ASSESSMENT OF THE USE OF PHYSICAL SECURITY IN COMMERCIAL BUILDING

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CHAPTER ONE

INTRODUCTION

1.1 Background of study

The use of physical security measures in commercial buildings has become a critical component of a comprehensive security strategy (ASIS International, 2019). Commercial buildings, such as office complexes, shopping centers, and industrial facilities, are vulnerable to various security threats, including unauthorized access, theft, vandalism, and violence (FEMA, 2018). The consequences of these threats can be severe, resulting in financial losses, damage to property, and harm to occupants (Insurance Information Institute, 2020, p. 3). In response, building owners and managers are increasingly recognizing the importance of physical security measures in preventing and mitigating these risks (NFPA, 2020).

The concept of physical security has been around for centuries, with the earliest recorded use of physical security measures dating back to ancient civilizations (Purpura, 2019). The use of physical barriers, such as walls and gates, to protect buildings and assets has been a common practice throughout history (Kruegle, 2017). However, it wasn't until the 20th century that physical security became a recognized field of study, with the establishment of the American Society for Industrial Security (ASIS) in 1955 (ASIS International, 2019).

Over the years, physical security measures have evolved to address the changing nature of security threats (Taylor, 2019). The introduction of new technologies, such as access control systems and surveillance cameras, has improved the effectiveness of physical security measures (Kim & Lee, 2018). Additionally, the use of intelligent building technologies, such as smart locks and biometric authentication, has become increasingly popular in commercial buildings (Yin, 2018).

Despite the importance of physical security, there are several challenges facing the implementation of effective physical security measures in commercial buildings (Purpura, 2019). One of the main challenges is the lack of resources, including funding and personnel (Kruegle, 2017). Another challenge is the complexity of modern commercial buildings, which can make it difficult to implement and maintain effective physical security measures (Taylor, 2019).

The current state of physical security in commercial buildings is characterized by a lack of standardization and inconsistency in the implementation of physical security measures (NFPA,

2020). Many commercial buildings lack effective physical security measures, leaving them vulnerable to security threats (ASIS International, 2019). Additionally, the use of technology in commercial buildings has introduced new security risks that must be addressed (Yin, 2018).

1.2 Statement of research problem

The use of physical security measures in commercial buildings is a critical component of a comprehensive security strategy, yet there is a lack of understanding about the effectiveness of these measures in preventing and responding to security threats (ASIS International, 2019). Despite the importance of physical security, many commercial buildings lack effective physical security measures, leaving them vulnerable to security breaches and threats (FEMA, 2018). The consequences of these breaches can be severe, resulting in financial losses, damage to property, and harm to occupants (Insurance Information Institute, 2020).

The lack of effective physical security measures in commercial buildings is a complex problem that is influenced by various factors, including the type of building, the location, and the level of security awareness among occupants and security personnel (Purpura, 2019) Additionally, the increasing use of technology in commercial buildings has introduced new security risks that must be addressed, such as cyber threats and data breaches (Taylor, 2019).There is a significant research gap in the field of physical security in commercial buildings (Purpura, 2019). While there is a large body of research on the use of physical security measures in residential buildings, there is a lack of research on the use of physical security measures in commercial buildings (Kruegle, 2017). Additionally, there is a need for research on the effectiveness of physical security measures in preventing and responding to security threats in commercial buildings (Taylor, 2019).

1.3 Research Questions

This question is formulated to archive the purpose of the study;

1. What are the types of physical security measures implemented in commercial buildings?
2. How is the effectiveness of physical security measures in preventing and responding to security threats in commercial buildings?
3. What are the challenges facing the implementation of effective physical security measures in commercial buildings?

1.4 Aim and Objectives of the study

1.4.1 Aim

The main aim of this study is to assess the use of physical security in commercial building in Nigeria.

1.4.2 Objectives

1. To examine the types of physical security measures implemented in commercial buildings.
2. To identify the effectiveness of physical security measures in preventing and responding to security threats in commercial buildings.
3. To evaluate the challenges facing the implementation of effective physical security measures in commercial buildings.

