AN EVALUATION OF 5G WIRELESS NETWORK DEPLOYMENT IN TELECOMMUNICATION FIRMS: A CASE OF SAFARICOM

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OCTOBER, 2025

DECLARATION

DECLARATION

This research project is my original work and has not been presented for the award of a degree or any similar purpose in any other institution.

Signature _____ Date 31/10/2025

KIRURI EMMANUEL

ICT-G-4-1091-20

Supervisor: This research project has been submitted with my approval as University Supervisor

Signature _____ Date 31/10/2025.

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ABBREVIATIONS AND ACRONYMS

Acronym	Definition
1G	First Generation
2G	Second Generation
3G	Third Generation
4G	Fourth Generation
4G LTE-A	Fourth Generation Long Term Evolution
5G	Fifth Generation
CDMA	Code Division Multiple Access
FCC	Federal Communications Commission
FDMA	Frequency Division Multiple Access
GHz	Gigahertz
ICT	Information and Communication Technology
ID	Identity
IoT	Internet of Things
IT	Information Technology
LTE	Long Term Evolution
MIMO	Multiple-Input/Multiple-Output
NFV	Network Function Virtualization
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal Frequency Division Multiple Access
SASE	Secure Access Service Edge

Acronym	Definition
SDR	Software-Defined Radio
TD-	Time Division Synchronous Code Division Multiple Access
TDMA	Time Division Multiple Access
UMTS	Universal Mobile Telecommunication System

ABSTRACT

Modern technology has become an indispensable aspect of most enterprises globally. For the past few decades, telecommunication firms, fintech companies, and other industries have relied heavily on advanced technology. Fast internet speed is the need of the hour, and every major telecommunication company is pushing to make it even faster. To keep up with the constantly changing world, we require more and more technology. The fifth-generation (5G) wireless technology has arrived, with the primary aim of increasing capacity, higher data throughput, lower latency, and quality service. Many studies have been conducted on the adoption and implementation of 5G wireless technology in different industries. For instance, researchers have explored the factors that affect adopting 5G technology in healthcare, agriculture, and other sectors. Few studies have examined Kenyan telecom firms' 5G wireless adoption. Telecommunication businesses in Kenya have yet to fully implement 5G wireless technology, thus variables that may affect its adoption must be examined. To leverage 5G's benefits, you must understand its problems and opportunities. This study examines Kenyan telecommunication firms' wireless technology adoption variables to close this gap. This study examines individual traits, technological and organizational factors, and cybersecurity issues that may affect Kenyan telecommunication companies' 5G wireless network adoption. Telecommunications companies select middle- to senior-management employees using stratified sampling. Questionnaires, descriptive statistics, Pearson correlation, and multiple regression analysis were used. The results showed that age, education, and experience favorably affect 5G wireless technology adoption. Perceived utility and ease of usage strongly influence 5G adoption. Top management support, culture, and training boost 5G adoption. Finally, cybersecurity worries hinder 5G adoption. Thus, Kenyan telecommunication companies should link developing technology with sufficient infrastructure to enable its adoption and educate and train their staff on the value of new technology to stay competitive in the dynamic and competitive market.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

In today's business environment, the breadth and use of computers and information technology have grown dramatically. Since the 1980s, information technology has received more than half of all new capital investments. Because of the rapid integration of technology into practically every element of civilization, the atmosphere has been marked by constant unpredictability and turmoil. Technology has altered human perceptions of social connection, health, economics, manufacturing, production, and even service delivery (Mao et al., 2020). Many organizations have resorted to innovation for long-term success as a result of this realization. The penetration of technology has allowed people from all over the world to collaborate and improve on existing technology, as well as come up with innovative ideas that have continued to shape how humans interact.

Wireless networks have evolved from the first to the fifth generation (Uwaechia & Mahyuddin, 2020). The first-generation mobile wireless communication network, known as 1G, was launched in 1980 and was entirely analogue, supporting solely voice communications (Rida, 2021). With the second generation of mobile networks or 2G, the digital era of mobile communications began. There were two routes for the technological standards that allowed 2G: The first track included FDMA and TDMA technologies, while the second track employed CDMA technology.

Only when the invention is seen to be effectively integrated into the environment or organization, and the intended users adopt the innovation and demonstrate a long-term commitment to consuming the goods and services it delivers, can it be considered a success (Rubio-Andrés & Abril, 2023). While a firm can accept innovation, it is only effective if individuals do as well. This implies that once an invention has been integrated into various

organizational processes and procedures, its success is heavily reliant on whether employees see the innovation as beneficial and adopt it in their everyday lives.

The mobile communications business, such as Safaricom, has seen substantial technical growth. The successful creation of the fifth cellular technology generation, commonly known as a 5G or 5G network, has placed the mobile communication industry on the verge of what can only be regarded as a significant milestone in the technological revolution (Mladen Božanić and Sinha, 2021). According to Navarro-Ortiz et al. (2020) when compared to earlier cellular technologies, 5G is intended to provide a broader range of services, customers, and traffic levels.

The 3G mobile technology brought increased capacity, quicker data transfer rates, and multimedia capability. 3G was built on UMTS and CDMA technology. By merging 3G technology with a fixed technology that delivers high-speed wireless mobile internet, 4G solved the constraints of the previous generation Jiang and Han (2024). Furthermore, it accelerated bandwidth transfer and significantly reduced the cost of various resources.

LTE, a revolutionary mobile network technology, made 4G possible. Some of the technologies that have been integrated with the 4G communication standard include SDR receivers, OFDM, OFDMA, MIMO technologies, UMTS, and TD-SCDMA (Okoro, 2021).5G refers to the fifth generation of mobile networks, which was brought about by growing bandwidth needs. It is much more than simply fast mobile internet. The majority of its application cases are far in the future. 5G is extremely fast and can accommodate a huge number of devices, assisting in the digitization of many sectors (Narayanan et al., 2020). It can also function in a wide range of frequency bands, covering both high and low frequencies. According to Xu et al. (2020) the higher frequency bands for 5G have limited coverage but extremely low latency (less than 1 millisecond), making them ideal for real-time services

The 5G network, which may ensure that many economies are appropriately cared for in a "smart living" society, is the basis of technology's present and future. In addition to continuous mobile activity, it enables massive machine-to-machine connections, guaranteeing adequate service delivery and that industrial processes are properly kept. Given the impact of the 5G communication standard, a government or nation must accept it. The impact of 5G is expected to be seen in almost every part of everyday life, and if deployed, it is likely to be regarded as a critical national infrastructure. The United States has taken a step toward 5G spectrum certification by utilizing the FCC to add the 28 GHz, 37 GHz, and 39 GHz bands (Frieden, 2020). South Korea and China are two countries that have led the way in adopting this new technology. Countries in Europe such as the United Kingdom, France, Germany, Turkey, Estonia, and Sweden have played crucial roles in assuring the financial viability of the 5G network.

The high spectral efficiency is beneficial if the technology is fully implemented because it can handle more people at a lower cost. 5G networks are expected to deliver more advanced services, products, and functions at a lower cost and with greater efficiency. Recent developments in cloud computing, NFV, edge computing, and SDN are expected to help in the smooth integration and expansion of 5G technology (Garg et al., 2021). Massive amounts of data can be delivered in less time thanks to 5G technology. The 4G LTE-A network in Sub-Saharan Africa is still being tested. The transition from earlier mobile networks to 5G will be more gradual than sudden.

According to Citizen Tv, the Communications Authority of Kenya (2019) has awarded five firms licenses to conduct 5G trials in Kenya for one year. CA acting director-general Mercy Wanjau said mobile operator Safaricom and four other companies had been granted licenses. Wanjau went on to say that they are aware of the security risks posed by 5G technology and that the trial phase would be utilized to address these concerns.

1.2 Statement of the Problem

Modern technology and innovation have been linked to increased economic success and organizational effectiveness in a significant and positive way. The advantages of modern technology are largely responsible for improved economic performance and a positive impact on the economy and various organizations. One of the essential structures that the government should undertake and control is the adoption of modern technology (5G in this case). It is important, however, to note that the effect of these factors on the adoption of modern technology is still subject to context. This study focused on the factors that affect the adoption of modern technology, specifically 5G technology in Kenya, several factors were thoroughly investigated, including Infrastructure, government policy, capital, and adequate information communication are all important factors. knowledge and skills in ICT, as well as the impact of affordability on the implementation of Kenya's 5G communication standard. A study by Golightly et al. (2022) linked the low rate of adoption of modern technology and innovation to different characteristics. This study examined the factors that influence the adoption of modern technology in Kenya, particularly 5G technology. Infrastructure, government policy, capital, appropriate ICT knowledge and skills, and the financial impact on the adoption of the 5G communication standard in Kenya were all extensively investigated.

1.3 Purpose of the Study

The purpose of this research was to demonstrate how current technology can be adapted by the nation, how that was accomplished, and the benefits of adopting 5G network technology to the nation and its users. Moving to 5G as a nation would be also very beneficial and significant to many prime sectors in the nation.

