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HOW THE USE OF MODERN-DAY TECHNOLOGY CAN ENHANCE
SAFETY AND SOLVE MAJOR SECURITY PROBLEMS IN GREENCROFT
HARARE.

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF
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ABSTRACT

Harare the capital city of Zimbabwe has experienced an increase in crime rates over the past couple of decades and these crimes have started infiltrating residential areas, namely Greencroft. The current security measures in the country have not been able to combat this issue and therefore the aim of this study was to analyse the use, effectiveness and acceptance of modern-day technology as a tool to enhance the safety and security of the Greencroft residents, as well as to bring awareness to the issues the suburban area currently faces. Physical interviews and Google form questionnaires were used as the key data collection tools for both physical and online. The results were analysed and manipulated using Microsoft Excel and the findings were recorded as received. The study proved that the majority of the residents seemed to be knowledgeable of current safety and security technology in the world and a reasonable number of respondents were willing to rely on one or more of the technologies proposed to enhance safety and security. It is then recommended that further research should be conducted, one which involves a pilot study and a wider population size as the research only focused on the results of one neighbourhood in Harare as a representation of the acceptance of technological advancements in the residential areas of Harare.

Keywords: Safety and security, modern-day technology, Greencroft, effectiveness, residential area, crime

DECLARATION

I **RANGARIRAI PANASHE MUDIWA MANDIVENGA** declare that this dissertation is my original work except where sources have been cited and acknowledged. The work has never been submitted, nor will it ever be submitted to another university for the award of a degree

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Dedication

This project is dedicated to my family who were a source of inspiration throughout my studies. Through it all you managed to support, encourage and believe in me. I love you all and may God bless you. This project is also dedicated to myself, as a testament of the hard work I have put in towards bettering my life and reaching the level of success I wish to attain. Lastly, this project is dedicated to God because it is through Christ who strengthens me that I have been able to make it this far life and undertake this research.

List of Acronyms and Abbreviations

IOT – Internet of Things

AI – Artificial Intelligence

CCTV – Closed Circuit Television

CR – Crime Rates

T-O-E – Technology, Organization and Environment

Tech - Technology

TAM - Technology Acceptance Model

UTAUT- Unified Theory of Acceptance and Use of Technology

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CHAPTER 1: INTRODUCTION

1.1 Introduction

The Zimbabwean economy is in a spiral and on the verge of collapse. With the country in a recession, coupled with population increases, this creates a deficit in the number of resources that are available in order to sustain inhabitants of the country. As the number of citizens outweighs the number of jobs available, the people have resorted to petty crime in order to make ends meet. However, over the past decades the crime rates in the Capital city of Harare have gone higher at a much faster pace and the measure currently in place have failed to effectively neutralize this problem. Residential areas have suffered and bared witness to the newly grown cases of crime in the suburbs. One of these neighbourhoods is Greencroft and it has had people report multiple burglary attempts in the last couple of years, including missing people reports.

However, on the other side of the world, safety and security technology keeps evolving and the world follows directly behind it. Thus is the law of life, an increase in the supply of something will lead to the increase in the demand of it (Esper at el, 2010). Developed countries have adapted to relying on technology to solve their security and safety issues and as a result, crime rates have dropped in countries that have street surveillance systems and smart tech devices (Stephens. 2003).

This study takes a look at how the use of this modern-day technology and how implementing it can enhance the safety and security of the residents of Greencroft and the population of the Harare residential areas as a whole, also taking note of how aware people are of these technological advancements and their opinion and acceptance of it.

1.2 Background

Harare, the capital city of Zimbabwe has been facing security challenges for many years. The city's population has grown rapidly over the past few decades, and this in turn has led to an increase in crime rates which the current security forces have failed to effectively combat. Greencroft is a low-density suburb located in Harare and its' residents have fallen prey to the increase in crime rates in Harare. The use of modern-day technology has transformed many aspects of society on a global scale, including security and safety. Therefore, the use of this

modern-day technology has been proposed as a potential solution to enhance the safety and security of the residents of Greencroft and the population of Harare as a whole. Hence, the purpose of this study is to explore the use of modern-day technology and its potential to solve the security challenges in Greencroft, Harare.

1.3 Statement of the Research Problem

The security challenges in Harare have been a cause of concern for the government and citizens alike. Despite the efforts of the security forces, crime rates continue to rise, and many suburbs remain vulnerable to various security threats. There is a need for a more effective approach to enhance safety and security in the city. The proposed solution is the use of modern-day technology. However, there is a lack of research on the effectiveness of modern-day technology in solving security challenges in Harare's suburbs. Therefore, the research problem is: What is the effectiveness of modern-day technology in enhancing safety and solving major security problems in Harare's suburbs such as Greencroft?

1.4 Justification / Rationale of the study

The proposed study is essential because it addresses a critical issue that affects the safety and security of Harare's suburban residents. The study will in turn provide insights into the effectiveness of modern-day technology in enhancing safety and solving security problems in the city. The results of this study will aid policy maker, security forces, the general public and other stakeholders to make informed decisions regarding the use of technology to address security challenges. Additionally, the study's findings will also contribute to the existing body of knowledge on the use of technology to enhance safety and security in urban areas. Amongst others, the findings of this study will also be useful to inform the development of policies and strategies to combat security issues being faced by Harare and other cities in Zimbabwe.

1.5 Research Objectives:

The main research objective of this study is to investigate how the use of modern-day technology can enhance safety and solve major security problems in Greencroft, Harare. The specific objectives of the study are as follows:

1. Assess the current security challenges faced by Greencroft Harare residents
2. Analyse the potential of modern-day technology in addressing security challenges in Greencroft Harare
3. Determine the effectiveness of existing security measures in Greencroft Harare
4. Establish the most suitable modern-day technology to enhance safety and solve security problems in Greencroft Harare
5. Evaluate the impact of modern-day technology on enhancing safety and solving security problems in Greencroft Harare.

1.6 Research Questions:

1. What are the current security challenges faced by residents of Greencroft Harare?
2. In what ways can modern technology be used to address security challenges in Greencroft Harare?
3. How effective are the existing security measures in Greencroft Harare?
4. What modern day technologies are most suitable for enhancing safety and solving security problems in Greencroft Harare?
5. What is the impact of modern-day technology on enhancing safety and solving security problems in Greencroft Harare?

1.7 Operational Definitions of Key Terms and Concepts

- **Modern-day technology:** Refers to the latest advancements in technology such as artificial intelligence (AI), Internet of Things (IOT) and Big Data. Also giving reference to a range of technological innovations that are designed to enhance security and safety, namely surveillance cameras, biometric systems and remote sensors.
- **Enhancing safety:** Refers to the measures taken to reduce the risk of harm or danger to people and property.
- **Security challenges:** Refers to the issues that threaten the safety of individuals, groups or property, such as, crime and terrorism.

1.8 Outline of the Research Project

This research is organized into 5 chapters. Chapter 1 provides an introduction to the study, including the background, research problem, justification, research objectives, research questions and operational definitions of key-terms and concepts. Chapter 2 provides a literature review of relevant research on the use of modern-day technology in enhancing safety and solving security challenges. Chapter 3 presents the research methodology, including the research design, data collection methods, data analysis and ethical considerations. Chapter 4 presents the results of the study, including a discussion of the findings and their implications. Finally, chapter 5 presents the conclusions of the study, including the main findings, implications for policy and practice. The project also includes a reference list and appendices.

1.9 Assumptions

1. The residents that respond will give responses that are unbiased
2. Majority of the respondents are computer literate
3. The chosen sample will accurately represent the population of Greencroft
4. The majority of the residents will be willing to disclose their personal household information (The number of people living in their house]
5. The study will be carried out within the given time limit

1.10 Significance of the study

There is a limited body of knowledge in regards to technological advancements in the safety and security industry and how these innovations can be implemented in modern homes. This study will aid in contributing to the already growing body of knowledge on how technology can enhance safety and security in Harare's urban areas and the nation as a whole.

The findings of this study will provide both local and national governments with practical data on the acceptance, methodology and type of technological advancements being utilized

in residential areas across the globe, and how these advancements can also be implemented in Greencroft and the country as a whole. These findings can aid in influencing policies on the use of technology as well as government expenditure in the security sector of Zimbabwe.