1.5 Significant of the study

The effectiveness of physical security measures in commercial buildings has been the subject of significant research (ASIS International, 2019). Studies have shown that physical security measures can be effective in preventing and responding to security threats (Purpura, 2019). However, the effectiveness of physical security measures can be influenced by various factors, including the type of measure, the quality of installation and maintenance, and the level of training and awareness among security personnel and occupants (Kruegle, 2017). The effectiveness of physical security measures in commercial buildings has been the subject of significant research (ASIS International, 2019). Studies have shown that physical security measures can be effective in preventing and responding to security threats (Purpura, 2019). However, the effectiveness of physical security measures can be influenced by various factors, including the type of measure, the quality of installation and maintenance, and the level of training and awareness among security personnel and occupants (Kruegle, 2017).

1.6 Scope and limitation of study

The scope of the study will base on commercial building within Kwara state. The scope of this study is to investigate the use of physical security measures in commercial buildings, with a focus on the types of measures implemented, their effectiveness, and the factors that contribute to their success or failure. The study will examine the current state of physical

security in commercial buildings, including the types of measures used, the level of training and awareness among security personnel and occupants.

The study is limited to Kwara state due to time and financial constraint.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Physical security refers to protective measures taken to prevent unauthorized access and to safeguard people, property, and assets from physical threats such as theft, vandalism, or terrorism (Wikipedia, 2023). In commercial buildings, effective physical security is essential to ensure business continuity, reduce liability, and protect critical assets.

2.2 Theoretical Framework

2.2.1 Crime Prevention Through Environmental Design (CPTED)

Crime Prevention Through Environmental Design (CPTED) is a crime prevention strategy that focuses on designing and managing physical environments to reduce the opportunity for crime to occur (Cozen, 2015). The approach is based on the idea that the design and layout of buildings, streets, and public spaces can influence the behavior of individuals and either encourage or discourage criminal activity (Saville & Cleveland, 2017). CPTED is a multidisciplinary approach that combines elements of architecture, urban planning, landscape design, and law enforcement to create safe and secure environments (Steinberg, 2017). CPTED is a multidisciplinary approach that emphasizes the design and management of the built environment to reduce crime opportunities. Key principles include natural surveillance, territorial reinforcement, access control, and maintenance. Implementing CPTED strategies in commercial buildings can deter criminal activities by influencing offender decisions before crimes are committed (Wikipedia, 2025).

2.2.1.1 History and evolution of CPTED

The concept of CPTED has evolved significantly since its introduction in the 1970s, with recent studies highlighting its effectiveness in reducing crime rates (Bruinsma & Johnson, 2018). A study published in 2019 found that CPTED strategies can reduce crime rates by up to 40% (Weisburd et al., 2019). The approach has also been adopted by various countries, including the United States, Canada, and Australia, with each country implementing its own unique CPTED strategies (Saville & Cleveland, 2017).

2.2.1.2 Key Principles of CPTED

CPTED is based on several key principles, including:

1. **Natural Surveillance**: The use of design elements such as windows, lighting, and landscaping to create natural surveillance and visibility (Cozen, 2015).
2. **Access Control**: The use of design elements such as gates, fences, and doors to control access to buildings and public spaces (Steinberg, 2017).
3. **Territorial Reinforcement**: The use of design elements such as signage, landscaping, and lighting to create a sense of ownership and territoriality (Saville & Cleveland, 2017)
4. **Activity Support**: The use of design elements such as benches, lighting, and landscaping to support legitimate activities and discourage loitering (Bruinsma & Johnson, 2018).
5. **Maintenance**: The regular maintenance of buildings and public spaces to prevent deterioration and create a sense of respect and pride (Weisburd et al., 2019).

2.2.1.3 Benefits of CPTED

1. Reduced Crime: CPTED can reduce the risk of crime by creating an environment that discourages criminal activity (Weisburd et al., 2019).
2. Improved Quality of Life: CPTED can improve quality of life by creating safe and secure environments that promote community engagement and social interaction (Saville & Cleveland, 2017).
3. Increased Property Values: CPTED can increase property values by creating attractive and well-maintained environments (Cozen, 2015).
4. Improved Business Operations: CPTED can improve business operations by reducing the risk of crime and improving customer safety (Steinberg, 2017).

2.2.1.4 Challenges and Limitations of CPTED

1. Cost: CPTED can be a costly approach to implement, particularly in existing environments (Bruinsma & Johnson, 2018).
2. Community Engagement: CPTED requires community engagement and participation, which can be challenging to achieve (Saville & Cleveland, 2017).

3. Design and Engineering: CPTED requires expertise in design and engineering, which can be a challenge in resource-constrained environments (Cozen, 2015).
4. Evaluation and Measurement: CPTED can be challenging to evaluate and measure, particularly in terms of its impact on crime rates (Weisburd et al., 2019).

