure that the radio is efficient in adopting digital technology, including providing adequate internet access, and uninterrupted electricity by installing a backup generator and pushing for more audience.

The third research question was on the challenges facing digital technology uptake by Ruben FM radio station. The study found that challenges that Ruben FM station has faced in the uptake of technology at radio stations include power supply interruptions, limited internet access and staff expertise in the use of the new technology. Other identified challenges included inadequate staff to manage the online digital platforms, shortages in digital technology equipment, inability to get an online audience and unhealthy competition between radio presenters. To address these challenges, the study established that there is a need for installing a backup generator to solve power supply interruptions, ensuring adequate internet access by procuring cheap and reliable internet from service providers, mobilizing financial resources for employing staff with expertise in the use of the new technology and management of the online digital platforms.

4.4 Summary

This chapter has presented the findings of the study. The study established that the existing digital technologies used daily at Ruben FM were social media sites like Facebook, Twitter, Instagram and YouTube, a radio website and a podcast. The study found that radio presenters heavily depend on social media for content generation and interactivity amongst themselves and their listeners. Radio stations use digital technologies such as social media like Facebook to reach their perfect audience, build a community of engaged listeners, and connect with brands, musicians, and other collaborators. The next chapter discussed the findings concerning the research questions, literature review and theoretical framework, and offer a conclusion and recommendations.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the study's major findings, interpreting them in relation to the objectives that sought to investigate technology uptake in Ruben FM radio station in Nairobi, Kenya. The specific objectives were to examine the extent of use of the existing digital technologies in Ruben FM radio station, explore other digital technology opportunities for uptake in Ruben FM radio station and establish challenges facing digital technology uptake in Ruben FM radio station. Finally, this chapter provides conclusions and recommendations arising from the findings and areas for further research.

5.2 Discussion of Key Findings

5.2.1 Extent to which Ruben FM has taken up Digital Technologies

The study found that the digital technologies currently being used daily at Ruben FM include social media sites like Facebook, Twitter, Instagram and YouTube, a radio website and a podcast. The study found that radio presenters heavily depend on social media for content generation and interactivity amongst themselves and their listeners. The study also found that Radio stations use digital technologies such as social media like Facebook to reach their perfect audience, build a community of engaged listeners, and connect with brands, musicians, and collaborators. Ruben FM Radio uses digital technologies to empower and unite the residents of the Mukuru community through education, information, and entertainment. The study also found that digital technologies like podcasts are used to raise awareness and engage the listeners on important community issues like women empowerment, health issues and community

development. The findings are in line with Delfanti and Arvidsson (2019), who claim that the uptake of digital technology has led to the emergence of digital media. Media is a technique for transmitting the information. Digital media is information consumed or encrypted using a computer forum, electronic gadget, or screen. The findings are in line with Stewart, Spurgeon, and Edwards (2019) argue that community radio stations are continually adjusting to technological challenges, such as going from simple to advance. Numerous are also using the Web to extend their scope and reach.

The study also established that Ruben FM radio station gets a lot of engagement and listeners feedback while using digital technologies and that the feedback has helped streamline the operations of Ruben FM radio station through suggestions and constructive critics from the listeners. Digital technologies have helped radio positively as it has enabled the radio to reach its perfect audience with ease and has increased the participation of the audience in radio programs as they can give their feedback through the social media comment section and has enabled. Hlatshwayo (2017) argue that radio stations embrace better data gathering, production, dissemination, and income era approaches. This can be seen in their developing utilisation of social media stages like Facebook, YouTube, Instagram, and Twitter, among others, as stages of reaching out to audiences. Stewart, Spurgeon, and Edwards (2019) noted that media houses that run radio stations had shaped advanced divisions entrusted with working their websites and social media handles. The widespread use of social media has increased online movement by media organizations, resulting in the adoption of previously unutilized strategies for grouping, planning, and disseminating news worldwide.

5.2.2 Other Digital Technology Opportunities that Ruben FM radio Station Adopt.

The study established that several technological uptake gaps included failure to update the social media sites regularly and inadequate engagement with the listeners, given that in Mukuru slums, there is low internet connectivity and limited participation of the listeners in live streaming events organized. Other gaps identified include limited use of digital technologies like social media sites, the Ruben FM website and podcasts to regularly broadcast news and failure to have a Ruben FM mobile application. The study also found the other existing digital technologies that Ruben FM radio station can adopt indicated mobile applications, radio blogs, Tiktok and WhatsApp. The findings agree with Mabweazara (2014), who notes that the use of digital technologies in the traditional practice of journalism offers numerous opportunities for newsrooms from how news is produced, broadcasted, and received by audiences. The findings also agree with Lewis and Molyneux (2018), who argues that technology offers media houses analytical tools such as Chartbeat, Orphan and Lantern to gauge audience behaviour with content. The findings also concur with Leijendekker and Mutsvairo (2014), who asserts that community radios can increase the democracy space in their jurisdictions by providing online spaces for discussions. The use of social media, particularly, has broadened the democratic space in African countries by allowing more people with different views to participate in news gathering and dissemination. The findings agree with Technology Acceptance Model that notes that radio stations to adopt digital technology, they must look at its usefulness, available opportunities for its uptake and any existing challenges that may affect the uptake of digital technology.