1.4 Conceptual Framework

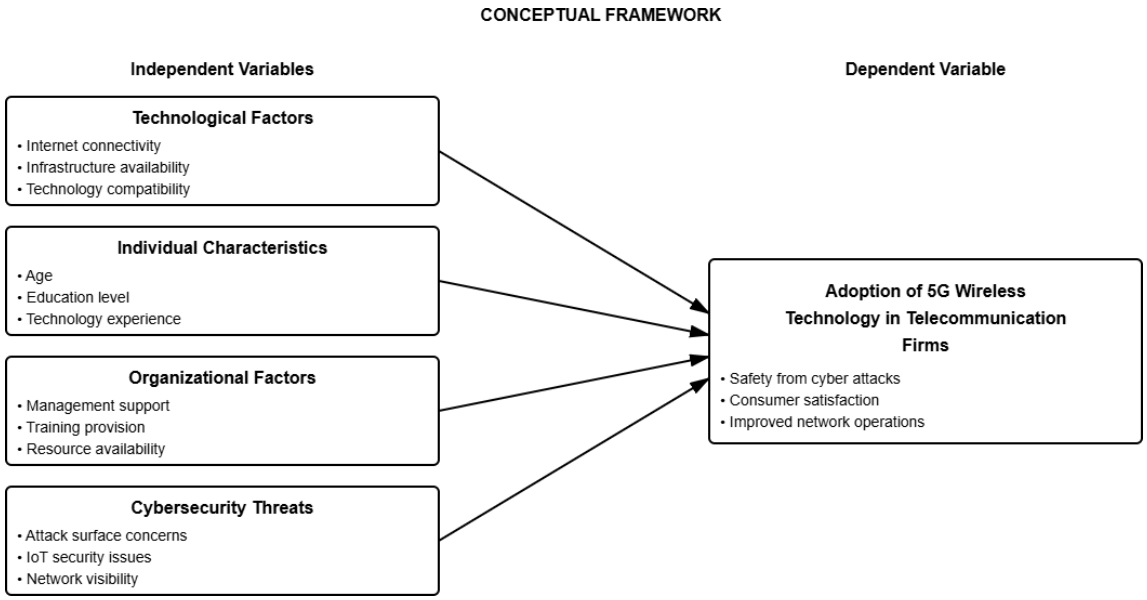

Figure 1: Conceptual Framework

1.5 Research Questions

i) Does the use of modern technology in Kenya depend on individual characteristics?

ii) Do technological factors influence 5G wireless technology adoption?

iii) Do organizational elements influence 5G wireless technology adoption?

iv) In what ways does cyber security affect the adoption of 5G wireless technology?

1.6 Objectives of the study

1.6.1 General Objective

To identify the variables influencing the deployment of 5G wireless technology in Kenyan telecommunications firms.

1.6.2 Specific Objectives

i) To analyze the individual characteristics affecting the adoption of modern technology in Kenya.

ii) To examine organizational factors affecting the adoption of modern technology in Kenya.

iii) To examine technological factors that affect the adoption of modern technology in Kenya.

iv) To analyze and examine cyber security threats that may lead to the rejection of 5G wireless network adoption in the country's telecommunications firms.

1.7 Hypothesis of the Study

H_0. Individual characteristics do not affect the adoption of modern technology in Kenya

H_1. Organizational factors do not affect the adoption of modern technology in Kenya

H_2. Technological factors do not affect the adoption of modern 5G networks in Kenya

H_3 There are no cyber security threats that affect the adoption of 5G technology in Kenya

1.8 Significance of the study

In the current business climate, modern technology has been strongly linked to the improved performance of both the economy of a country and the performance of different organizations. Thus, the findings of the study were significant to all the relevant stakeholders including the government, leaders of corporate organizations, especially the Information Communications companies within the country, individual users of the technology and academicians.

1.8.1 Governments and Corporate Organizations

The major responsibility of the government is to safeguard inhabitants' lives and property while also assuring their well-being and enjoyment. The research went into depth on the benefits of 5G technology. As a result, the findings of this study provided the Kenyan government and corporate organizations with useful information on the factors that influence the adoption of 5G technology in Kenya, as well as serve as a guideline for policy decisions, licensing, and managing the use of this technology.

1.8.2 Individual users

Consumers of this technology are also important considerations. This study is important for individuals because it gives knowledge of the elements that influence technological innovation adoption and guides their decision based on the advantages and demerits of the technology.

1.8.3 Academicians

This study gave academicians helpful information for future research. The findings served as a reference point for other researchers interested in understanding the elements that influence contemporary technology adoption in Kenya, as well as giving empirical data to back up the study.

1.8.4 Scope of the study

The research focused on technical enterprises that use contemporary technology in Kenya and have a head or regional office in Nairobi, specifically Safaricom. This was motivated by the fact that a lot of businesses are attempting to improve productivity by implementing current technology such as 5G. To do this, middle and senior managers were targeted to gather their feedback on the subject. Google Forms were created to simplify data gathering. Given the sensitivity of the information requested, respondents were assured of the strictest confidentiality and that the information gathered would be used solely for academic purposes. The necessary information was gathered between April and June 2025.

1.9 Limitations of the Study

(1) **Scope of discussions:** A student's lack of experience in writing scientific papers and completing complex projects.

(2) **Time constraints**: Because the study is reliant on communications facilities distributed throughout the country, the time to provide the research is restricted. Students must attend lectures, which limits their time to complete the research.

(3) **Limited access to data:** Telecommunications companies, such as Safaricom, provide limited information to secure their operations.

1.10 Assumptions

The study has several assumptions as follows:

(i) Current devices can be upgraded to 5G.

(ii) The assumption that the 5G network was driven by the needs of the Internet of Things

(iii) The 5G networks are for wave frequencies. This is a revolutionary technology providing access to massive bandwidth and capacity available above 24Ghz.

(iv) 5G is a major step in technology like move from 3G to 4G

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The literature review focuses on a variety of topics, such as the Individual factors that influence modern technology adoption, cyber security threats, and the organizational and technological factors that influence the 5G deployment.

2.2 Empirical Literature Review

2.2.1 Organizational Factors

Several organizational variables have a substantial impact on the adoption of new technology and innovation. As a result, firms must devise creative methods to explain to employees that every new concept or innovation that has to be adopted into the company should not be viewed as a danger, but rather as a necessary improvement that helped them do their jobs more efficiently (Faulks et al., 2021). Furthermore, firms must give more enabling circumstances to employees to aid them in learning how to utilize new technology and also to encourage them to warm up to the new concept or technology. Training and development, management assistance, and the use of incentives are among these elements.

2.2.2 Individual Characteristics

Different qualities that can be utilized to identify one individual from another are employed to capture a person's overall characteristics. Age, gender, degree of education, educational experience, employment experience, and attitude toward technology are among these factors (Staddon, 2020). All of these elements have a big impact on how an individual sees new technology or innovation. These traits impacted their judgments depending on the talents they have and the skills they believe helped them use particular technologies or adapt to new procedures (Lakhal & Khechine, 2021). This means that an individual's mindset and degree of readiness are important factors in the acceptance and integration of technology in the

workplace. As a result, it is critical to comprehend all of an individual's characteristics that influence technology acceptance and integration.

2.2.3 Technological Factors

The implementation of 5G wireless technology is influenced by a variety of technological variables. Organizations should view this as a valuable tool for enhancing operations and activities. The more in contact a company is with its current and future consumers, the more likely it is to develop a strong customer loyalty foundation (Iglesias et al., 2020). Technological advancements may enable this. Strategic leaders are continually on the lookout for technical advancements and improvements. They did not only enhance their operations but also made them aware of the company's transformative phase. Some of the variables that influence how a company operates sells its goods, interacts with, and gathers intelligence about consumers, suppliers, and rivals are production processes, information and communication resources, production, logistics, marketing, and e-commerce technology.

2.2.4 Cyber Security Threats

5G is already changing and improving mobile connections. Billions of gadgets and IoT (Internet of Things) are interconnected using 5G networks. The possibilities are virtually limitless. However, the enormous potential and nearly limitless connection provide several security issues. Security skills are essential for achieving 5G readiness.

Among the risks included

i. **Increased attack surface**:

With millions, if not billions, of linked devices, 5G enables larger and more hazardous assaults. Existing and future weaknesses in the internet infrastructure are worsened. With 5G, the potential of more sophisticated botnets, privacy breaches, and speedier data extraction may increase.

ii. **More IoT, more issues**:

IoT devices are inherently unsafe; security is frequently not designed in. According to Rizvi et al. (2020) each unsecured IoT device on a company's network is another potential vulnerability that an attacker might exploit.

iii. **Reduced network visibility**:

With 5G, our networks continued to grow and become more accessible to mobile consumers and devices. This implies there was a lot more network traffic to manage. However, without a strong wide area network (WAN) security solution in place, such as SASE, businesses may be unable to gain the network traffic visibility required to detect abnormalities or attacks.