2.2.1.5 Best Practices for Implementing CPTED

1. Conduct a Crime Risk Assessment: Conduct a crime risk assessment to identify areas of high crime risk and prioritize CPTED interventions (Bruinsma & Johnson, 2018).
2. Engage the Community: Engage the community in the CPTED planning and implementation process to ensure that their needs and concerns are addressed (Saville & Cleveland, 2017).
3. Use a Multidisciplinary Approach: Use a multidisciplinary approach that combines expertise in design, engineering, and law enforcement to develop effective CPTED strategies (Cozen, 2015).
4. Monitor and Evaluate: Monitor and evaluate CPTED interventions to ensure that they are effective and make adjustments as necessary (Weisburd et al., 2019).

2.2.1.6 Recent Developments in CPTED

1. Use of Technology: The use of technology such as CCTV cameras, alarms, and motion-sensitive lighting to enhance CPTED strategies (Steinberg, 2017).
2. Sustainable Design: The incorporation of sustainable design principles into CPTED to reduce the environmental impact of buildings and public spaces (Saville & Cleveland, 2017).
3. Community-Led CPTED: The development of community-led CPTED initiatives that empower local communities to take ownership of crime prevention (Bruinsma & Johnson, 2018).
4. Evidence-Based CPTED: The use of evidence-based approaches to CPTED that are grounded in research and evaluation (Weisburd et al., 2019).

2.2.2 Defensible Space Theory

Proposed by Oscar Newman, this theory suggests that architectural and urban design can influence crime rates by creating spaces that residents can control and defend. In

commercial buildings, designing spaces that promote a sense of ownership among occupants can enhance security.

Defensible Space Theory, also known as the Broken Windows Theory, is a concept in urban planning and criminology that suggests that the design and maintenance of a physical environment can influence the behavior of individuals and either encourage or discourage crime (Taylor, 2017). The theory proposes that a well-designed and well-maintained physical environment can create a sense of ownership and responsibility among residents, which in turn can lead to a reduction in crime and an improvement in quality of life (Saville & Cleveland, 2017).

2.2.2.1 History and Evolution of Defensible Space Theory

The concept of Defensible Space Theory was first introduced in the 1960s by urban planner and criminologist Oscar Newman (Newman, 1972). However, in recent years, the theory has undergone significant developments and updates. For example, a study published in 2015 found that Defensible Space Theory can be used to reduce crime in public housing projects (Garcia, 2015). Another study published in 2018 found that Defensible Space Theory can be used to improve community engagement.

2.2.2.2 Key Principles of Defensible Space Theory

1. Natural Surveillance: The use of design elements such as windows, lighting, and landscaping to create natural surveillance and visibility (Saville & Cleveland, 2017).
2. Access Control: The use of design elements such as gates, fences, and doors to control access to buildings and public spaces (Taylor, 2017).
3. Territorial Reinforcement: The use of design elements such as signage, landscaping, and lighting to create a sense of ownership and territoriality (Bruinsma & Johnson, 2018).
4. Maintenance: The regular maintenance of buildings and public spaces to prevent deterioration and create a sense of respect and pride (Garcia, 2015).
5. Activity Support: The use of design elements such as benches, lighting, and landscaping to support legitimate activities and discourage loitering (Saville & Cleveland, 2017).

2.2.2.3 Benefits of Defensible Space Theory

The benefits of Defensible Space Theory include:

1. **Reduced Crime: Defensible Space Theory can reduce the risk of crime by creating an environment that discourages criminal activity (Taylor, 2017).**
2. **Improved Quality of Life: Defensible Space Theory can improve quality of life by creating safe and secure environments that promote community engagement and social interaction (Saville & Cleveland, 2017).**
3. **Increased Property Values: Defensible Space Theory can increase property values by creating attractive and well-maintained environments (Bruinsma & Johnson, 2018).**
4. **Improved Business Operations**: Defensible Space Theory can improve business operations by reducing the risk of crime and improving customer safety (Garcia, 2015).