In addition, the findings of this study will help to shed light on the current issues being experienced in residential houses in Greencroft as well as providing awareness to internal and external stakeholders on the use of digitalized safety and security systems such as emergency applications, surveillance and biometric equipment as tools to combat these safety and security issues.

Furthermore, the study's research methodology and findings will assist in adding on to the existing body of knowledge of theoretical framework models that are implemented throughout the duration of the investigation. This will give reference to these models in the practical use of how individuals adopt to the use of technology in enhancing safety and security.

Lastly, the study's findings will benefit other developing countries in analysing the effectiveness, usage and acceptance of technological innovations as a tool to battle safety and security issues in residential areas, giving the suburb of Greencroft, Harare as a case study

1.11 Delimitations of the study

These are the factors/variables that have the potential to limit or narrow the scope of the research:

1.11.1 Sample Size

Greencroft is a small neighbourhood in Harare's suburban area and its population sample might not be an appropriate representation of how technology is accepted amongst the city's other residential areas. Additionally, the selected streets and houses might have a bias in regards to the crime rates in that area based on various factors such as some roads have neighbourhood watch stations and some do not.

1.11.2 Geographical Scope

Due to the fact that the researcher is a student based in Mutare during the time of the study, they in turn have to commute to and from Harare regularly in order to collect data and this would prove to be very strenuous, both financially and physically and might limit the amount of data that can be collected.

1.11.3 Time Scope

Greencroft has a population of approximately 10325 people and the research were carried out over a time span of 2022-2023. Having to balance both school commitments and data collection can prove to be very time strenuous for the researcher.

1.21 Limitations of the study

1.12.1 Nature of Data

Due to the nature of the study, in order to obtain accurate results on the security measures used in the respondents' homes, it relied strongly on the ideology that the respondents would have to trust the researcher and the probability of this happening posed a threat to collecting inaccurate data due to the fact that respondents had to disclose sensitive information about their homes. This nature of the information needed would pose a threat to respondents and it would leave room for respondents to lie in order to ensure their safety after filling out the questionnaires

1.12.2 Restriction on data collection

The researcher has to craft questions that are not too personal to the respondents and this in turn posed a threat of using questionnaires that did not ask the right questions meaning that they would have a high chance of receiving invalid information because security and safety data is interpersonal.

1.12.3 Limitation in Resources

A faster, wider and more efficient research could be carried out but this might not be possible due to the fact to financial limitations, lack of man power and the lack of the appropriate technology needed such as microphones, cameras and even voice anonymity devices (Voice scramblers used to protect the identity of the respondents).

1.12.4 Time Restrictions

Due to the fact that the proposed study is accompanied with a deadline, the data collection has a time limit constraint and this puts the research at risk of not having enough data collected or having scrappy findings due to the hurried nature of the research.

Potential tools to enhance safety in Urban Areas

CHAPTER 2: REVIEW OF RELATED LITERATURE

2.1 Introduction

Harare is the capital city of Zimbabwe, and like many other cities around the world, it faces a range of security challenges. These challenges include crime, terrorism, natural disasters, and accidents. Modern-day technology has the potential to enhance safety and security in Harare's suburbs by providing innovative solutions to these problems. This literature review aims to explore the use of modern-day technology in enhancing safety and security in Harare's suburbs. The reviewed documents will be obtained from various sources, such as journal articles, websites, and other publications from well-established authors.

2.2 Themes in Existing Literature

2.2.1 Analogue Tools

Before the integration and creation of technological instruments as a measure combat household invasions and intrusions, citizens relied on analogue tools to protect their homes. These analogue tools include padlocks, door locks, door screen frames, burglar bars for windows, sufficient lighting, fencing and the use of steel and metal safes. (Heide&Jacobs, 1978). The majority of these techniques and tools are still being used in modern-day as a form of prevention against unlawful and unauthorized entry into residential households

2.2.2 Alarm Systems

People have adapted to the use of alarm systems as a secure security measure to protect their houses from unauthorized entry. These alarm systems are designed to stop any external unauthorized entry and alert the home owners of any attempts. That is, alarm systems aim to stop intruders that breach homes through window openings, ceilings, vents and tampering with the door and window locks. Modern development has allowed alarm systems to be accompanied with motion detectors to prevent these sorts of breaches. How it works is that “the intruder alarm security is initiated by a cycle, from a comprehensive automated circuit loop that is closed with an alarm at its output, an indication to inform the owner of danger.” (Cavas & Ahmad, 2019, p3). The alarm system as a whole is wired with sensors circulating the household with a trigger to then alert the central monitoring system to prompt a sound of some sort to alert the residents of the house that alarm has been triggered. Although these alarm systems are widely used and have proven to reduce theft in a number of areas, they are only limited to noise mechanisms and not capturing mechanisms, although recent modes in banks have started implementing this feature. (Shah at el, 2014)

2.2.3 Surveillance

One of the themes identified on the security practices currently used worldwide to enhance safety is the use of surveillance systems such as Closed-Circuit Television (CCTV). In past years, multiple studies have shown that people voted more for surveillance and recognition systems being used as compare to other security measures. This is supported from a Business

week survey that was conducted in America soon after a terrorist attack in September 2001 and 63% of the respondents voted for the use of surveillance systems and 86% of the adults interviewed were in favour of using facial recognition software's to identify criminals (BusinessWeek online, 2001). Countries such as America had already started carrying out research on the use of surveillance systems as early as 1997 (Nieto, 1997).

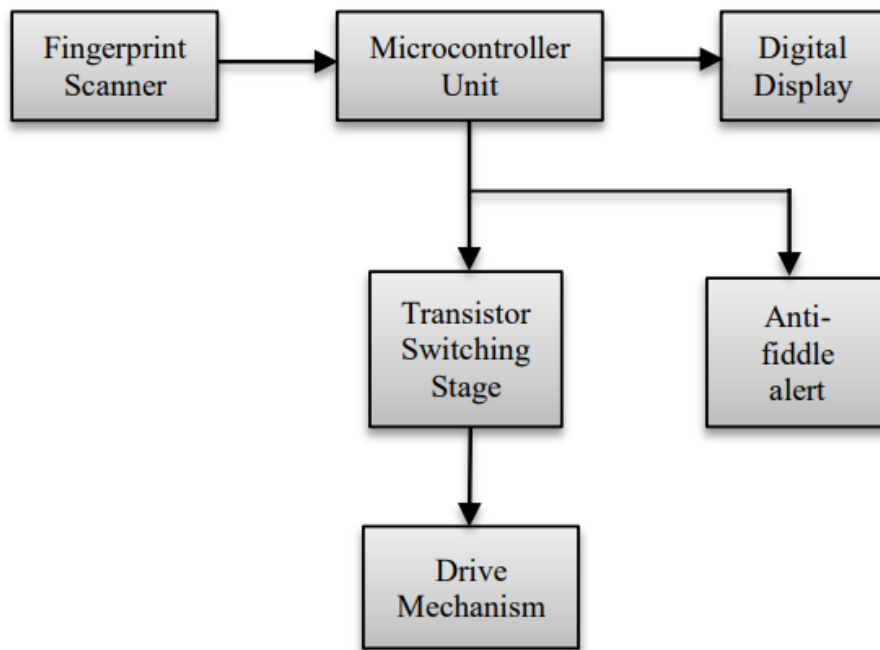
In the words of Howard Levison, a security expert and consultant, “ You don't need 4000 FBI agents on the streets when you've got 4000 video cameras on the street that can recognize people” (Evangelista, 2001) the world drew closer to accepting technological advancements, the use of surveillance as a security and safety measure increased as well, as of 2016 the use of surveillance cameras had increased and approximately 350 million cameras were in use worldwide (IHS, 2016) and the number of cameras in use keeps growing at a rapid speed till date. These street CCTV cameras have revolutionized and evolved and are now being implemented into residential alarm systems to enhance the safety and security of individuals in homes too (Kaur et al, 2016). However, although these technologies are widely used, there are also concerns about privacy violations and the potential for misuse of these technologies such as surveillance hacking (Quintin & Maass, 2015)

2.2.4 Biometrics

A biometric system uses genetic features such as DNA, fingerprints, Iris, face, voice and facial thermogram to authenticate a user to gain access into their home. As well as having biometric readers, these systems often come accompanied with pins, passwords and paraphrases to create an extra layer of security. When both authenticators have granted access, the user will then be permitted to enter (Ishengoma, 2014).