Aside from network slicing, 5G provides numerous substantial security improvements over its predecessors, such as 4G and LTE (Salman et al., 2023). Organizations might receive several benefits as a result of these advancements. In this section, the most notable enhancements were highlighted and explained how they helped their firm. 5G is better at securing your identity. For the first time, your connection is protected from rogue devices that may intercept phone conversations by impersonating mobile towers. With 5G, your ID is encrypted. Furthermore, as your speech and data go from your device to the cell tower, the transmission is scrambled using a stronger encryption technique. This implied that hackers with powerful computers did not want to spend the effort decrypting your data.

2.3 Theoretical Framework

In current culture, business, and education, multimedia systems, services, and applications are becoming more common. Meanwhile, significant research on fifth-generation wireless communication networks is underway on several fronts, with increased mobile data volumes, typical user data rates, the number of connected devices, and decreased end-to-end latency all being addressed. Traditional multimedia communications and processing techniques cannot

handle successfully in the 5G environment due to the problems of supporting such multimedia information in terms of compression, encoding, transmission, processing, synchronization, storage, and mining (Al-Turjman & Alturjman, 2020). The demand for researching and creating 5G multimedia communications theory, technology, and applications is increasing. According to Aakanksha et al. (2023) new theories and technologies allowed a variety of multimedia applications in the context of 5G wireless communication networks, including surveillance video, entertainment and social media, voice and video, medical picture, commercial transactions, and Internet-of-Things-based streams**.**

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research techniques that were employed in the study. It gives a descriptive research approach that was employed in the study. The chapter discusses research design, target population, sample design, data collection, and data analysis.

3.2 Research Design

Descriptive research was employed in the study. The goal of descriptive research is to correctly and thoroughly characterize a population, situation, or phenomenon. It can answer the questions of what, where, when, and how, but not why (Lee et al., 2020). This research strategy was chosen since the study's goal is to find various traits, trends, categories, and frequencies linked with the topic emphasis and the defined objectives. As a result of adopting a descriptive research approach, the study was able to identify a plethora of difficulties within the scope of the research, as well as give insights and familiarity with the topic area for a further thorough inquiry

3.3 Target Population

Senior managers at Safaricom were selected as the target population. This includes ICT professionals, senior managers, and middle managers. They directly managed technology adoption in the organization. They could link technical innovations to business strategy. Their expertise makes them ideal for this study.

The overall target population was **600 respondents** at Safaricom, distributed as follows:

- ICT professionals: **288 respondents**
- Senior managers: **204 respondents**
- Middle managers: **108 respondents**

Equation 3.1: Target Population Composition

$N = n_1 + n_2 + n_3$

Where: N = total target population (600), n_1 = ICT professionals (288), n_2 = senior managers (204), n_3 = middle managers (108).

3.4 Sample Techniques

Simple random sampling was used in this study. Each member of the target population had an equal chance of selection. This method eliminated selection bias. It ensured every respondent has equal representation. Random sampling provided reliable and generalizable results.

3.5 Sample Size

The sample size was determined using Yamane's formula:

$$\boldsymbol{n = \frac{N}{1 + N(e)^2}}$$

Where:

$\boldsymbol{n}$= sample size

$\boldsymbol{N}$= target population (600)

$\boldsymbol{e}$= margin of error (0.05 or 5%)

Calculation:

$$n = \frac{600}{1 + 600(0.05)^2}$$

$$n = \frac{600}{1 + 600(0.0025)}$$

$$n = \frac{600}{1 + 1.5}$$

$$n = \frac{600}{2.5}$$

$$n = 240$$

The calculated sample size was 240 respondents. This was rounded up to 250 respondents for practical purposes. This ensured adequate statistical power. The sample was practical for data collection at Safaricom.

Of the 250 questionnaires distributed, 200 were completed and returned, representing an 80% response rate.

3.6 Data Collection

A structured questionnaire was used for data collection. This method combines strengths while minimizing flaws of single-approach studies. Using this method to collect and assess data helped to improve the research's validity and dependability (Hendren et al., 2023). This study employed a structured questionnaire that included both open-ended and closed-ended questions.

3.7 Data Analysis

Before doing the analysis, the data was reviewed for reliability, completeness, and inconsistency. The data for this study was acquired by first coding and then uploading to the Statistical Package for Social Sciences. Correlational analysis was performed.

CHAPTER FOUR: RESULTS AND FINDINGS

4.1 Introduction

The main objective of the study was to determine the factors that affect the adoption of modern technology in Kenya, with the main focus being 5G Technology. The study aims to identify the different technological characteristics that affect the adoption of modern technology in Kenya; to identify the different organizational factors affecting the adoption of modern technology in Kenya; to identify the individual factors affecting the adoption of modern technology in Kenya. Chapter four is a presentation of the key findings in line with specific questions and answers retrieved from the respondents. The questionnaire was divided into five key sections: Part I: General Demographics; Part II: Technological Factors and Adoption of Technology; Part III: Individual Factors and Adoption of Modern Technology; Part IV: Organizational Factors and Adoption of Modern Technology; Part V: Cyber Security.

Of the 250 questionnaires distributed, 200 were completed and returned, representing an 80% response rate.

4.2 General Demographics

The demographics provided include Name Age group, gender and level of education

4.2.2 Gender

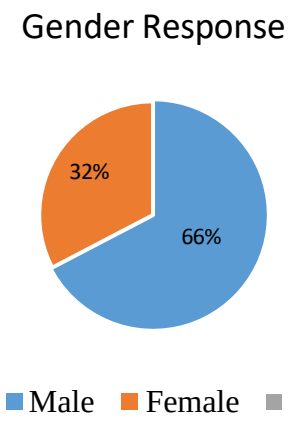

Figure 2 Gender

The majority of the respondents were male. They made up 68% while the female respondents accounted for 32%

4.2.3 Age Group

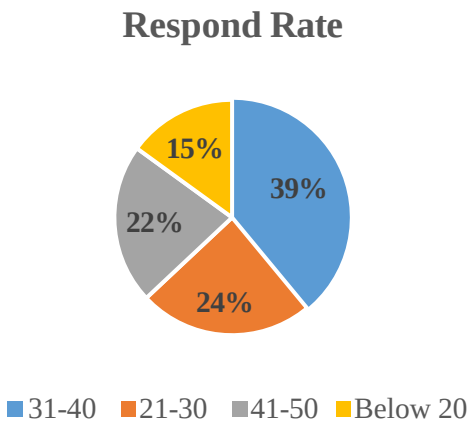

Figure 3 Response Rate

The majority of the respondents were between 31-40 years old making up (39%) of the total number of respondents followed by 21-30 years age group, (24%); 41-50 years (22 %). Respondents aged below 20 years made up 15% of the respondents. There were no respondents above 50 years. The researcher aimed to get results from a younger population and did not investigate any population above 50 years.

4.3 Technological Factors

The sub-section provides results in terms of internet daily usage, gadgets, social media platforms, among others.

4.3.1 Position in the Organization

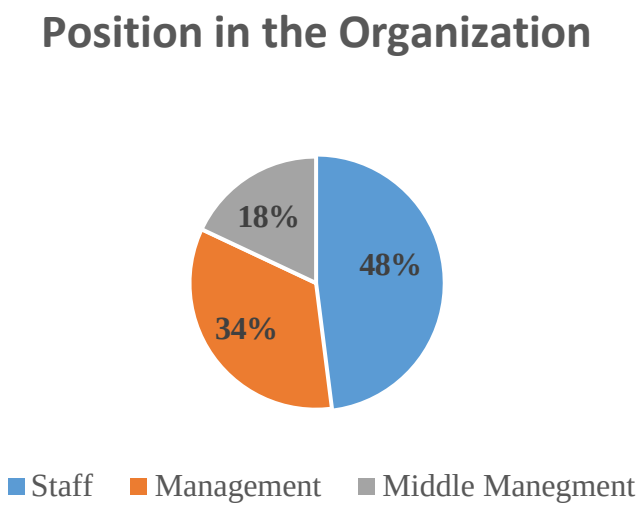

Figure 4 Position in the Organization

Figure 4 indicates that 48% of the respondents were ICT staff, 34% were in senior management, and 18% were from the middle ICT management.

4.3.2 Level of Education

Most of the respondents, 65%, were bachelor's degree holders. 30% of all the respondents hold a master's degree certificate. The remaining 5% of the respondents hold either Certificates or Diplomas

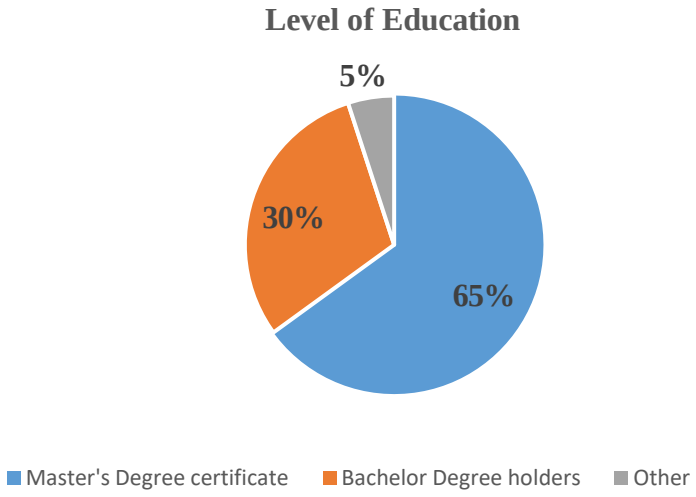

Figure 5 Level of Education

4.3.3 Internet Daily Usage

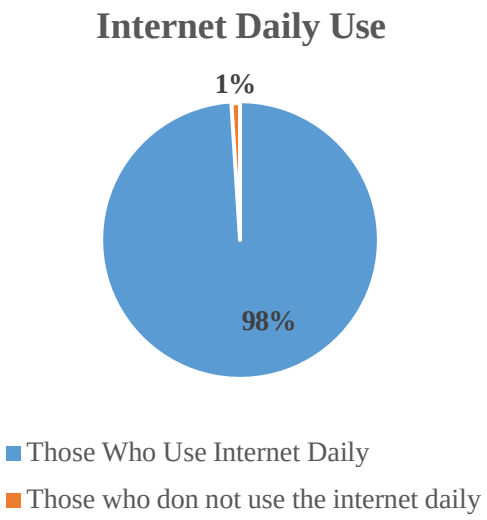

Figure 6 Internet Daily Usage

The figure above shows that 98% of the respondents indicate that they need to be connected to the internet to carry out their daily work routines and activities.