2.2.2.4 Challenges and Limitations of Defensible Space Theory

While Defensible Space Theory has been shown to be an effective approach to crime prevention, there are several challenges and limitations to its implementation, including:

1. **Cost**: Defensible Space Theory can be a costly approach to implement, particularly in existing environments (Saville & Cleveland, 2017).
2. **Community Engagement**: Defensible Space Theory requires community engagement and participation, which can be challenging to achieve (Bruinsma & Johnson, 2018).
3. **Design and Engineering**: Defensible Space Theory requires expertise in design and engineering, which can be a challenge in resource-constrained environments (Taylor, 2017).
4. **Evaluation and Measurement**: Defensible Space Theory can be challenging to evaluate and measure, particularly in terms of its impact on crime rates (Garcia, 2015).

2.2.2 5 Best Practices for Implementing Defensible Space Theory

To implement Defensible Space Theory effectively, the following best practices should be followed:

1. **Conduct a Crime Risk Assessment**: Conduct a crime risk assessment to identify areas of high crime risk and prioritize Defensible Space Theory interventions (Taylor, 2017).
2. **Engage the Community**: Engage the community in the Defensible Space Theory planning and implementation process to ensure that their needs and concerns are addressed (Saville & Cleveland, 2017).
3. **Use a Multidisciplinary Approach**: Use a multidisciplinary approach that combines expertise in design, engineering, and law enforcement to develop effective Defensible Space Theory strategies (Bruinsma & Johnson, 2018).
4. **Monitor and Evaluate**: Monitor and evaluate Defensible Space Theory interventions to ensure that they are effective and make adjustments as necessary (Garcia, 2015).

2.2.2.6 Recent Developments in Defensible Space Theory

1. Use of Technology: The use of technology such as CCTV cameras, alarms, and motion-sensitive lighting to enhance Defensible Space Theory strategies (Saville & Cleveland, 2017).
2. Sustainable Design: The incorporation of sustainable design principles into Defensible Space Theory to reduce the environmental impact of buildings and public spaces (Bruinsma & Johnson, 2018).
3. Community-Led Defensible Space Theory: The development of community-led Defensible Space Theory initiatives that empower local communities to take ownership of crime prevention (Taylor, 2017).
4. Evidence-Based Defensible Space Theory: The use of evidence-based approaches to Defensible Space Theory that are grounded in research and evaluation (Garcia, 2015)

2.3 Types of Physical Security Measures

Physical security measures are essential for protecting people, assets, and infrastructure from various threats, including unauthorized access, theft, vandalism, and terrorism (Garcia, 2015). The goal of physical security is to prevent or minimize the risk of security breaches by implementing various measures that deter, detect, and respond to potential threats (ASIS International, 2017). There are several types of physical security measures that can be implemented to achieve this goal, including:

2.3.1 Access Control Measures

Access control measures are designed to regulate who can enter or exit a secure area, such as a building, room, or perimeter (Kovacich, 2016). These measures include:

- Locks and Keys: Mechanical or electronic locks that require a key or combination to gain access (Garcia, 2015).
- Card Readers: Electronic card readers that require a valid card or credential to gain access (ASIS International, 2017).
- Biometric Authentication: Biometric authentication systems, such as facial recognition or fingerprint scanners, that verify an individual's identity (Kovacich, 2016).

2.3.2 Surveillance Measures

Surveillance measures are designed to monitor and detect potential security threats, such as unauthorized access or suspicious activity (Taylor, 2018). These measures include:

- **CCTV Cameras**: Closed-circuit television (CCTV) cameras that provide real-time video surveillance (Garcia, 2015).
- **Motion Detectors**: Motion detectors that detect movement and trigger an alarm or alert (ASIS International, 2017).
- **Alarm Systems**: Alarm systems that sound an alarm or send a notification when a security breach is detected (Kovacich, 2016).

2.3.3 Perimeter Security Measures

Perimeter security measures are designed to protect the outer boundary of a secure area, such as a fence or wall (Taylor, 2018). These measures include:

- **Fences and Walls**: Physical barriers, such as fences or walls, that prevent unauthorized access (Garcia, 2015).
- **Gates and Gatehouses**: Controlled access points, such as gates or gatehouses, that regulate entry and exit (ASIS International, 2017).
- **Bollards and Barriers**: Physical barriers, such as bollards or barriers, that prevent vehicle access (Kovacich, 2016).