When it comes to biometric authentication, as compared to other unique features, the fingerprint is the most used body part for authentication in residential homesteads. Studies have shown that modern homes have now adopted to the use of doors equipped with smart locking control mechanisms that are integrated with fingerprint scanners and microcontrollers (Afolbi & Alice, 2014) A fingerprint can be joined into an Internet of Things (IOT) system usually in smart homes with the goal of connecting the scanners to mobile devices (Tobing, 2014). The figure below shows an example of a door with a fingerprint scanner. The architecture of the fingerprint door below was proposed by (Afolbi & Alice, 2014).

Figure 1 The architecture of a fingerprint door



Afolabi, Adeolu Olabode, & Alice, Oke. (2014). On Securing a Door with Finger Print Biometric Technique. *Transactions on Machine Learning and Artificial Intelligence*, 2(2), 86-96.

The door above has a fingerprint sensor SN-FOR-UART and microcontroller PIC16F648A. The fingerprint sensor takes the biometric signature of the individual's fingerprint and runs it through the microcontroller unit which is used to control all of the door's security and locking mechanisms. The system also has a digital display screen to show the operational status of the door, if authentication is granted or denied, the door movement mechanism that moves either clockwise or anti-clockwise will respond accordingly given the status of the authentication. Although this door can effectively keep intruders out, some professionals have argued that merely depending on a fingerprint sensor is not wise because it is quite simple to put someone's fingerprint on something and reproduce it (IJNCAA, 2019 p44).

2.2.5 Communication technologies

Another theme is the use of communication technologies such as mobile phones and social media platforms to enhance emergency response and disaster management. In the aftermath of

natural disasters such as earthquakes and hurricanes, social media platforms have been used to coordinate relief efforts and disseminate critical information (Purohit et al., 2014). The use of mobile phones and other communication technologies has also been shown to enhance emergency response times and improve the effectiveness of disaster management (Morrow, 2011).

2.2.6 Smart city technologies

Smart city technologies are also emerging as a promising solution for enhancing safety and security in urban areas. These technologies include smart traffic management systems, smart lighting systems, and smart emergency response systems. Smart traffic management systems use real-time traffic data to optimize traffic flow, reduce congestion, and improve road safety (Kumar et al., 2017). Smart lighting systems use sensors to detect movement and adjust lighting levels accordingly, improving visibility and reducing the risk of accidents (Kumar et al., 2017). Smart emergency response systems use data from sensors and other sources to optimize emergency response times and improve the effectiveness of emergency services (Kumar et al., 2017).

2.3 Theoretical Framework

The literature already existing on the acceptance of technological advancements and their effectiveness, served as a theoretical foundation for this study. Most safety and security technologies work hand in hand to provide homes with the utmost intrusion protection. When these technologies have been integrated together, they create a smart home infrastructure. According to the existing literature, Smart homes cut out a significant amount of external physical security issues whilst creating their own centralized, social and ethical issues (Fernandes et al., 2016). However, there is limited research on how the use of these individual technologies can reduce security risks and solve safety problems and how they can be integrated to accomplish the same goal residential areas.

The effectiveness of safety and security technologies is also strongly opinionated on how the users will adopt and use the technology. Therefore, the appropriate theoretical framework for this study is the Technology Acceptance Model (TAM). TAM is a well-established model

that explains how users adopt and use technology (Davis, 1989). The TAM has been applied in various studies to investigate the adaptation and use of technology in different contexts, including emerging management (Ofosu-Ampong & Acheampong, 2022) and the acceptance of support systems in 11 African countries inclusive of Zimbabwe (Vreede et al, 1998)

The TAM was most essential and beneficial for this study as it aided the researcher to investigate how prominent technological advancements have been in enhancing the safety and security of the Harare residents of Greencroft. Each individual is accompanied with a strong opinion on the various forms of modern technology and how the use would benefit and disadvantage each homestead and the TAM aids in fully understanding how these views might affect and influence the adaptation of technology use in the neighbourhood

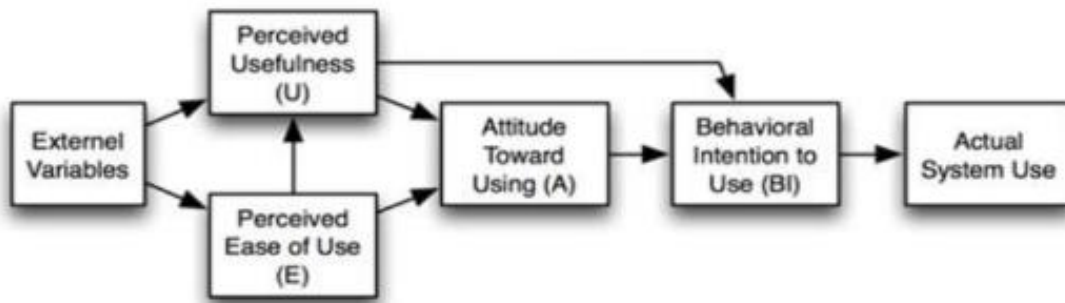
The TAM accompanied with the T-O-E framework was also used to investigate the resident's views on the social and cultural implications on the use of technology in their neighbourhood. The T-O-E framework proposed 3 generic factors of technology adoption which are Technology, organization and Environment. This in turn helps to give better understanding as to how these 3 independent contexts guided and moulded the interviewee's opinions on the adaptation of technology and how its benefits compare to its negative impacts on the society.

Conclusively, other frameworks such as the Unified theory of Acceptance (UTAUT) and the Behavioural intentions model (BI), were used to carry out the study, but the TAM and T-O-E frameworks served as pillars to give the most accurate understanding of how the implementation and use of technology aids in combating safety and security issues in Greencroft as well as how the residents adopted to the idea of using these technologies and the various factors surrounding it.

2.4 Relevance of Theoretical Framework

It is believed that an individual's perspective on something is based off of their thoughts feelings and needs. (Pourtois, 2013) The TAM model argues that technology usage is influenced by users' attitude which is also influenced by perceived usefulness and perceived ease of use.

Figure 2 Technology Acceptance Model



Source: Davis, F. D. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology." *MIS Quarterly*, 13(3), 319-340

The main objective of this study is to analyse how the use of technology can enhance safety and security of the residents of Greencroft. The model is essential to help the researcher gain better understanding on how security and safety technologies are accepted by the Greencroft society given the current crime rates.

Additionally, the study takes a look at the current technologies available to enhance safety and security in the world and how the residents are most likely going to respond to them. The TAM model is essential to analyse the behavioural intention (BI) of the residents to use the technologies. The study investigates how technological systems and devices have evolved in the security and safety sector and the perceived ease of use (E) of this technology has a strong influence on how the residents will respond in regards to wanting to adapt these technologies.

Furthermore, the TAM model is essential to investigate how prominent technological advancements have been in enhancing the safety and security of the Harare residents of Greencroft. The social, economic, environmental and cultural factors in Harare affect how likely citizens are going to respond to technology. The model allows the researcher to derive the appropriate influences that affect the decision making of the respondents. The model will work as a guideline to receive the most effective and accurate results as to how individuals perceive modern-day technology and how useful it has been in past years for those that have already implemented these strategies.

2.5 Summary of Literature Review

The literature review has shown that modern-day technology has the potential to enhance safety and security in Harare. The use of surveillance technologies such as CCTV cameras and facial recognition systems, communication technologies such as mobile phones and social media platforms, and smart city technologies such as smart traffic management systems, smart lighting systems, and smart emergency response systems have all been identified as promising solutions. The Technology Acceptance Model (TAM) will be used as the theoretical framework for this study to investigate the adoption and use of technology in enhancing safety and security in Harare.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter describes the research methodology that will be used to investigate how the use of modern-day technology can enhance safety and solve major security problems in Greencroft Harare. The chapter outlines the research design, population and sampling procedures, data collection, data management, data analysis and ethical considerations.

3.2 Description of the Study Area

The study will be carried out in the Greencroft neighbourhood located in Harare, the capital city of Zimbabwe. The city has a population of approximately 1.6 million people (PopulationStat, 2023) and the Greencroft suburb has approximately 10 235 (Mindat, 2022) people and it faces numerous security challenges, such as, theft robbery and violent crime. The study will question relevant variables such as crime rate, the prevalence of modern-day technology, the capacity of law enforcement agencies, and in turn will mainly focus on the use of modern-day technology as a tool to enhance safety and security in the city as a whole.