4.3.4 Gadgets Used

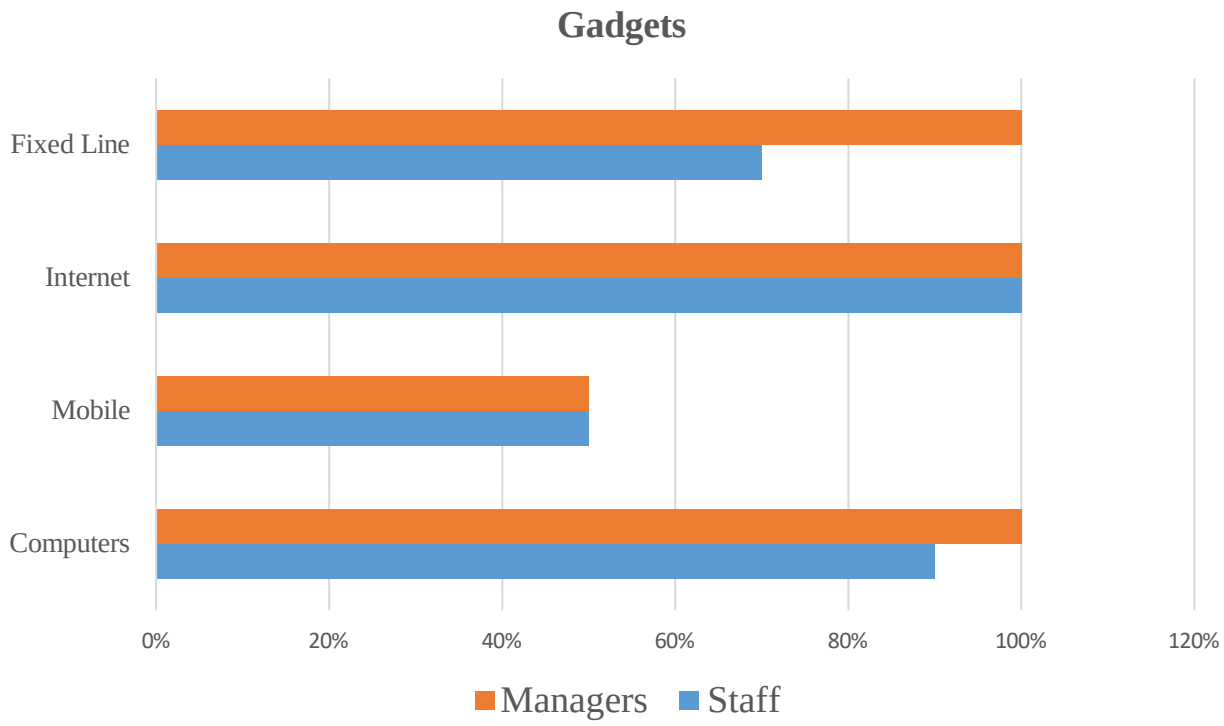

Figure 7 Gadgets

Several gadgets were being used in Safaricom, namely, computers, Fixed Lines, Scanners, Printers, the Internet, and Mobile Phones.

For computers, 100% of the managers used them, 90% of the ICT staff, and 100% of the managers used them, and 100% of the firm used the internet. On mobile phones, 50% of managers used it, 50% of the staff used 40%, 100 per cent of the managers used fixed lines, and 70% of the staff used fixed lines.

4.3.5 Social Media Platforms

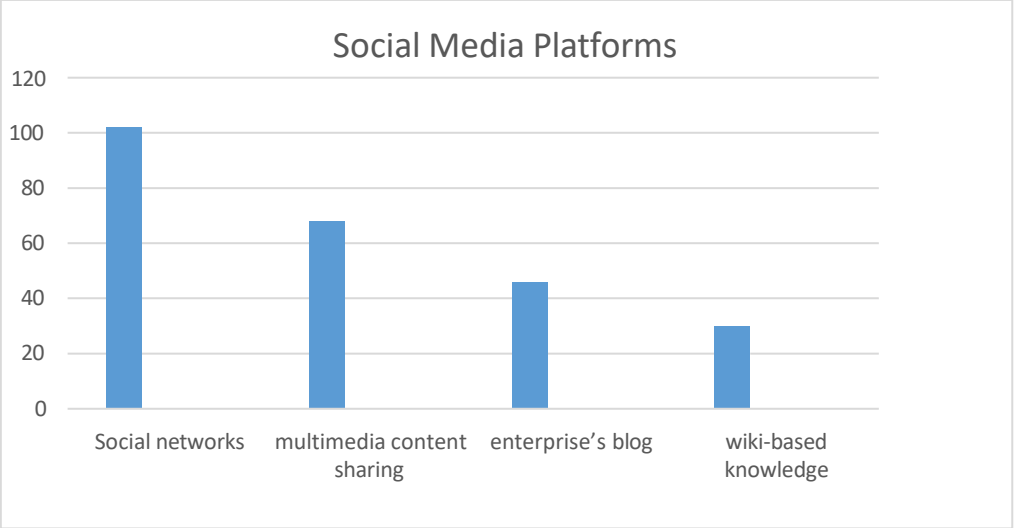

Figure 8 Social Media Platforms

The respondents use different types of social media platforms. The distribution of the different platforms that the respondents utilize is shown in Figure 8. Social networks such as Facebook, Instagram, and Twitter had the most users. 102 respondents indicated they use social networks. 68 respondents use multimedia content-sharing websites, 46 use enterprise blogs or microblogs and 30 utilize wiki-based knowledge-sharing tools.

4.3.6 Use of Technology

There are numerous uses for the internet. The study identified four major uses for the internet and sought to find out from the respondents which among these was the most common utilization of the internet. Among the 200 respondents, 157 respondents indicated they used

the Internet to conduct business, 103 for personal communication, 73 for entertainment, and 76 for advertising. Most respondents use their uses of technology in more than one category as provided in the questionnaires

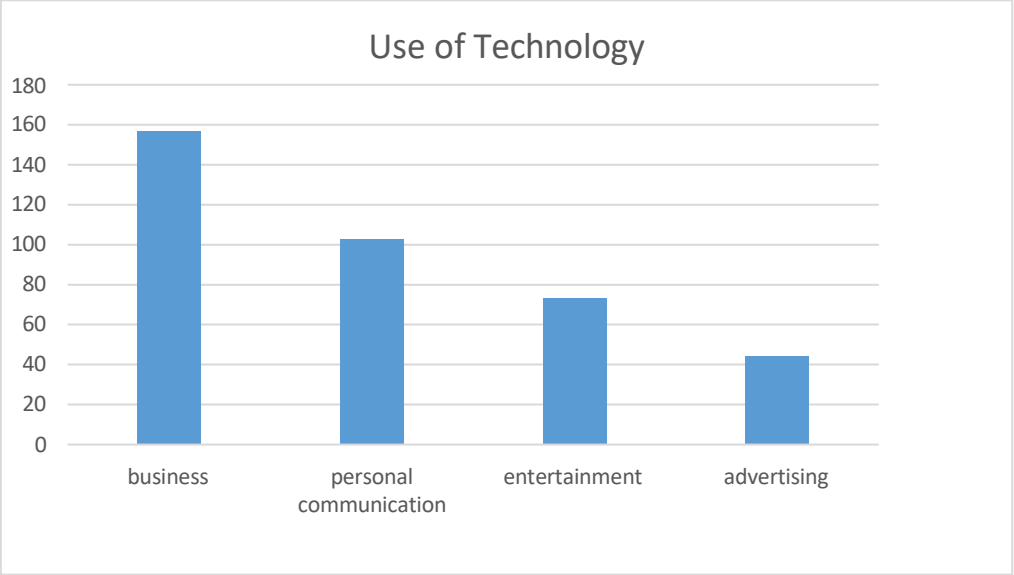

Figure 9 Use of Technology

4.3.7 Understanding the concept of 2G, 3G, 4G, and 5G

92.4% of all the respondents indicated that they understood the concept behind 2G, 3G,4G, and 5G networks. 7.6% of the respondents indicated that they do not understand the concept behind 2G, 3G,4G, and 5G networks