The study revealed that technological opportunities that Ruben FM should adopt include creating an offline radio mobile app that will enable more people with android phones to access radio programs without using the internet. The study also found that

the digital advancements they have adopted internally include ensuring most programs are broadcasted in Facebook and ensuring adequate digital equipment to facilitate uptake of digital technologies. To ensure that the radio is efficient in adopting digital technology, ensure adequate internet access, and uninterrupted electricity by installing a backup generator and pushing for more audience. The findings agree with Mare (2013), who argues that internet provides media houses with access to gigantic new audiences. Newsrooms can grow and retain audiences willing to consume content online through their websites and social media sites. Media audiences have now become influential players in media content. They must be contacted, heard, and allowed to partake in the news-making procedure. The findings concur with Mwangi (2021), who asserts that social media presents traditional newsrooms with extended newsgathering capabilities, leads on stories, and redirects back to websites or broadcasts through social media, and community radio journalists can widen the impact of their journalism by providing platforms for crowdsourcing and sharing their reporting.

5.2.3 Challenges facing Digital Technology Uptake by Ruben FM Radio Station

There are various challenges that Ruben FM station faces in the uptake of technology at radio stations, including power supply interruptions, limited access to the internet and limited staff expertise in the use of the new technology. The findings agree with (Nassanga et al., 2013) who found that a few of the challenges that rural community radio stations confront in take-up of innovation incorporate high expenses charged by benefit suppliers, high cost of gear, tall operational and support costs, and the need for normal control supply. In addition, the findings concur with (Bor, 2014), who noted that few establishment media benefit from their online media operations due to competition for focus and advertising, as well as the few people pay for online news.

Other identified challenges included inadequate staff to manage the online digital platforms, shortages in digital technology equipment, inability to get the online audience and unhealthy competition between radio presenters. To address these challenges, there is a need for installing a backup generator for solving power supply interruptions, ensuring adequate internet access by procuring cheap and reliable internet from service providers, mobilizing financial resources for employing staff with expertise in the use of the new technology and management of the online digital platforms. The findings agree with Shitemi (2021), who argues that although digital technologies have unlocked new platforms for news production and distribution, numerous challenges are still associated with its use. Most communal radios are situated in rural or urban slum areas. It poses a challenge to the issue of the digital divide. Despite the need to adopt digital technology, the community radios have a considerable gap with some of their audience not digitally literate. The findings concur with Rahman (2016), who note that the uptake of digital technology by community radio stations is greatly inhibited by lack of the electricity or regular power supply, the high fees charged by the service providers (internet and telephone), as well as the high cost for the ICT equipment, maintenance expenses and operational costs.

5.3 Conclusion and Implications for Practice

The study concluded that existing digital technologies are used daily to a greater extent at Ruben FM, including social media sites like Facebook, Twitter, Instagram and YouTube, a radio website and a podcast. It was established that radio presenters heavily depend on social media for content generation and interactivity amongst themselves and their listeners. Ruben FM Radio uses digital technologies to empower and unite the residents of the Mukuru community through education, information, and entertainment. Digital technologies like podcasts are used to raise awareness and engage the listeners

on important community issues like women's empowerment, health issues and community development. As a result, Ruben FM radio station gets a lot of engagement and listeners feedback that has helped streamline the operations of Ruben FM radio station.

The study concluded that there are other digital technology opportunities that Ruben FM radio station should adopt. These were identified by highlighting the existing gaps in the uptake of digital technologies, including failure to update the social media sites, especially sites regularly, inadequate engagement with the listeners given that in Mukuru slums, there is low internet connectivity and limited participation of the listeners in live streaming events organized. It was established that other technologies that Ruben FM should adopt included mobile applications, radio blogs, Tiktok and WhatsApp. It was also clear that digital advancements that Ruben FM have adopted internally include ensuring most programs are published in Facebook and ensuring adequate digital equipment to facilitate the uptake of digital technologies.