3.3 Research Design

The research design used a mixed-methods design, combining both quantitative and qualitative approaches. The overarching research purpose is explanatory, seeking to explore how modern-day technology can enhance safety and solve major security problems in Greencroft Harare. The qualitative strategy that was used is a case study of Greencroft, which is appropriate for this research study because it will allow for an in-depth analysis of the topic of interest. The quantitative approach will involve surveys and statistical analysis to provide numerical data.

3.4 Population and Sampling Procedures

3.4.1 Population of the study

The population of the study is the residents of the Greencroft neighbourhood who are affected by security problems.

3.4.2 Sampling Size

Studies have shown that a smaller sample size can prove to be less accurate but more useful than a much larger one. Whilst a much larger one gives a much more accurate representation of the population size (Choga, 2011). The sample size to be used by a researcher is dependent on a number of variables. Giving reference to (Gray, 1996), the sample size is dependent on factors such as precision, margins of error, nature/characteristics of the population, the type of sampling being used, the purpose of the study, the resources need as well as the timing of the study. Given this information, the sample size needed for a population of 10235 people in Greencroft Harare, assuming a 95% confidence level and a margin of error of 5%:

$$n = (Z^2 * p * q) / E^2$$

Where:

- n = sample size

- Z = z-score corresponding to the desired confidence level (e.g., 1.96 for 95% confidence level)
- p = estimated proportion of the population with a certain characteristic (if unknown, 0.5 is often used as a conservative estimate)
- $q = 1 - p$
- E = desired margin of error (expressed as a proportion, such as 0.05 for 5%)

Assuming a 95% confidence level, a proportion of 0.5, and a margin of error of 0.05, the sample size would be:

$$n = (1.96^2 * 0.5 * 0.5) / 0.05^2 \quad n = \mathbf{384.16}$$

Therefore, a suitable sample size for a population of 10,235 would be around 384 respondents.

Therefore, a sample size of approximately 384 individuals would be required to achieve a margin of error of 5% with a 95% confidence level, assuming a population of 10235 people in Greencroft Harare.

3.5 Study Variables

3.5.1 Independent Variables

- **Age:** This is referring to the length of time a person has existed and this can influence the level of knowledge, the attitude and the measures they take to enhance safety and security of their homes
- **Education:** By definition, this refers to the knowledge received through schooling or instruction and formal education attained can also influence the knowledge, attitudes and practices of people when it comes to the use of technology
- **Religion:** This relates to the belief in something supernatural, be it a God or gods which governs people's morals, how they behave and their practices and this also affects the views on technology and its use as their religion influences their knowledge and attitude
- **Individual Characteristics of bread winners:** This also influences Knowledge, Attitude, and Practices because of individualism.

- **Culture:** This refers to the environment of an individual's upbringing, this in turn also influences their opinion on the use of technology

3.5.2 Dependent Variables

The Dependent Variables in this particular study are the Knowledge, the Attitude and the Practices, which the researcher assessed. These are regarded as the dependent variables as they can be easily influenced by the Independent Variables stated above.

3.6 Data Collection

The data collection method is a combination of primary and secondary data. Primary data was collected through physical surveys and interviews with residents of Greencroft. The none-physical surveys were administrated using an online google form and the physical interviews were conducted face to face. Secondary data was collected through a review of relevant literature, reports and official documents. The questions made up 6 sections of the Questionnaires, with the first part of this questionnaire comprising of questions on demographic characteristics, the questions on the current security challenges being faced in Greencroft making up the second section , the third being about the ways in which modern day technology can be used to solve these problems, the fourth being about how effective the current security measures are, the fifth looking at the most suitable technologies that can be used in Greencroft and finally the sixth being the impact of these technologies in enhancing safety and security in the area.

3.6.1 Validity and Reliability

There was no translation to vernacular language due to the diversity of the neighbourhood, all of the data collection questionnaires were developed in English as it is the neutral language in Zimbabwe and as mentioned prior, this was under the assumption that respondents are literate

3.7 Data Collection Procedure

The researcher is also a resident of the Greencroft neighbourhood which allowed him to go gate to gate as most residents were already of familiarity. Additionally, the research posted online google forms onto the neighbourhood group chat as well as a letter of anonymity and a brief explanation of why the study is being carried out and who the data will be going to. The Google form was disseminated to the group with the aim of targeting all of the homes which fit into the inclusion criteria. The Google form is simple and straightforward and the quality of answers were not greatly compromised if the filling of the forms is unguided.

3.8 Analysis and Organization of Data

3.8.1 Data Management

All of the data collected was stored in a secure electrical database and on a secure web-based database called Heroku. The data was encoded to ensure anonymity and confidentiality of the participants. The data was in turn regularly backed up to prevent loss or corruption of data. The data was also backed-up on a flash-drive and an external hard drive, which was kept under lock-and –key. The data was also be sent to a protected email address for additional back-up.

3.8.2 Data analysis plan

The data that was collected using the Google forms and physical interviews and all of the data collected was then re-entered into Microsoft Excel where cleaning and analysis took place.

3.8.3 Data Analysis

The data analysis will involve both quantitative and qualitative methods. The quantitative data will be analysed using descriptive and inferential statistics, such as mean, standard deviation,

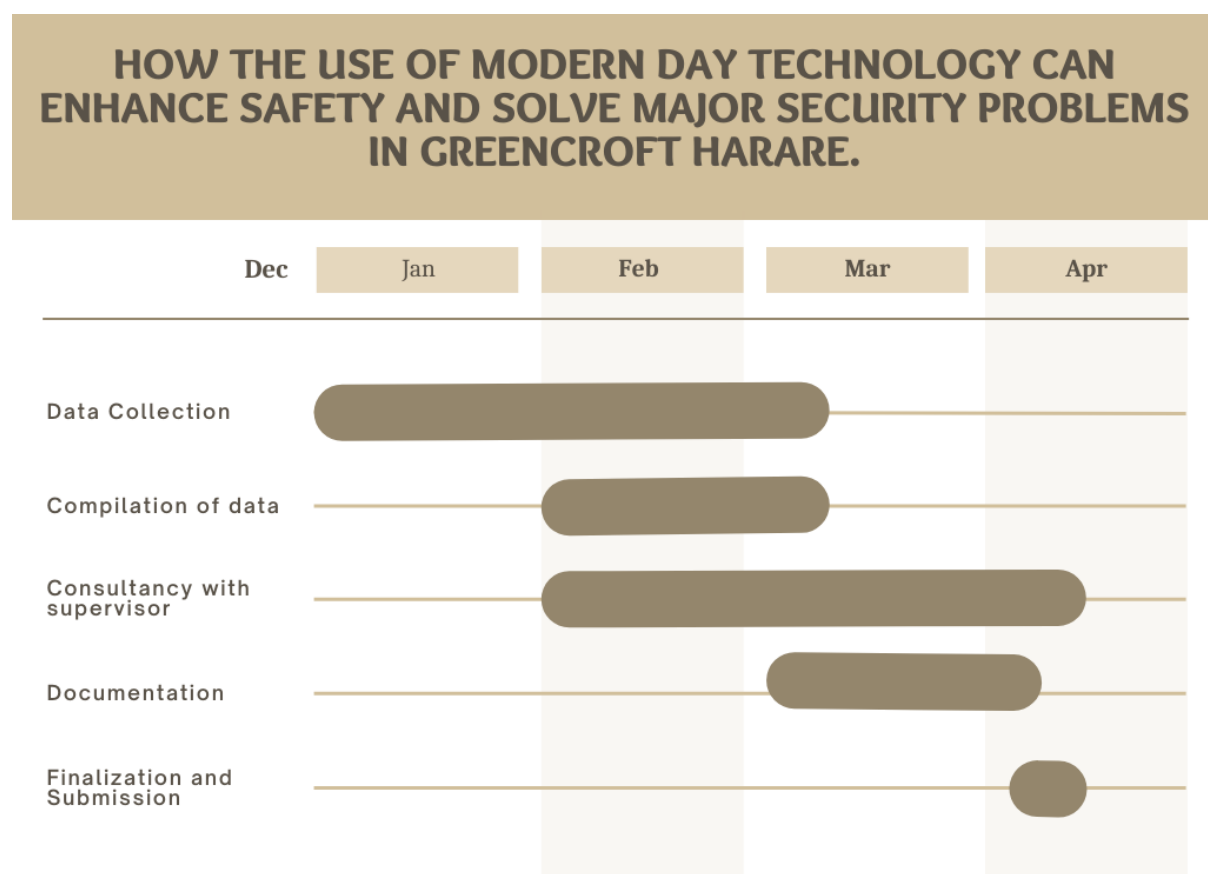
correlation, and regression analysis. The qualitative data will be analysed using content analysis. The results of both analyses will be triangulated to provide a comprehensive understanding of the research question.