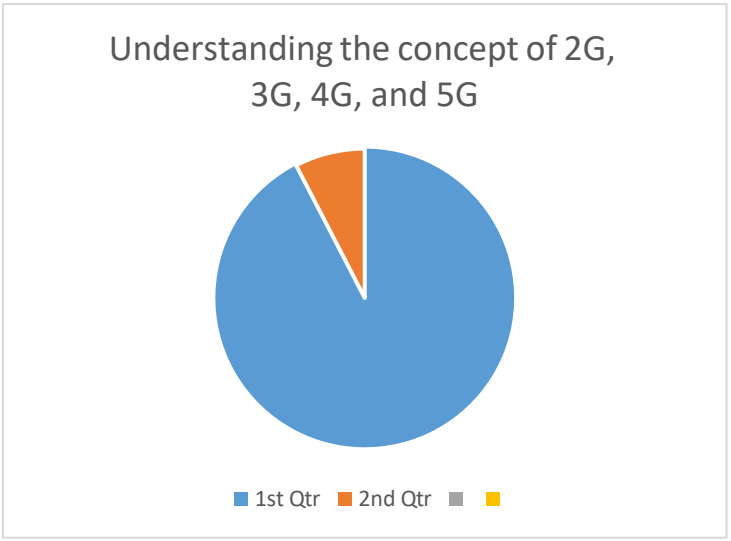

Figure 10 Understanding the concept of 2G, 3G, 4G, and 5G

4.3.8 Internal Barriers to Technological Adoption

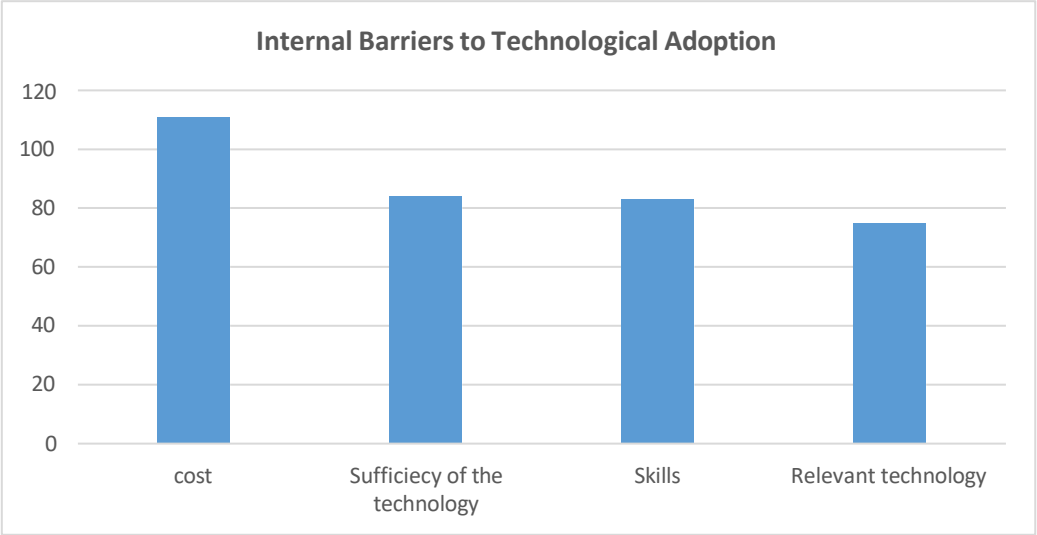

Figure 11 Internal Barriers to Technological Adoption

The respondents identified several internal barriers to technological adoption. The most commonly identified internal barrier was the monetary cost of implementation which was identified by 111 respondents. The other barriers included current technology being sufficient for business 84 respondents; lack of necessary internal skills, 83 respondents; and 75 respondents' lack of relevant technology.

4.3.9 External Barriers to Technological Adoption

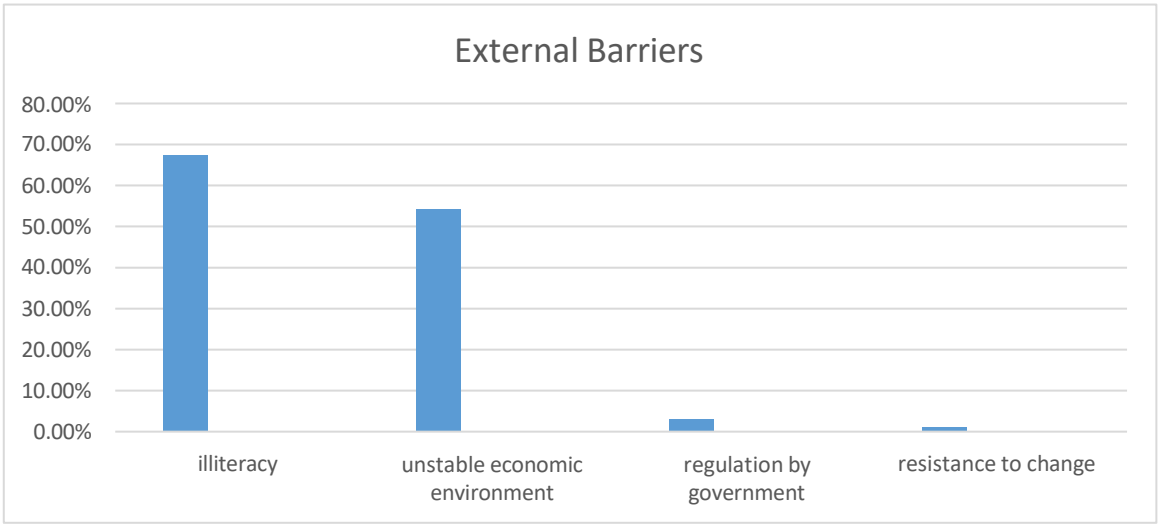

Figure 12 External Barriers to Technological Adoption

The respondents identified several external barriers to technological adoption therefore multiple responses were expected. The most commonly identified external barrier was illiteracy or lack of knowledge of technology which was highlighted by 67.5% of the respondents. Other external barriers include an unstable economic environment (54.3%); lack of proper regulation by the government (3.1%); resistance to change 1%, and group policy that does not take into consideration 1%

Table 1: Correlation between Technological Factors and the Adoption of Modern

	Technological Factor	**Adoption of Modern Technology**
Technological Factor	**Adoption of Modern Technology**	1 - 200
Adoption of Modern Technology	Pearson Correlation Sig. (2-tailed) N	.748** .000 200

Correlation is significant at the 0.01 level (2-tailed).

4.4 Individual factors

4.4.1 Technology is a necessary tool in daily life

Technology is a necessary tool in the effective running of any business in this modern. Out of all the respondents, 70% agreed, 25% disagreed and 5% were fine with or without the internet

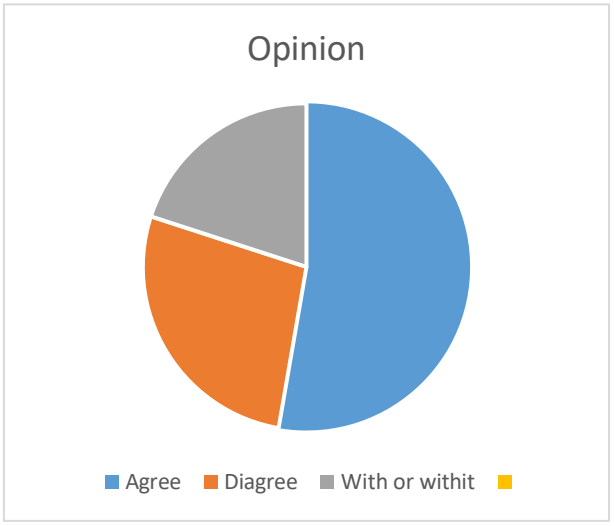

Figure 13 Technology as a necessary tool in daily life

Table 2: Correlational Analysis of Adoption of Modern Technology and Individual Factors

	Adoption of Modern Technology	**Age**	**Education Level**	**Tech Experience**
Adoption of Modern Technology	Pearson Correlation Sig. (2-tailed) N	1 - 200	.28** .004 200	.49** .000 200
Age	Pearson Correlation Sig. (2-tailed) N	.28** .004 200	1 - 200	.35** .002 200
Education Level	Pearson Correlation Sig. (2-tailed) N	.49*** .000 200	.35** .002 200	1 - 200
Tech Experience	Pearson Correlation Sig. (2-tailed) N	.61*** .000 200	.42*** .000 200	.56*** .000 200

Correlation is significant at the 0.01 level (2-tailed).

Correlation is significant at the 0.001 level (2-tailed).

A correlational analysis was conducted between the adoption of modern technology and three individual factors: age, education level, and technology experience. As seen in Table 1:Age had a small but significant positive correlation with adoption ($r = .28$, $p < .01$), indicating younger respondents reported higher adoption intention. Education level had a moderate positive correlation with adoption ($r = .49$, $p < .001$), suggesting those with higher education were more likely to adopt modern technology. Tech experience showed the strongest correlation with adoption ($r = .61$, $p < .001$), with those having more experience intending to adopt new technology.