2.3.4 Lighting and Illumination Measures

Lighting and illumination measures are designed to enhance visibility and deter potential security threats, such as crime or vandalism (Taylor, 2018). These measures include:

- Outdoor Lighting: Outdoor lighting, such as streetlights or floodlights, that illuminates the perimeter and surrounding areas (Garcia, 2015).
- Interior Lighting: Interior lighting, such as ceiling lights or table lamps, that illuminates the Interior of a building or room (ASIS International, 2017).
- Emergency Lighting: Emergency lighting, such as exit signs or emergency lights, that provides illumination during power outages or emergencies (Kovacich, 2016).

2.3.5 Intrusion Detection Measures

Intrusion detection measures are designed to detect and respond to potential security breaches, such as unauthorized access or tampering (Taylor, 2018). These measures include:

- Intrusion Detection Systems: Intrusion detection systems, such as door and window sensors, that detect and alert security personnel to potential breaches (Garcia, 2015).
- Motion Detectors: Motion detectors that detect movement and trigger an alarm or alert (ASIS International, 2017).
- Pressure Pads: Pressure pads that detect weight or pressure and trigger an alarm or alert (Kovacich, 2016).

2.3.6 Benefits of Physical Security Measures

- Reduced Risk: Reduced risk of security breaches, such as unauthorized access or theft (Garcia, 2015).
- Improved Safety: Improved safety and security for people, assets, and infrastructure (ASIS International, 2017).
- Increased Confidence: Increased confidence and trust in the security of a facility or organization (Kovacich, 2016).
- Regulatory Compliance: Compliance with regulatory requirements and industry standards (Taylor, 2018).

2.4 Empirical Studies on Physical Security in Nigerian Commercial Buildings

2.4.1 Efficacy of CCTV in Lagos Metropolis

A study by Olatunji et al. (2025) assessed the effectiveness of CCTV systems in managing security in commercial properties in Lagos. Findings indicated that theft was the most prevalent crime, accounting for approximately 45.4% of incidents. CCTV footage provided substantial evidence in about 60.37% of cases in shopping malls, highlighting its role in crime detection and deterrence.

2.4.2 Passive Design Features in Abuja Shopping Centers

Research on large shopping centers in Abuja revealed that integrating passive design features, such as strategic placement of entrances and open spaces, enhanced the effectiveness of active security installations. The study emphasized the need for collaborative planning between architects and security experts to optimize building security (Sowemimo et al., 2025).

2.4.3 Cost Implications of Security Measures in Abuja and Minna

An analysis compared the costs of built-in security components in commercial buildings across Abuja and Minna. Results showed significant cost variations based on building location and design complexity. Buildings in Abuja, often more complex in design, incurred higher security costs than simpler structures in Minna (Ogunruku et al., 2025).

2.5 Technological Advancements in Building Security

2.5.1 RFID-Based Access Control Systems

The implementation of Radio Frequency Identification (RFID) technology in access control systems has enhanced security in commercial buildings. RFID systems allow for efficient monitoring of personnel movement and restrict unauthorized access, contributing to a sustainable security architecture (Basscomm Nigeria, 2024).

2.5.2 Multi-Sensor Intrusion Detection Systems

Recent developments have introduced intrusion detection systems that combine various sensors, such as Passive Infrared (PIR) sensors and magnetic switches, to detect unauthorized entries. These systems provide real-time alerts to property owners, enabling swift responses to security breaches (Leadership Newspapers, 2023).

2.6 Challenges Facing the Implementation of Effective Physical Security Measures in Commercial Buildings.

Commercial buildings are vulnerable to various security threats, including unauthorized access, theft, vandalism, and terrorism (Garcia, 2015). The implementation of effective physical security measures is crucial to mitigate these risks and ensure the safety of occupants, assets, and property (Saville & Cleveland, 2017). However, several challenges hinder the implementation of effective physical security measures in commercial buildings.

2.6.1 Lack of Awareness and Understanding of Security Risks

One of the primary challenges facing the implementation of effective physical security measures in commercial buildings is the lack of awareness and understanding of security risks (Taylor, 2017). Many building owners, managers, and occupants are unaware of the potential security threats and the importance of implementing effective physical security measures (Bruinsma & Johnson, 2018). This lack of awareness and understanding can lead to inadequate security measures, making commercial buildings vulnerable to security breaches (Garcia, 2015).

2.6.2 Insufficient Funding and Resources

Another challenge facing the implementation of effective physical security measures in commercial buildings is insufficient funding and resources (Saville & Cleveland, 2017). Implementing effective physical security measures can be costly, and many building owners and managers may not have the necessary funds to invest in security measures (Taylor, 2017). Additionally, the lack of resources, such as trained security personnel and equipment, can hinder the implementation of effective physical security measures (Bruinsma & Johnson, 2018).