3.9 Ethical Considerations

Ethical considerations were adhered to, throughout the study. Informed consent was obtained from all participants and their privacy and confidentiality was protected. The study adhered to local protocols and regulations governing research involving human participants. Any potential risks to the participants were identified and mitigated. The following ethical and moral guidelines were followed throughout the study:

- Only individuals who had given consent filled out the online forms and the data collected from physical interviews came from individuals that were willing to let this information known
- Respondents were to have their actual address and identity kept private even in the case of the data being published
- Any sensitive information retrieved from the respondents was only to be documented in secret and analysed privately
- Respondents had the right to change their mind at any time as these studies were also based on the trust established between the researcher and the respondents during the course of the interview
- Each household was treated equally and no household received special or favoured treatment

3.10 Gantt Chart



3.11 Budget

Activity	Cost
Printing	USD \$12
Transport	USD \$60
Heroku database	USD \$5
Total	USD \$73

CHAPTER 4: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

Chapter 4 presents the findings of this study on the use of modern-day technology in enhancing safety in Greencroft Harare. The objective of this research was to explore how technology can be leveraged to improve safety in Greencroft, with a focus on the perspectives of residents and key stakeholders. In Chapter 1, the research questions and objectives that guided this study were outlined, and in Chapter 3, the researcher described the research methodology that was then used to collect and analyse data.

This chapter begins by providing an overview of the sample characteristics and data analysis techniques used to analyse the data collected through semi-structured interviews and survey questionnaires. The researcher then presents the key findings of the study, organized according to the themes that emerged from the data analysis. Specifically, the researcher highlights the ways in which modern-day technology is currently being used to enhance safety in Harare, as well as the challenges and limitations associated with its use.

Throughout this chapter, he contextualizes the findings within the broader literature on the use of technology for public safety, and discuss the implications of the results for policy and practice. Overall, this chapter offers insights into the potential of modern-day technology to address safety concerns in Greencroft Harare, and provides guidance for stakeholders seeking to optimize the use of these tools for the benefit of the city's residents.

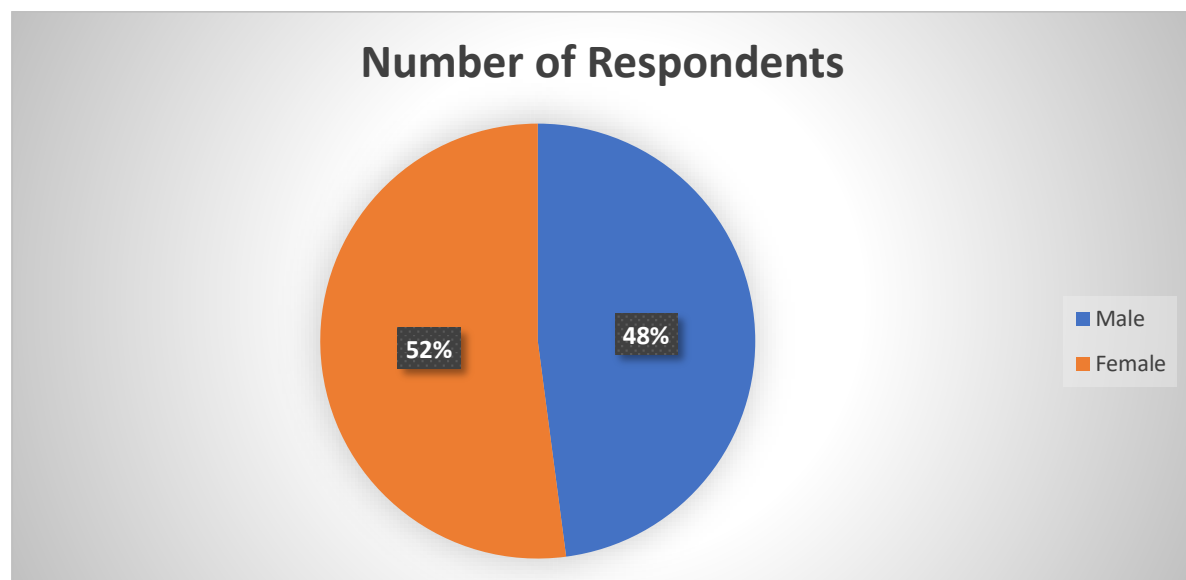
4.2 Data presentation and Analysis

Of the 384 questionnaires that were distributed in Greencroft Harare, 198 were successfully answered and completed. According to (Saunders M. L., 1997), the validity of the research findings is supported by a response rate of at least 50% of the total provided questionnaires.

A 52% response rate was achieved out of the surveys that were issued after 198 of them were completed and returned ensuring the accuracy of the study's findings.

Demographics

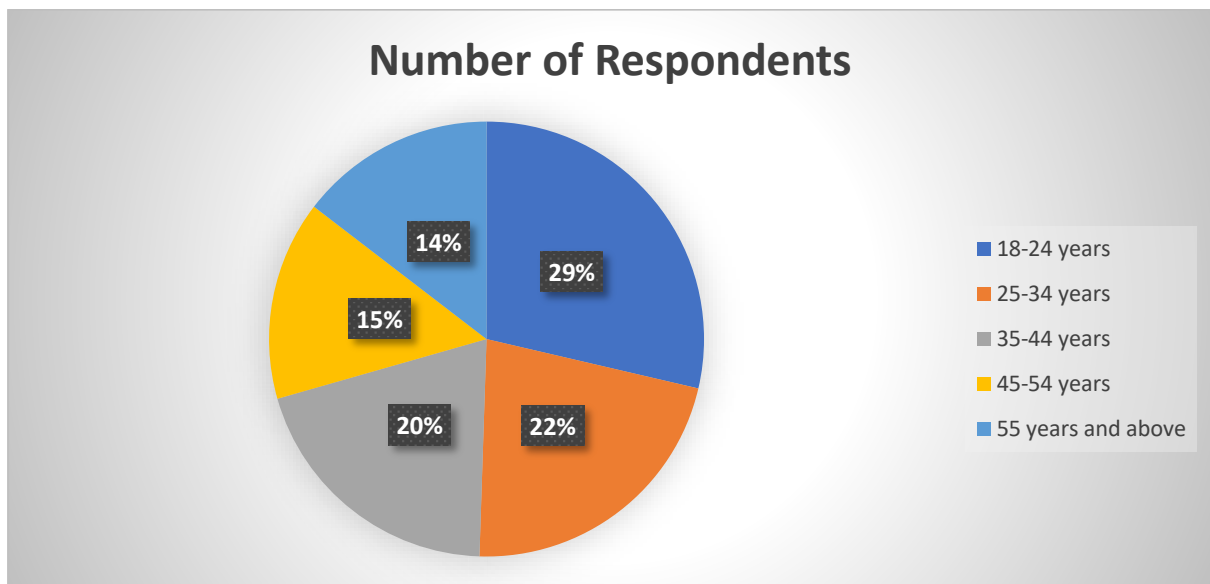
Gender Distribution



According to the pie chart, the majority of respondents (52%) were female, while 48% were male.

Overall, the graph suggests that the study had a relatively balanced distribution of respondents across different gender groups. This distribution may be useful in interpreting the study results and drawing conclusions about the perceptions and attitudes towards modern technology and safety across different gender groups in Greencroft Harare.