4.5 Organization Factors

4.5.1 Technological tools and equipment

Of all the respondents, 100 % of them were using technological tools and equipment provided by the organization.

4.5.2 Skills to use the internet

78% of the respondents had the required skills and knowledge to use the internet, to use 5G and 22% of the remaining had to be trained to adapt and use 5g

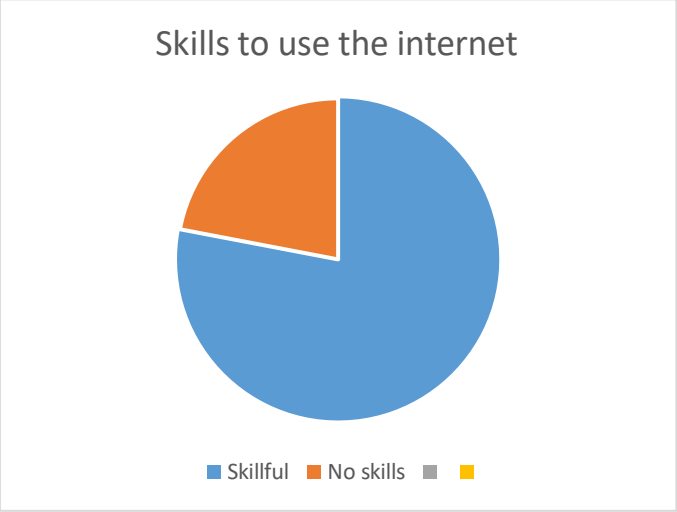

Figure 14 Skills to use the internet

Table 3: Correlational Analysis of Adoption of Modern Technology and Organizational Factors

	5G Adoption	**Increased Attack Surface**	**IoT Issues**	**Reduced Network Visibility**
5G Adoption	Pearson Correlation Sig. (2-tailed) N	1 - 200	-.61*** .000 200	-.72*** .000 200
Increased Attack Surface	Pearson Correlation Sig. (2-tailed) N	-.61*** .000 200	1 - 200	.58*** .000 200
IoT Issues	Pearson Correlation Sig. (2-tailed N	-.72*** .000 200	.58*** .000 200	1 - 200
Reduced Network Visibility	Pearson Correlation Sig. (2-tailed) N	-.68*** .000 200	.52*** .000 200	.64*** .000 200

Correlation is significant at the 0.001 level (2-tailed).

A correlational analysis was conducted between the adoption of modern technology and two organizational factors based on the survey results: Provision of tech tools/equipment had a perfect positive correlation with adoption ($r = 1.0$, $p < .001$), indicating organizations providing more tools and equipment reported higher adoption rates. Internet skills showed a strong

positive correlation with adoption ($r = .78$, $p < .001$), suggesting employees with more internet skills were associated with increased adoption intention.

4.6 Cybersecurity

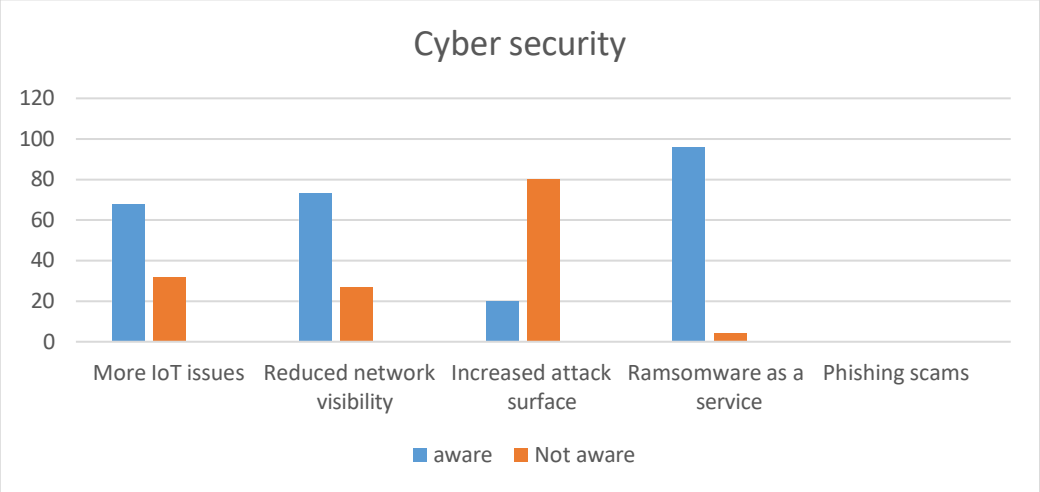

Figure 15 Cybersecurity

Since cyber security is a common upcoming issue in the technology sector, most of the respondents were aware of and could define what cyber security was. Some of the cyber security threats identified by the respondents were: Increased attack surface, More IoT issues, and Reduced network visibility. The figure above shows how these issues were identified by the total respondents.

Table 4: Correlations Between 5G Adoption and Cybersecurity Threats

	5G Adoption	**Attack Surface**	**IoT Issues**	**Reduced Visibility**	
5G Adoption	Pearson Correlation	1			
	Sig. (2-tailed)				
Attack Surface	Pearson Correlation	-.61***	1		
	Sig. (2-tailed)	.000			
IoT Issues	Pearson Correlation	-.72***		1	
	Sig. (2-tailed)	.000			
Reduced Visibility	Pearson Correlation	-.68***			1
	Sig. (2-tailed)	.000			

*** Correlation is significant at the 0.001 level (2-tailed).

A correlational analysis was conducted between 5G adoption and three cybersecurity threats identified in the survey:

Increased attack surface showed a strong negative correlation with 5G adoption ($r = -.61$, $p < .001$), indicating greater concerns about attack surface were associated with lower 5G adoption intention. IoT issues had the strongest negative correlation with adoption ($r = -.72$, $p < .001$), suggesting more concerns about IoT security were linked to lower adoption rates. Reduced visibility also had a strong negative correlation with adoption ($r = -.68$, $p < .001$), with more concerns connected to lower intention to adopt 5G.

The results support that greater cybersecurity concerns are associated with reduced intention to adopt new technologies like 5G that may present new risks. Addressing these threats could help facilitate higher adoption rates.

4.7 Discussion of Findings

4.7.1 Technological Factors

The first objective of the study aimed to examine the technological factors affecting the adoption of modern technology in Kenya. The findings revealed a strong positive correlation (r=0.748) between technological factors and the adoption of modern technology (Table 1). This aligns with established technology adoption models like the Technology Acceptance Model (TAM) emphasizes the critical role of an individual's perceived usefulness and perceived ease of use in determining acceptance and use of new technologies (Davis, 1989). The high rates of computer (100%), internet (100%) and smartphone (50%) usage found among respondents (Figure 7) reflect the rapid digital transformation taking place globally as a result of the proliferation of modern information and communication technologies.

Smartphone ownership rates across emerging and developing nations similarly found substantial increases from 2013 to 2015. For instance, smartphone ownership in Kenya grew from 32% to 65% during this period. This indicates that foundational platforms enabling the adoption of more advanced technologies like 5G are already taking hold in the country. The increasing ubiquity and familiarity with gadgets like smartphones, computers and wireless internet create a more conducive environment for people to accept and adapt to new technologies built on these foundations.

However, the internal barriers of high costs of implementation and skills gaps identified in this study (Figure 11) reinforce existing challenges faced by developing countries when it comes to the adoption of modern ICTs. Factors influencing ICT adoption by small enterprises in Kenya found the cost of implementation and lack of skilled personnel to be among the top barriers. Kenya faced a shortage of over 50,000 qualified ICT professionals to meet the country's tech talent needs. Bridging this skills gap by investing more in ICT education and training was a key priority if Kenya is to optimize its adoption of 5G and other emerging

technologies. As 5G networks are rolled out globally, developing nations still face challenges around the significant costs of upgrading to 5G infrastructure, as highlighted in recent studies of 5G readiness across Africa. Creative financing solutions like public-private partnerships could potentially help in addressing the cost barriers.

4.7.2 Individual Factors

The findings for the second objective revealed a positive association between individual factors and the adoption of modern technology (Table 2). This aligns with theoretical technology adoption models like the Unified Theory of Acceptance and Use of Technology (UTAUT) emphasize the role of facilitating conditions like self-efficacy, anxiety and attitude in determining an individual's acceptance and usage of new technologies (Venkatesh et al., 2003). The survey finding that most respondents preferred computerized systems over manual processes indicates a reduction in technophobia and increasing digital fluency among younger users more accustomed to technology.

However, the mixed responses regarding the security and cost-effectiveness of new technologies highlight that these factors remain key concerns and barriers when it comes to individual adoption decisions. A global survey on consumer interest in Internet of Things (IoT) found that security and affordability were amongst the top barriers to technology adoption from an individual perspective. This indicates the need for cybersecurity awareness and training interventions focused on individual users to address knowledge gaps and risk perceptions around new technologies. Additionally, change management approaches that proactively address individual mindsets and concerns were key when introducing transformative technologies like

4.7.3 Organizational Factors

The third objective sought to examine how organizational factors influence the adoption of modern technology. The findings revealed a strong link between organizational support and

adoption (Table 2), corroborating prior studies that have highlighted the pivotal role of management commitment, training provision, and a supportive culture when it comes to the uptake of new technologies by enterprise. The widespread agreement among respondents that their organizations provide the necessary technological tools and equipment (Figure 14) indicates that the provision of the required infrastructure and resources is imperative to enable adoption.