The study further concluded that there are various challenges facing digital technology uptake by Ruben FM radio station. These include power supply interruptions, limited access to the internet, limited staff expertise in the use of the new technology, inadequate staff to manage the online digital platforms, shortages in digital technology equipment, inability to get the online audience and unhealthy competition between radio presenters.

5.4 Recommendations

The study recommended that the Management of Ruben FM radio station should ensure the installation of a backup generator to solve power supply interruptions.

There is also a need for mobilizing financial resources to hire staff with expertise in the new technology and management of online digital platforms.

The study also recommends that the management of Ruben FM radio station should create an offline radio mobile app that will enable more people with android phones to access radio programs without using the internet. This would ensure perfect reach to the audience, especially youths with android phones.

The study also recommends that community radio like Ruben FM take advantage of the upcoming digital technologies like Tiktok, Whatsapp, mobile apps and VMIX software. This would enable the radio stations to effectively create content that will appeal to the targeted audience and address the geographical limitation set by the CA.

The study also recommends that the Ruben FM radio station management continue advocating for interaction between the audience and radio presenters in digital technologies and seek listener feedback. This would help streamline the operations of Ruben FM radio station through suggestions and constructive critics from the listeners.

The research recommends that the relevant government ministry assists in reducing unhealthy competition among the media houses. This step will protect the upcoming FM radio stations in the industry. The researcher also recommends that the government and the other stakeholders that determine the economic status of the country make sure that its stable since it highly affects the choice of innovation strategy.

5.5 Areas for Further Research

This study only focused on Ruben FM. Hence, the study should be replicated in other community radio like Koch FM, KU FM, Ghetto FM and PAMOJA FM and

investigate the uptake of digital technology. Moreover, the same study should focus on commercial radio stations in Kenya like Radio Citizen, Radio Jambo, and Radio Maisha, among others.

Future studies need to establish the factors affecting the uptake of digital technologies among radio stations in Kenya. Future researchers also need to conduct a comparative study between community and commercial radio stations and establish the difference between them in terms of uptake of digital technologies.

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APPENDICES

Appendix A: Focus Group Discussion

1. Which digital technologies has Ruben FM adopted since establishment?
2. How has Ruben FM been able to adopt technology in its transmission?
3. Do you use social media?
4. How has technology helped the radio positively?
5. What are the digital opportunities that you are looking to tap in terms of digital technologies?
6. What digital advancements have you adopted internally?
7. Do you have digital managers?
8. What are you doing to ensure that the radio is efficient in the adoption of digital technology?
9. Do you think hiring digital savvy individuals will give you a high engagement with your audience?
10. What challenges do you face as you adopt digital technologies?
11. What can be done to address the challenges faced while adopting digital technologies at Ruben FM?

Appendix B: Questionnaire

This questionnaire is to collect data for purely academic purposes. All information will be treated with strict confidentiality. Do not put any name or identification on this questionnaire. Answer all questions as indicated by either filling in the blank or ticking the option that applies.

Section A: Background Information

1) Please indicate your gender:

Male

Female

2) Please indicate your highest academic qualifications

Certificate

Diploma

Degree

Postgraduate

3) For how long have you been working at Ruben FM?

Less than 1 years

1 to 2 years

3 to 4 years

Above 4 years

4) What is your age bracket?

18-29 years

30-39 years

40-50 years

More than 50 years

Section B: Extent of Uptake of Digital Technology

5) Please indicate some of digital technologies that Ruben FM have adopted since establishment

Please indicate in detail the use of above-mentioned digital technologies at Ruben FM

6) How often do you use above-mentioned digital technologies at Ruben FM?

Hourly

Daily

Weekly

Monthly

7) Please indicate to what extent does Ruben FM radio station use the following digital technologies using 1-4 Likert scale

		Not all	Low extent	Moderate extent	Great extent
Social media	Facebook	[]	[]	[]	[]
	Twitter	[]	[]	[]	[]
	Instagram	[]	[]	[]	[]
	YouTube	[]	[]	[]	[]
Ruben FM website		[]	[]	[]	[]
Mobile applications		[]	[]	[]	[]
Podcast		[]	[]	[]	[]

8) Which social media sites do you use mostly?

9) How often do you update your social media handles?

Not at all Often Very often

10) Do you get a lot of engagement and listeners feedback while using digital technologies?

Yes

No

If yes, how has the feedback helped streamline the operations in Ruben FM radio station?

Section C: Opportunities in the digital space

11) What are the existing gaps in uptake of digital technologies at Ruben FM?

12) What other existing digital technologies that Ruben FM radio station can adopt?

13) Which technological opportunities are you looking to adopt and why?

14) What do you think the radio can do to tap to use the digital technologies that are yet to be adopted?