2.6.3 Complexity of Commercial Building Design

The complexity of commercial building design can also pose a challenge to the implementation of effective physical security measures (Garcia, 2015). Commercial buildings often have multiple entrances, exits, and access points, making it difficult to implement effective security measures (Saville & Cleveland, 2017). Additionally, the use of glass and other materials in building design can create vulnerabilities that can be exploited by potential security threats (Taylor, 2017).

2.6.4 Balancing Security with Aesthetics and Functionality

Commercial buildings must balance security with aesthetics and functionality (Bruinsma & Johnson, 2018). Implementing effective physical security measures can sometimes compromise the aesthetic appeal of a building or hinder its functionality (Garcia, 2015). For example, the installation of security cameras and alarms can be unsightly, while access control measures can restrict the flow of people and goods (Saville & Cleveland, 2017).

2.6.5 Aging Infrastructure and Legacy Systems

Many commercial buildings have aging infrastructure and legacy systems that can pose a challenge to the implementation of effective physical security measures (Taylor, 2017). Older buildings may have outdated security systems, electrical infrastructure, and other systems that can create vulnerabilities and make it difficult to implement modern security measures (Bruinsma & Johnson, 2018).

2.6.6 Cybersecurity Threats

Commercial buildings are also vulnerable to cybersecurity threats, which can compromise the security of physical security systems (Garcia, 2015). Cybersecurity threats, such as hacking and malware, can disable security cameras, alarms, and access control systems, making it easier for potential security threats to breach a building's security (Saville & Cleveland, 2017).

2.6.7 Compliance with Regulations and Standards

Commercial buildings must comply with various regulations and standards related to physical security (Taylor, 2017). Compliance with these regulations and standards can be challenging, particularly for building owners and managers who may not be familiar with the requirements (Bruinsma & Johnson, 2018).

2.6.8 Training and Education of Security Personnel

The training and education of security personnel is crucial to the implementation of effective physical security measures in commercial buildings (Garcia, 2015). However, many security personnel may not receive adequate training and education, which can compromise the security of a building (Saville & Cleveland, 2017).

2.6.9 Maintenance and Upkeep of Security Systems

The maintenance and upkeep of security systems is essential to ensure their effectiveness (Taylor, 2017). However, many commercial buildings neglect to maintain and upkeep their security systems, which can lead to equipment failure and security breaches (Bruinsma & Johnson, 2018).

2.6.10 Integration with Other Security Measures

Finally, the integration of physical security measures with other security measures, such as cybersecurity and emergency response planning, is crucial to ensure the overall security of a commercial building (Garcia, 2015). However, many commercial buildings may not integrate their physical security measures with other security measures, which can create vulnerabilities and compromise the security of the building (Saville & Cleveland, 2017).

2.7 Summary of Literature Review

The reviewed literature underscores the importance of integrating both passive and active security measures in commercial buildings. While technological advancements offer enhanced security solutions, challenges such as cost and maintenance persist. Collaborative efforts between architects, security experts, and facility managers are crucial for developing effective security strategy.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter will discuss the approach by which this study will be under taken. It details, the method chosen for selecting the sample size, sources of data used and how information will be collected from these sources. It also describes how questionnaires designed will be distributed and how information gathered will be analyzed and presented for discussions and deductions.

3.1 Research Methodology

Data for the study will be collected through structured questionnaire which was administered to construction professionals and contractors. The construction professionals include architects, builders, civil Engineers, MEP Engineers and quantity surveyors. Interviews were also conducted to get more information from contractors to further substantiate the details of the responses in the questionnaires. in Osun state, Nigeria. The study area was restricted to Kwara state due to the highest concentration of construction activities. One hundred (100) copies of questionnaire will be purposively administered to construction professionals and contractors that were directly involved at design and construction activities in the study area. Purposive sampling technique was used and the questionnaire was analyzed using frequencies, percentages and relative index.

3.2 Method of Data Collection

In this study, the use of administered questionnaires method was applicable through. This was found to be appropriate for this study because the survey of respondents namely, construction professionals include architects, builders, civil engineers and quantity surveyors and Interviews in the study area. Questionnaires will be use in this study. Questionnaires were self - administered to the construction professionals include architects, builders, civil engineers and quantity surveyors in Kwara state. And interviews towards resolving the research questions, attaining the aim and objectives with the primary purpose of generating reliable data. The questionnaires complimented with interviews assured uniformity and large numbers of respondents were covered within the limited time at the disposal of the researcher.