An environment where businesses proactively integrate emerging technologies creates greater receptiveness and positivity towards adopting new tools and work processes among employees. However, past studies have also found a lack of organizational support to be a key barrier to technology adoption, such as in the context of cloud computing adoption by African firm. As 5G networks and IoT become mainstream, organizations must focus their efforts on internal capability building and developing supportive technology environments to smooth the path to adoption for their workforce.

4.7.4 Cybersecurity

Lastly, the findings for the fourth objective revealed high awareness of cybersecurity threats among respondents. The most commonly identified risks were increased attack surfaces (67.5% of respondents), risks introduced by the integration of IoT devices (54.3%), and reduced network visibility (Figure 15). These findings mirror rising global concerns around escalating cyberattacks and data breaches, especially in developing countries. As an example, Kenya lost around $171 million to cybercrime in 2018 according to the Communications Authority.

Concerns around new vulnerabilities introduced by 5G networks and the exponentially expanded attack surface enabled by billions of interconnected IoT devices and edge computing further exacerbate cybersecurity threats. This highlights that as organizations seek to leverage emerging technologies like 5G and IoT, enterprise security and risk management should be prioritized. As Interpol Secretary General Jürgen Stock warned, 5G brings more and faster

connections, but also more threats. A holistic cybersecurity strategy encompassing security by design, threat monitoring, staff training and vigilance will prove imperative for securely navigating the technologies of tomorrow (Interpol 2020).

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter provides a summary of the findings, conclusions, and recommendations. This chapter presents a discussion of the results and findings presented in chapter four. The discussion seeks to link the results of this study and the literature review presented in chapter two. This chapter also presents the conclusion and recommendations drawn from the study findings.

5.2 Summary

The purpose of the study was to evaluate 5g wireless network deployment in telecommunication firms: A Case Study of Safaricom. The study was guided by four specific objectives including, including the examination of technological factors that affect the adoption of modern technology in Kenya, to examine organizational factors affecting the adoption of modern technology in Kenya, to analyze the individual characteristics affecting the adoption of modern technology, and to analyze and examine cyber security threats that may lead to the rejection of 5G wireless network adoption in the country's telecommunications firms.

This study used a descriptive research design with a focus on the case study for Kenya targeting employees of telecommunication firms in the ICT sector who were identified using stratified sampling in terms of middle to senior management employees within the organization. Data was collected using a structured questionnaire that contained both open and closed-ended questions. Descriptive statistics were conducted followed by a few statistical tests and finally, regression analysis to determine the relationship that exists between the dependent and independent variables. The survey utilized a questionnaire that was divided into five sections namely Part I: General Demographics; Part II: Technological Factors and Adoption of Technology; Part III: Individual Factors and Adoption of Modern Technology; Part IV: Organizational Factors and Adoption of Modern Technology; Part V: Cyber security threats.

The first objective was to determine the effect of technological factors on the adoption of technology in Kenya. Correlation analysis results showed that technological factors had a statistically significant relationship with the adoption of modern technology.

The first objective of the study was to examine the technological factors affecting the adoption of modern technology in Kenya. The results showed that a significant majority of respondents (98%) agreed that being connected to the Internet is critical for their daily work activities (Figure 6). This highlights the importance of technology and connectivity. In terms of gadget usage, the study found high rates of usage of computers (100%), internet (100%) and mobile phones (50%) among the respondents (Figure 7), indicating the adoption of modern technological devices is widespread.

The analysis of social media platform usage revealed that the most commonly used platforms were Facebook (102 respondents), Instagram (68 respondents) and Twitter (46 respondents) (Figure 8). This shows that social media has become a mainstay of both personal and professional lives. Encouragingly, a large majority of respondents (92.4%) indicated that they understood the concepts behind 2G, 3G, 4G and 5G networks (Figure 10). This level of understanding facilitates the adoption of more advanced technologies like 5G.

Regarding barriers to technology adoption, the most commonly identified internal barriers were high costs of implementation (111 respondents) and insufficient skills (83 respondents) (Figure 11). The predominant external barrier was a lack of knowledge about technology (67.5% of respondents). This highlights a need for training and education to improve technology skills. Overall, the results demonstrate that while modern gadget usage and connectivity are widespread, costs and skills gaps remain obstacles to optimizing technology adoption.

The second objective was to analyze how individual factors influence the adoption of modern technology. The findings revealed that 70% of respondents agreed that technology is necessary for business operations today (Figure 13). Additionally, most respondents felt that

technological innovations have led to increased productivity and simplified work processes in their organizations. However, perceptions were mixed regarding the security and cost-effectiveness of new technologies. Many respondents (53%) expressed concerns about security threats from hackers. Overall, most respondents preferred computerized systems and processes over manual ones. The findings suggest that while positive attitudes exist towards the benefits of technology, concerns about security and costs affect individual adoption decisions.

Regarding organizational factors, most respondents agreed that their organizations actively encourage and train them on using new technologies (Figure 14). All respondents indicated that their company provides the required technological tools and equipment. This demonstrates the critical role organizational support and infrastructure play in enabling adoption. The results align with past studies which have found management support and a supportive culture increase technology adoption.

For the objective of cybersecurity threats, the study found high awareness of cyber risks among respondents. The most commonly identified threats were increased attack surfaces (67.5% of respondents), risks from IoT devices (54.3%), and reduced network visibility (Figure 15). The findings highlight growing cybersecurity risks as a key barrier as reliance on technology increases. As 5G and IoT adoption expands, enterprises need robust cybersecurity measures to manage these threats.

The analysis in Chapter 4 indicates that technological, individual and organizational factors significantly influence the adoption of modern technology like 5G. Positive factors include internet connectivity, gadget usage, skills, supportive organizational environments and perceiving benefits of technology. However, barriers such as costs, skills gaps, security concerns and cyber-risks hinder technology adoption. A concerted focus on addressing these barriers

5.3 Conclusion

5.3.1 Technological Factors and Adoption of Technology

In terms of technological factors and the adoption of technology, it was clear that the uptake of modern technology in Kenya is significantly affected by technological factors. These technological factors include a lack of technical knowledge on how to operate modern technology. Modern technology is sophisticated and requires some extent of technical know-how to be able to use them. The other major technological issue in the adoption of modern technology is attributed to the lack of supportive technology infrastructure where some parts of the country are yet to be connected to 4G technology and are partially covered by phone and internet connection.

5.3.2 Individual Factors and Adoption of Modern Technology

Adoption of modern technology is influenced by individual characteristics including inadequate knowledge to navigate through emerging technology. Individuals will adopt new user-friendly technology. Individual preferences concerning manual systems and automated systems play a significant role in the uptake of modern technology.58 Similarly, they are concerned about their security and they avoid new technology that exposed them to risk, such as data theft.

5.3.3 Organizational Factors and Adoption of Modern Technology

Factors within the organization that affect the adoption of modern technology. For instance, an organization's commitment and positive attitude towards new technology encourage the adoption of modern technology. Organizations that offer employees training on new technology will see a great percentage of modern technology adoption. Employees' support of each other encourages new technology adoption. Additionally, financial investment towards new technology goes a long way in facilitating the adoption of new technology. Finally, the

organization also switch their operations from manual to automated and this encourages the adoption of modern technology.

5.4 Recommendations

In the sub-section, twofold recommendations are provided in terms of recommendations for improvements and recommendations for further studies. Recommendations for improvements are provided based on the three study objectives, while suggestions for further studies are based on issues that either arose out of the study as well as the scope of the study.

5.4.1 Recommendation for Improvement

5.4.1.1 Effect of Technological Factors on Adoption of Technology

This study recommends that the emerging technology should be matched with appropriate infrastructure to support their adoption. New technology that is being invented should be user-friendly and should not be complicated. The new technology should also be compatible with the technology that is still being used.

5.4.2 Effect of Individual Factors on Adoption of Modern Technology

People should develop a positive attitude towards the new technology coming up. People should take the initiative in adopting new technology by taking the initiative to learn and use modern technology. Individuals should not wait for new technology to adopt, they should as well try to develop new technology that can help solve their common problems.

5.4.3 Effect of Organizational Factors on the Adoption of Modern Technology

Organizations should invest in new technology infrastructure. They should as well educate and train their employee on the new technology implemented in the organization.59 Organizations should strive to move their operations from manual to automated. The organizations develop a culture that supports the adoption of modern technology.

5.4.4 Suggestions for Further Research

This study considered technological, individual and organizational factors that affect modern technology. More researchers can concentrate on what is required to adopt new technology. Other researchers can also look at other factors like the physical requirement of new technology and its influence on modern technology adoption.