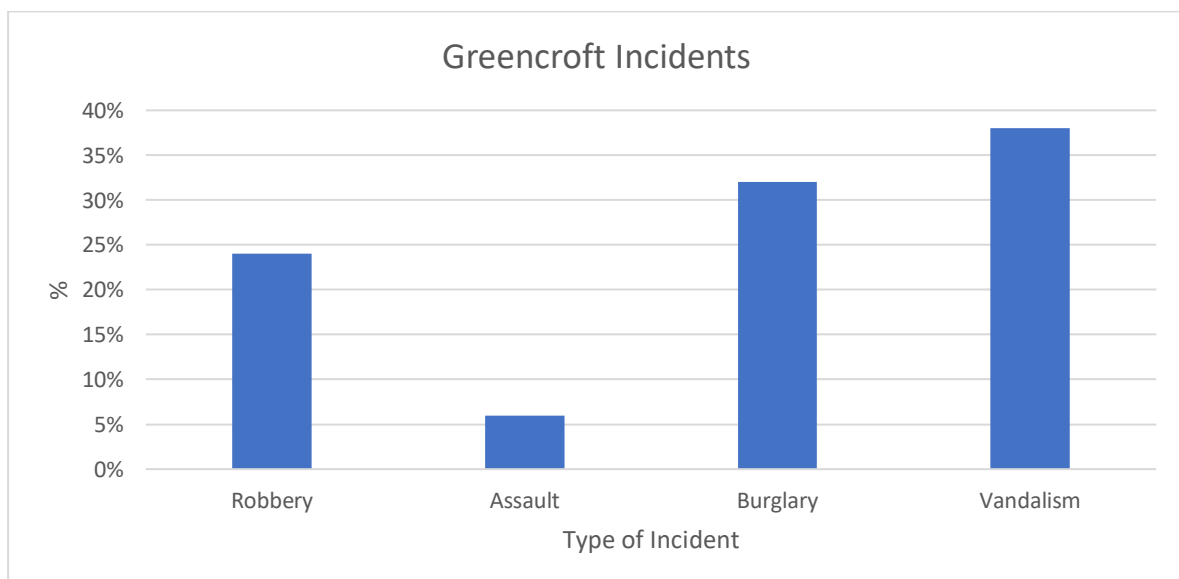
Age Distribution



In the pie chart, we have ages 18-24 with the largest percentage of respondents of 29%, followed by 25-34 years, 20% of 35-44 years, 15% with 45-54 years and 14% of 55 years and above

4.3 Discussion and Interpretation

Current Security Situation in Greencroft Harare



The data presented in the bar graph shows the number and percentage of different types of security incidents reported in a study on the use of modern technology in enhancing safety in Greencroft Harare.

According to the graph, vandalism was the most commonly reported security incident, accounting for (38%) of the total incidents, followed by burglary (32%), robbery (24%), and assault (6%).

Overall, the graph suggests that vandalism and burglary are the most prevalent security incidents in Greencroft Harare, followed by robbery and assault. This information may be useful in developing strategies to address these security challenges and in determining the most effective technological solutions for enhancing safety in Harare.

Potential of Modern Technology in Addressing Security Challenges in Harare

Type of Technology	Level of Impact (High/Medium/Low)	Reasoning
CCTV Cameras	High	Effective in deterring crime and aiding investigations
Access Control Systems	Medium	Effective for controlling access to buildings and facilities
Biometric Authentication	Low	May not be feasible due to cost and infrastructure limitations
Mobile Applications	High	Provide real-time information and emergency alerts

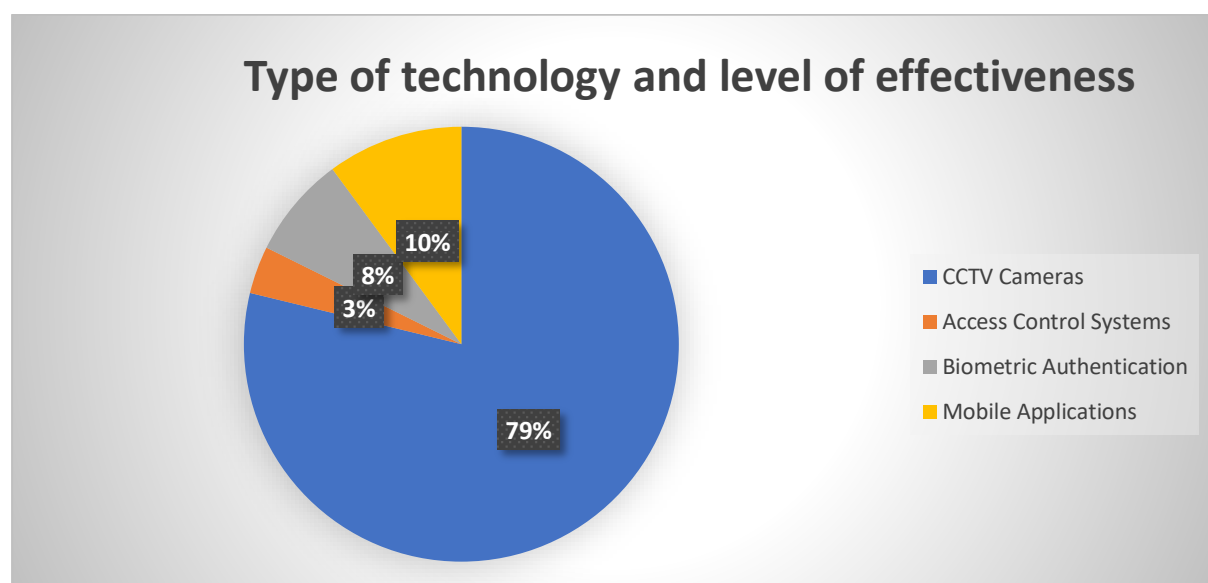
The data presented in the table shows the perceived level of impact of four types of modern technologies (CCTV cameras, Access Control Systems, Biometric Authentication, and Mobile Applications) in enhancing safety and addressing security challenges in Greencroft Harare, along with the reasoning behind each assessment.

Based on the table, CCTV cameras are believed to have a high impact in enhancing safety and addressing security challenges in Greencroft Harare, as they are effective in deterring crime and aiding investigations. Access Control Systems are assessed to have a medium impact as they are effective in controlling access to buildings and facilities, but may not be sufficient on their own to address security challenges in Greencroft Harare.

Biometric Authentication is assessed to have a low impact, as it may not be feasible due to cost and infrastructure limitations in Greencroft Harare. Finally, Mobile Applications are assessed to have a high impact as they can provide real-time information and emergency alerts to the public, which can help to enhance safety and address security challenges in Harare.

Overall, the table suggests that there is potential for modern technologies to be effective in addressing security challenges in Greencroft Harare, but that their impact may vary depending on the specific technology and its feasibility within the context of Harare.

Most Effective Technological Solutions for Enhancing Safety and Addressing Security Challenges in Greencroft Harare

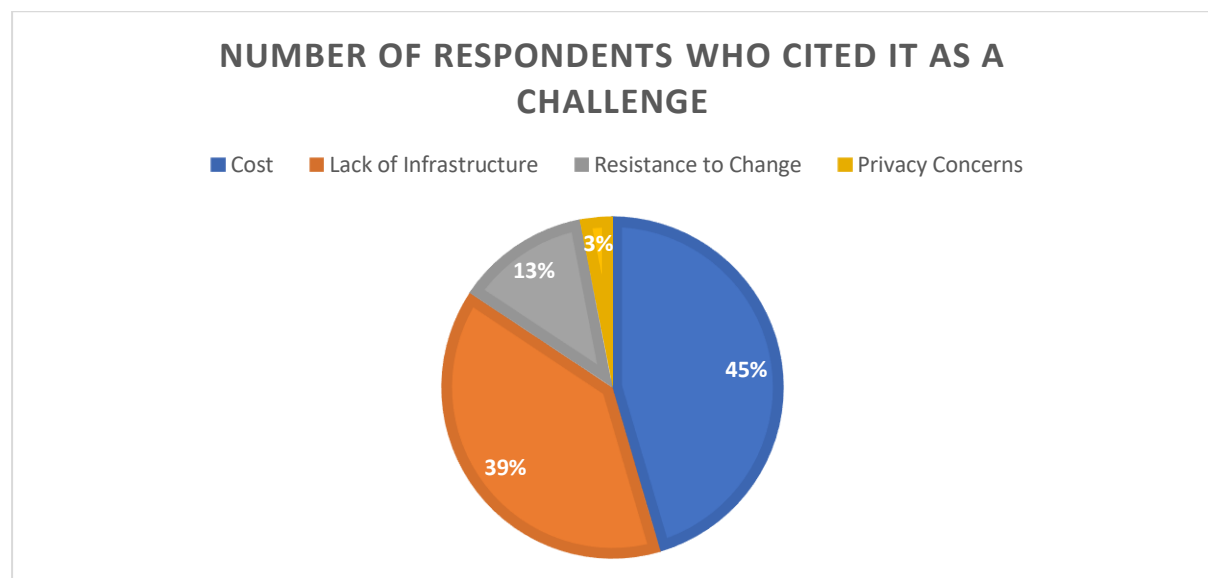


The graph shows the number of respondents and percentage of respondents who consider each type of technology to be most effective for enhancing safety and addressing security challenges in Greencroft Harare.