Section D: Challenges faced in the Uptake of Digital Technology

15) The following are some of challenges that may be faced in uptake of technology at radio stations. Please indicate the ones that are applicable to case of Ruben FM station.

Challenge	Yes	No
Power supply interruptions
Limited access to internet
Limited staff expertise in use of the new technology
Inadequate staff to manage the online digital platforms
Shortages in digital technology equipment
Stiff competition from other radio station's streaming services
Inability to get online audience

16) What other challenges do you face as you adopt digital technologies?

17) What can be done to address the challenges faced while adopting digital technologies at Ruben FM?

18) Do you find it hard to manage the online digital platforms?

Thank you for your Participation

Appendix C: AKU Ethics Review Committee Approval Letter



THE AGA KHAN UNIVERSITY
Graduate School of Media and Communications

REF: AKU-GSMC/ERC/2022/002

Date: September 05, 2022.

Dear Shisia Wasilwa (Student No. 553315)

**RE: A STUDY TO INVESTIGATE UPTAKE OF DIGITAL TECHNOLOGY IN RUBEN
FM RADIO STATION**

This is to inform you that Aga Khan University - Graduate School of Media and Communications Ethics Review Committee has reviewed and approved your above research proposal. Your approval period is September 05, 2022, to September 04, 2023, and your application's approval number is AKU-GSMC/ERC/2022/002.

This approval is subject to compliance with the following, under the supervision of your two supervisors:

1. Only the approved documents including the informed consent form and the data collection instruments will be used.
2. Any changes, made on the approved documents that may increase the risks or affect the welfare or safety of the participants or compromise the integrity of the study must be reported to GSMC within the shortest time possible. The amended documents will be taken through a fresh review and the due process of approval.
3. In the event that the research cannot be completed within the one-year approved period, the researcher will request for renewal of approval 30 days prior to the end of the approved period.
4. The researcher will be required to submit a comprehensive progress report when applying for renewal of approval.
5. Submission of an executive summary report to the GSMC's Ethics Review Committee within 90 days of completion of the study.
6. Produce all the data collected using the approved tools as and when required by the Ethics Review Committee within the 90 days of completion of your study.

Prior to commencing your study, you will be required to obtain a research permit from National Commission for Science, Technology, and Innovation (NACOSTI). You can access the application portal from the website on <https://www.nacosti.go.ke/>.

Please feel free to contact me should you require any further information.

Yours sincerely

Dr Nancy Booker
Interim Dean

University Centre, 4th Floor, 3rd Parklands Avenue
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Tel: +254 20 3740062/63, +254 (0) 731 888 055; +254 (0) 719 231 530
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Appendix D: Introductory Letter from AKU



THE AGA KHAN UNIVERSITY
Graduate School of Media and Communications

National Commission for Science, Technology, and Innovation
P. O. Box 30623 – 00100
Nairobi

September 05, 2022

Dear Sir/Madam,

SHISIA WASILWA (STUDENT NO. 553315)

Shisia Wasilwa is a registered student at the Aga Khan University, Graduate School of Media and Communications. He is enrolled in the Master of Arts in Digital Journalism Programme and has completed his course work. He is now working on his Master's thesis. Mr. Dennis' topic is "A Study to Investigate Uptake of Digital Technology in Ruben FM Radio Station."

The purpose of my writing is to request you to assist Mr. Wasilwa complete this important academic exercise. Any information collected will be used solely for academic purposes. Upon completion of the research, Mr. Wasilwa's thesis will be available at our library. He will also submit two hard copies and one soft copy in pdf of his completed work to your department.


We appreciate your support to our student towards his successful completion of his thesis research.


Please feel free to contact me should you require any further information.

Yours sincerely,

Prof. Nancy Booker
Interim Dean


Appendix E: NACOSTI Research Licence


REPUBLIC OF KENYA
National Commission for Science, Technology and Innovation


**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY & INNOVATION**

Ref No: **648538** Date of Issue: **03/November/2022**


RESEARCH LICENSE




This is to Certify that Mr.. Nahashon Shisia Wasilwa of Aga Khan University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: A study to investigate uptake of digital technology in Ruben FM Radio station for the period ending : 03/November/2023.

License No: **NACOSTI/P/22/21359**

648538
Applicant Identification Number


Director General
**NATIONAL COMMISSION FOR
SCIENCE, TECHNOLOGY &
INNOVATION**

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See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
 - i. Endanger national security
 - ii. Adversely affect the lives of Kenyans
 - iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
 - iv. Result in exploitation of intellectual property rights of communities in Kenya
 - v. Adversely affect the environment
 - vi. Adversely affect the rights of communities
 - vii. Endanger public safety and national cohesion
 - viii. Plagiarize someone else's work
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13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
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