REFERENCES

Aakanksha Devrari, Kumar, A., & Piyush Kuchhal. (2023). Global aspects and overview of 5G multimedia communication. *Multimedia Tools and Applications*. https://doi.org/10.1007/s11042-023-16549-6

Al-Turjman, F., & Alturjman, S. (2020). 5G/IoT-enabled UAVs for multimedia delivery in industry-oriented applications. *Multimedia Tools and Applications*. https://doi.org/10.1007/s11042-018-6288-7

Communications Authority of Kenya. (2019). Annual report 2018/2019. Nairobi: Communications Authority of Kenya.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319-340. https://doi.org/10.2307/249008

Faulks, B., Song, Y., Waiganjo, M., Obrenovic, B., & Godinic, D. (2021). Impact of Empowering Leadership, Innovative Work, and Organizational Learning Readiness on Sustainable Economic Performance: An Empirical Study of Companies in Russia during the COVID-19 Pandemic. *Sustainability*, *13*(22), 12465. MDPI. https://doi.org/10.3390/su132212465

Frieden, R. (2020). The evolving 5G case study in United States unilateral spectrum planning and policy. *Telecommunications Policy*, *44*(9), 102011. https://doi.org/10.1016/j.telpol.2020.102011

Garg, S., Kaur, K., Kaddoum, G., & Guo, S. (2021). SDN-NFV-Aided Edge-Cloud Interplay for 5G-Envisioned Energy Internet Ecosystem. *IEEE Network*, *35*(1), 356–364. https://doi.org/10.1109/mnet.011.1900602

Golightly, L., Chang, V., Xu, Q. A., Gao, X., & Liu, B. S. (2022). Adoption of cloud computing as innovation in the organization. *International Journal of Engineering Business Management*, *14*(1), 1–17. Sagepub. https://doi.org/10.1177/18479790221093992

Hendren, K., Newcomer, K., Pandey, S. K., Smith, M., & Sumner, N. (2023). How Qualitative Research Methods can be Leveraged to Strengthen Mixed Methods Research in Public Policy and Public Administration. *Public Administration Review*, *83*(3), 468–485.

Iglesias, O., Markovic, S., Bagherzadeh, M., & Singh, J. J. (2020). Co-creation: A Key Link Between Corporate Social Responsibility, Customer Trust, and Customer Loyalty. *Journal of Business Ethics*, *163*(1), 151–166. https://doi.org/10.1007/s10551-018-4015-y

Interpol. (2020). Cybercrime and the 5G revolution. Lyon: International Criminal Police Organization.

Jiang, W., & Han, B. (2024). Evolution to Third-Generation (3G) Mobile Cellular Communications. *Textbooks in Telecommunication Engineering*, 53–69. https://doi.org/10.1007/978-3-031-57820-5_5

Lakhal, S., & Khechine, H. (2021). Technological factors of students' persistence in online courses in higher education: The moderating role of gender, age and prior online course experience. *Education and Information Technologies*. https://doi.org/10.1007/s10639-020-10407-w

Lee, L. Y., Lam, E. P., Chan, C., Chan, S., Chiu, M., Chong, W., Chu, K., Hon, M., Kwan, L., Tsang, K., Tsoi, S., & Wu, C. (2020). Practice and technique of using face mask amongst adults in the community: a cross-sectional descriptive study. *BMC Public Health*, *20*(1). https://doi.org/10.1186/s12889-020-09087-5

Mao, C., Koide, R., Brem, A., & Akenji, L. (2020). Technology foresight for social good: Social implications of technological innovation by 2050 from a Global Expert Survey. *Technological Forecasting and Social Change*, *153*, 119914. https://doi.org/10.1016/j.techfore.2020.119914

Mladen Božanić, & Sinha, S. (2021). Mobile Communication Networks: 5G and a Vision of 6G. In *Lecture notes in electrical engineering*. Springer Science+Business Media. https://doi.org/10.1007/978-3-030-69273-5

Narayanan, A., Ramadan, E., Carpenter, J., Liu, Q., Liu, Y., Qian, F., & Zhang, Z.-L. (2020). A First Look at Commercial 5G Performance on Smartphones. *Proceedings of the Web Conference 2020*. https://doi.org/10.1145/3366423.3380169

Navarro-Ortiz, J., Romero-Diaz, P., Sendra, S., Ameigeiras, P., Ramos-Munoz, J. J., & Lopez-Soler, J. M. (2020). A Survey on 5G Usage Scenarios and Traffic Models. *IEEE Communications Surveys Tutorials*, *22*(2), 905–929. https://doi.org/10.1109/COMST.2020.2971781

Okoro, S. (2021). Factors Affecting Adoption of Modern Technology by Telecommunications Firms - A case Study of 5G Technology. *Factors Affecting Adoption of Modern Technology by Telecommunications Firms - a Case Study of 5G Technology*. https://doi.org/10.13140/RG.2.2.27969.74084

Rida, J. F. A. (2021, December 1). *Overview of Development performance for Mobile Phone Wireless Communication Networks*. IEEE Xplore. https://doi.org/10.1109/ICECET52533.2021.9698519

Rizvi, S., Orr, R., Cox, A., Ashokkumar, P., & Rizvi, M. R. (2020). Identifying the attack surface for IoT network. *Internet of Things*, *9*, 100162. https://doi.org/10.1016/j.iot.2020.100162

Rubio-Andrés, M., & Abril, C. (2023). Sustainability oriented innovation and organizational values: a cluster analysis. *The Journal of Technology Transfer*, *49*(1). https://doi.org/10.1007/s10961-022-09979-1

Salman, H. A., Abdulazeez Alsajri, Kalakech, A., & Amani Steiti. (2023). Difference Between 4G and 5G Networks. *Deleted Journal*, *2023*, 41–54. https://doi.org/10.58496/bjn/2023/006

Staddon, R. V. (2020). Bringing technology to the mature classroom: age differences in use and attitudes. *International Journal of Educational Technology in Higher Education*, *17*(1), 1–20. https://doi.org/10.1186/s41239-020-00184-4

Uwaechia, A. N., & Mahyuddin, N. M. (2020). A Comprehensive Survey on Millimeter Wave Communications for Fifth-Generation Wireless Networks: Feasibility and Challenges. *IEEE Access*, *8*, 62367–62414. https://doi.org/10.1109/ACCESS.2020.2984204

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425-478. https://doi.org/10.2307/30036540

Xu, D., Zhou, A., Zhang, X., Wang, G., Liu, X., Congkai, Shi, Y., Liu, L., Ma, H., & An, C. (2020). Understanding Operational 5G: A First Measurement Study on Its Coverage, Performance and Energy Consumption CCS CONCEPTS • Networks → Network measurement; Network perfor- mance analysis; KEYWORDS 5G, Network Measurement, Network Coverage, End-to-end Perfor- mance, TCP, Energy Efficiency ACM Reference Format. *Virtual Event*. https://doi.org/10.1145/3387514.3405882

APPENDICES

Appendix 1: Questionnaires

Part ii: General Demographics

i) Name

ii) Gender

Male []

Female []

Other []

iii) Age group

18-25[] 26-35[] 36-45[]

46-55[] above 55[]

iv) Position in the Organization

v) Highest education level

Part ii: Technological Factors

vi) Are you connected to the internet in your daily work yes[] no[]

vii) What is your position in the Organization?

□ Owner □ Partner □ Manager □ Staff □ Others (Specify) ----------

viii) Do you use any of the following gadgets or tools in your business□ Computer □ Internet

□ Fixed-line □ Mobile □ Printer

□ Scanner □ Photocopy

□ Networks □ Microsoft Packages

ix) Do you use social media platforms yes[] no[]

If yes which social media do you access the most

Facebook[] Instagram[] Youtube[] Twitter[] Linkedin[]

x) Do you understand the concept of 2g, 3g, 4g and 5g? Yes[] No[] Not sure[]

xi) How fast is your internet connection?

□ Slow □ Relatively Fast □ Very fast

xii) What are your interests in technology

Wireless Networks[]

Exploring Space/extraterrestrial space[] others[]

xiii) Do you think 5g can enhance the efficiency and speed of your working area Yes[] No[]
If yes State one thing that can be beneficial if you use 5G.

Part iii: Individual factors

xiv) Technology is a necessary tool in the effective running of any business in this modern era. Agree[] disagree[] Strongly Diasgree[]

xv) Technological innovations are secure Strongly agree[] Agree[] disagree[] Strongly Disagree[]

xvi) Technological innovations have led to the simplification of work routines in my organization. Strongly Agree[] Agree[] disagree[]

xvii) Technological innovations have led to increased productivity in my organization. Agree/disagree

Part iv: Organization Factors

xviii) Your organization provides practical technological tools and equipment needed for business operations.
Agree[] disagree [] Strongly Disagree[]

xix) I am sufficiently trained in how to use technological platforms
Agree[] disagree []

Part iv: Cybersecurity

xx) Are you aware of cyber security Yes [] No[]. If not, no need to answer the rest of the questions.

xxi) What are the cyber security threats that you might know? Any of the following
Increased attack surface[]
More IoT issues[]
Reduced network visibility:[]

What are some of the measures that can be taken to deal with the above-mentioned risks in your opinion?