According to the graph, the majority of respondents (79%) consider CCTV cameras to be the most effective technology for enhancing safety and addressing security challenges in Greencroft Harare. Biometric authentication was the next most effective technology, according to 10% of the respondents, followed by mobile applications, which were considered most effective by 7% of the respondents.

However, only 4% of respondents consider access control systems to be the most effective technology for addressing security challenges in Greencroft, suggesting that this technology may not be widely adopted or effective in the context of Greencroft Harare.

Challenges Associated with Implementing Technological Solutions to Enhance Safety and Address Security Challenges in Greencroft Harare



The data in the above pie chart represents the number of respondents who cited each challenge as a barrier in the use of modern-day technology to enhance safety and solve security problems in Greencroft Harare. The majority of the respondents (45%) identified cost as a significant challenge, followed by lack of infrastructure (39%). Resistance to change was also cited by a significant number of respondents (13%), while privacy concerns were the least cited challenge, with only (3%) respondents citing it. These challenges should be taken into consideration when implementing modern day technology solutions for enhancing safety and security in Greencroft Harare.

Impact of Modern Technology on Enhancing Safety and Addressing Security Challenges in Greencroft Harare.

Type of Technology	Level of Potential (High/Medium/Low)	Reasoning
CCTV Cameras	High	Effective in deterring crime and aiding investigations
Access Control Systems	Medium	Effective for controlling access to buildings and facilities
Biometric Authentication	Low	May not be feasible due to cost and infrastructure limitations
Mobile Applications	High	Provide real-time information and emergency alerts

The data shows the level of potential of different types of technology in enhancing safety and solving security problems. CCTV cameras and mobile applications were rated as having a high potential, with CCTV cameras being effective in deterring crime and aiding investigations, and mobile applications providing real-time information and emergency alerts. Access control systems were rated as having a medium potential and are effective for controlling access to buildings and facilities. Biometric authentication was rated as having a low potential due to cost and infrastructure limitations, which may make it not feasible to implement.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

Chapter 5 serves as the final section of this dissertation, which focuses on exploring how modern-day technology can enhance safety and solve security problems in Greencroft, Harare. In this chapter, a summary of the research findings will be provided, along with conclusions drawn from the study. Additionally, recommendations for the implementation of modern technology to improve safety and security in Greencroft will be presented. The ultimate goal of this chapter is to provide a comprehensive understanding of the role of modern technology in enhancing safety and security in urban areas such as Greencroft, and to offer actionable recommendations for the community, security agencies, and stakeholders.

5.2 Discussion

Assess the current security challenges faced by Greencroft Harare residents:

Based on the research findings, it can be concluded that Greencroft Harare residents face a range of security challenges, including robbery, assault, burglary, and vandalism. These challenges have been reported across all age groups, with vandalism being the most commonly reported security incident. The findings highlight the need for effective security measures to be put in place to address these challenges.

Analyse the potential of modern-day technology in addressing security challenges in Greencroft Harare:

The research findings suggest that modern day technology has a high potential for addressing security challenges in Greencroft Harare. CCTV cameras and mobile applications were found to be particularly effective in enhancing safety and mitigating security threats. However, the

implementation of some modern-day technologies may face challenges such as cost and infrastructure limitations.

Determine the effectiveness of existing security measures in Greencroft Harare:

Based on the research findings, it can be concluded that the effectiveness of existing security measures in Greencroft Harare is limited. Access control systems were found to have a medium impact, but the majority of respondents considered CCTV cameras as the most effective security measure. This suggests that there is a need to reassess existing security measures and implement more effective measures where necessary.

Establish the most suitable modern-day technology to enhance safety and solve security problems in Harare:

The research findings indicate that CCTV cameras and mobile applications are the most suitable modern-day technologies to enhance safety and solve security problems in Greencroft Harare. These technologies have a high potential for mitigating security threats and enhancing safety. However, the implementation of these technologies must be carefully considered in light of cost and infrastructure limitations.

Evaluate the impact of modern-day technology on enhancing safety and solving security problems in Harare:

The research findings suggest that modern day technology has a significant impact on enhancing safety and solving security problems in Greencroft Harare. CCTV cameras and mobile applications were found to have a high impact in mitigating security threats and enhancing safety. The findings highlight the potential benefits of implementing modern day technology in addressing security challenges in Greencroft Harare.

5.3 Conclusion

Based on the research findings and analysis, it can be concluded that the use of modern-day technology has great potential in enhancing safety and solving major security problems in Greencroft, Harare. The study revealed that the current security challenges faced by residents in Greencroft, Harare include burglary, vandalism, robbery, and assault. The most effective modern-day technologies identified for addressing these challenges were CCTV cameras and mobile applications. However, the implementation of these technologies faces challenges such as cost and infrastructure limitations.

The effectiveness of existing security measures in Greencroft, Harare was found to be inadequate, highlighting the need for the adoption of modern-day technologies. The study recommends that stakeholders invest in the implementation of modern-day technologies such as CCTV cameras and mobile applications to enhance safety and security in Greencroft, Harare.

Overall, the study has demonstrated the potential of modern-day technologies in addressing security challenges in urban areas such as Greencroft, Harare. However, the success of implementing these technologies will depend on the collaboration of relevant stakeholders and addressing the identified challenges. Therefore, further research should be conducted to identify and address any other potential challenges that may arise in the implementation of modern-day technologies to enhance safety and security in urban areas.

5.4 Recommendations

- To address the current security challenges faced by Harare residents, it is recommended that the government and local authorities increase investment in community policing programs, improve street lighting, and increase police presence in high-risk areas.
- In order to fully realize the potential of modern-day technology in addressing security challenges in Harare, it is recommended that the government and local authorities invest in more advanced and sophisticated security technology solutions such as biometric authentication systems, artificial intelligence, and video analytics.

- To improve the effectiveness of existing security measures in Harare, it is recommended that regular security audits are conducted to identify weaknesses and gaps in the current security infrastructure. The identified weaknesses should be addressed through investments in advanced security technologies and infrastructure improvements.
- Based on the findings, the most suitable modern-day technology to enhance safety and solve security problems in Harare is CCTV cameras. Therefore, it is recommended that the government and local authorities prioritize investment in CCTV camera systems to improve the city's security.
- In order to evaluate the impact of modern-day technology on enhancing safety and solving security problems in Harare, it is recommended that a pilot study is conducted to evaluate the effectiveness of the implemented security technologies. The results of this pilot study can then be used to guide future investments in security technology solutions.

References

- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Pourtois, G., Schettino, A., & Vuilleumier, P. (2013). Brain mechanisms for emotional influences on perception and attention: What is magic and what is not. *Biological psychology*, 92(3), 492-512.
- Kumar, N., Rathore, M. M., & Paul, A. (2017). Smart city implementation: A review of the literature. *Journal of Cleaner Production*, 164, 397-408.
- Morrow, D. (2011). The use of mobile phones and other communication technologies in emergency response. *Disaster Prevention and Management: An International Journal*, 20(4), 441-445.
- Purohit, H., Hampton, A., & Shalin, V. L. (2014). Using social media to enhance emergency situation awareness. *IEEE Intelligent Systems*, 29(2), 70-77.
- Wang, D., Chen, Y., & Liang, C. (2011). Technology acceptance model for emergency management. *International Journal of Information Management*, 31(4), 308-319.
- Welsh, B. C., & Farrington, D. P. (2009). Effects of closed-circuit television on crime. *Annals of the American Academy of Political and Social Science*, 626(1), 152-166.
- Afolabi, Adeolu Olabode, & Alice, Oke. (2014). On Securing a Door with Finger Print Biometric Technique. *Transactions on Machine Learning and Artificial Intelligence*, 2(2), 86-96.
- Kaur, I., (2010). Microcontroller Based Home Automation System with Security, *International Journal of Advanced computer Science and Applications* 1(6), 60–65.

Kaur, S, Singh, R, Khairwal, N, and Jain P, July 2016, "HOME AUTOMATION AND SECURITY SYSTEM" *Advanced Computational Intelligence: An International Journal (ASCII)*, Vol.3, No.3, pp. 17-23.

Wikipedia contributors. (2022, February 17). Avonlea, Harare. In *Wikipedia, The Free Encyclopedia*. Retrieved 15:40, April 12, 2023, from [https://en.wikipedia.org/w/index.php?title=Avonlea, Harare&oldid=1072434639](https://en.wikipedia.org/w/index.php?title=Avonlea,_Harare&oldid=1072434639)

Çavaş, M., & Ahmad, M. B. (2019). A review advancement of security alarm system using internet of things (IoT). *International Journal of New Computer Architectures and their Applications (IJNCAA)*, 9(2), 38-49.

Fernandes, E., Jung, J., & Prakash, A. (2016, May). Security analysis of emerging smart home applications. In *2016 IEEE symposium on security and privacy (SP)* (pp. 636-654). IEEE.

Ofosu-Ampong, K., & Acheampong, B. (2022). Adoption of contactless technologies for remote work in Ghana post-Covid-19: Insights from technology-organisation-environment framework. *Digital Business*, 2(2), 100023.

Vreede, G. J. D., Jones, N., & Mgaya, R. J. (1998). Exploring the application and acceptance of group support systems in Africa. *Journal of Management Information Systems*, 15(3), 197-234.

Zhu, K., Kraemer, K. L., Gurbaxani, V., & Xu, S. X. (2006). Migration to open-standard interorganizational systems: network effects, switching costs, and path dependency. *Mis Quarterly*, 515-539.

Shah, H. N. M., Ab Rashid, M. Z., Abdollah, M. F., Kamarudin, M. N., Lin, C. K., & Kamis, Z. (2014). Biometric voice recognition in security system. *Indian journal of Science and Technology*, 7(2), 104.

Esper, T. L., Ellinger, A. E., Stank, T. P., Flint, D. J., & Moon, M. (2010). Demand and supply integration: a conceptual framework of value creation through knowledge management. *Journal of the Academy of marketing Science*, 38, 5-18.

Stephens, G. (2003). Global trends in crime. *The Futurist*, 37(3), 41.

APPENDICES

APPENDIX 1: Questionnaire Survey Instrument

Questionnaire for Greencroft Residents

Take not of the following instructions

- 1. Answer all questions**
- 2. Do not indicate your name**

SECTION A: DEMOGRAPHIC QUESTIONS

1. What is your gender?
 - Male
 - Female
2. What is your age range?
 - 18-25
 - 26-35
 - 36-45
 - 46-55
 - 56 and above
3. How long have you lived in Greencroft Harare?
 - Less than 1 year

- 1-5 years
- 6-10 years
- 11-15 years
- More than 15 years

SECTION B: What are the current security challenges faced by residents of Greencroft Harare?

4. In the past year, have you experienced any security-related incidents in your neighbourhood? (Check all that apply)

- Burglary
- Theft
- Vandalism
- Assault
- Other (please specify)

5. How concerned are you about the security situation in your neighbourhood?

- Not at all concerned
- Slightly concerned
- Moderately concerned
- Very concerned
- Extremely concerned

6. Have you taken any measures to improve the security of your property? (Check all that apply)
- Installed security cameras
 - Installed burglar bars
 - Installed a security system (e.g., alarm)
 - Joined a neighbourhood watch program
 - Other (please specify)
7. How effective do you think the local authorities are in addressing security concerns in Greencroft Harare?
- Not effective at all
 - Slightly effective
 - Moderately effective
 - Very effective
 - Extremely effective
8. In your opinion, what are the main causes of the security challenges faced by residents of Greencroft Harare? (Open-ended question)
9. What additional security measures do you think could be implemented to improve the security situation in Greencroft Harare? (Open-ended question)

SECTION C: In what ways can modern technology be used to address security challenges in Greencroft Harare?

1. In your opinion, what are the main security challenges faced by residents of Greencroft Harare? (Open-ended question)
2. How familiar are you with modern technology (e.g., smartphones, security cameras, smart locks, etc.)?
 - Not at all familiar
 - Slightly familiar
 - Moderately familiar
 - Very familiar
 - Extremely familiar
3. Have you used any modern technology to enhance the security of your property in Greencroft Harare? (Check all that apply)
 - Installed security cameras
 - Installed smart locks
 - Installed a security system (e.g., alarm)
 - Used a neighbourhood watch app
 - Other (please specify)

4. In your opinion, how effective is modern technology in addressing security challenges in Greencroft Harare?

- Not effective at all
- Slightly effective
- Moderately effective
- Very effective
- Extremely effective

5. Have you faced any challenges while using modern technology to enhance your security in Greencroft Harare? (Check all that apply)

- Lack of technical knowledge
- Expensive equipment
- Internet connectivity issues
- Privacy concerns
- Other (please specify)

6. What additional modern technologies do you think could be implemented to improve the security situation in Greencroft Harare? (Open-ended question)

SECTION D: How effective are the existing security measures in Greencroft Harare?

1. Have you noticed any security measures in place in your neighbourhood?

(Check all that apply)

- Security guards
- Guard dogs
- Security cameras
- Streetlights
- Fences or walls
- Other (please specify)

2. In your opinion, how effective are the existing security measures in Greencroft Harare?

- Not effective at all
- Slightly effective
- Moderately effective
- Very effective
- Extremely effective

3. Have you ever witnessed any security breaches despite the existing security measures in place? (Check all that apply)

- Burglary
- Theft
- Vandalism
- Assault
- Other (please specify)

4. Do you think the existing security measures are sufficient to address the security challenges faced by residents of Greencroft Harare?

- Yes, they are sufficient
- No, they are not sufficient
- I'm not sure

5. If you think the existing security measures are not sufficient, what additional measures do you think could be implemented to improve the security situation in Greencroft Harare? (Open-ended question)

- How often do you think the existing security measures should be reviewed and updated to ensure they are effective?
- Every month
- Every 3 months
- Every 6 months
- Every year
- Other (please specify)

SECTION E: What modern day technologies are most suitable for enhancing safety and solving security problems in Greencroft Harare?

1.

How familiar are you with modern day technologies that can enhance safety and security? (e.g., smartphones, security cameras, smart locks, etc.)

- Not at all familiar
- Slightly familiar
- Moderately familiar
- Very familiar
- Extremely familiar

2. In your opinion, what modern day technologies are most suitable for enhancing safety and solving security problems in Greencroft Harare? (Check all that apply)

- Security cameras
- Smart locks
- Biometric access control
- GPS tracking
- Panic buttons

- Smart lighting
- Other (please specify)

3. How effective do you think these modern-day technologies are in addressing security challenges in Greencroft Harare?

- Not effective at all
- Slightly effective
- Moderately effective
- Very effective
- Extremely effective

4. Have you used any of these modern-day technologies to enhance your security in Greencroft Harare? (Check all that apply)

- Security cameras
- Smart locks
- Biometric access control
- GPS tracking
- Panic buttons
- Smart lighting
- Other (please specify)

5. If you have used any of these technologies, how effective were they in enhancing your security in Greencroft Harare?

- Not effective at all
- Slightly effective
- Moderately effective
- Very effective
- Extremely effective
- N/A (did not use any of these technologies)

6. What barriers, if any, prevent residents of Greencroft Harare from using modern day technologies to enhance their safety and security? (Open-ended question)

SECTION F: What is the impact of modern-day technology on enhancing safety and solving security problems in Greencroft Harare?

1. Have you noticed any changes in the security situation in Greencroft Harare due to the use of modern-day technologies? (Check all that apply)

- Reduction in crime rate
- Increased sense of security among residents
- Increased efficiency in responding to security threats
- Other (please specify)

2. Have you personally used any modern-day technologies to enhance your safety and security in Greencroft Harare? (Check all that apply)

- Security cameras
- Smart locks
- Biometric access control
- GPS tracking
- Panic buttons
- Smart lighting
- Other (please specify)
- None of the above

3. If you have used any of these technologies, how have they impacted your safety and security in Greencroft Harare? (Open-ended question)
- How important do you think it is for residents of Greencroft Harare to adopt modern day technologies for enhancing their safety and security?
 - Not important at all
 - Slightly important
 - Moderately important
 - Very important
 - Extremely important
4. What challenges, if any, do you think residents of Greencroft Harare face in adopting modern day technologies for enhancing their safety and security? (Open-ended question)

END OF QUESTIONNAIRE THANK YOU FOR YOUR VALUED TIME