3.3 Sources of Data

Primary source of information was used for this research. Primary data used in this research were gathered from the household survey, primary informant interviews, and field observations. In this research, the main means of gathering information were structured questionnaire, field measurement, face-to-face interviews and private observation. The organized household survey questionnaire involves close ended questions. The questionnaire given in English Language and translated whenever there is need to Yoruba language. The investigator monitored the household study.

3.4 Sampling and Sampling Techniques

Both probability and non-probability techniques of sampling were used in the research. Simple random methods were used to define the participants from among the probability sampling. In simple random sampling of a specified size, an equal selection probability is provided to all members of a frame. The purposeful sampling technique was used to select the study region from the non-probability sampling method. Ilorin therefore purposely chosen because it is the capital where there is a greater concentration of the population and where recreational and high commercial building regions are situated than other regions of the state.

3.5 Method of Data Analysis of Data Obtained Via Survey Method

Method of Data and Analysis of Data comprises the total number of population elements of sample units that are selected for investigation in a research study, Method of Data analysis are the systematic organization of the raw data into a meaningful pattern, which involves inspecting, sorting, transforming and displaying the data (Babbie, 2007). Since the research involves the concept of a single approach which is the questionnaire, the method of data analyses included: Relative Important Index (RII) and Mean Item Score (MIS) ranking.

$$RII = \frac{\sum XiYi}{\sum Xi} \quad \text{.....equation 1}$$

Where: $RII = Relative\ Importance\ Index$

$\sum = Summation\ Notation$

$Xi = Number\ of\ Response$

$Yi = Value\ of\ Rating$

$$MIS = \frac{\sum fx}{\sum f} \quad \text{.....equation2}$$

Where: $MIS = Mean\ of\ Item\ Score$

$\sum = Summation\ Notation$

$x = Number\ of\ Response$

$y = Value\ of\ Rating$

CHAPTER FOUR

4.0 Data Presentation and Analyses

Data for the assessment of the use of physical security in commercial building were obtained upon administering a total number of 40 questionnaires, out of which 38 appropriately completed and reverted questionnaires were carefully chosen, statistically explored and presented in line with the research questions that steered the study.

4.1 Demographic Survey

4.1.1 Sex

Twenty-nine participants representing 76.32% being the maximum percentage was obtained for male while 9 participants representing 23.68% was recorded for female participants was recorded for the study.

Table 4.1 depicts the percentage distribution of participants according to sex.

S/N	Sex	Frequency	Percentage
1	Male	29	76.32
2	Female	9	23.68
	Total	38	100

4.1.2 Professionalism

In terms of professionalism, 20, 5,5,5,0 and 3 respondents representing 52.63%, 13.16%, 13.16%, 13.16%, 0.00 and 7.89% were obtained for Quantity Surveyors, Architects, Builders, Civil Engineers, Project Managers and others (Janitors). Cumulatively, 100% of the study population emanated from construction industry professionals.

Table 4.2 depicts the percentage distribution of participants according to profession

S/N	Profession	Frequency	Percentage
1	Quantity surveying	20	52.63
2	Architecture	5	13.16
3	Builder	5	13.16
4	Civil engineer	5	13.16
5	Project manager	0	0.00
6	Others	3	7.89
	Total	38	100

4.1.3 Extent of Work Experience

The extent of work experience was categorized into less than 1 year, 1 – 3 years, 3 – 5 years, 5 – 7 years, 7 – 10 years and 10 years and above. Most of the participants from the study area fall in the fifth category, which is, 7-10 years with 13 participants; representing 34.21 of the study population.

Table 4.3: Distribution of Participants according to Extent of Work Experience

S/N	Extent	Frequency	Percentage
1	Below 1 year	4	10.53
2	1-3 years	7	18.42
3	3-5 years	2	5.26
4	5-7 years	5	13.16
5	7-10 years	13	34.21
6	10 years above	7	18.42
	Total	38	100

4.1.4 Academic Qualification

Participants' educational qualifications were categorized in to NCE, OND, HND, PGD, BSc/B. Tech,

MSc/M. Tech and PhD. 0 participants, equivalent to 0.00% of the study population had NCE certificates; 1 participants, equivalent to 2.64% of the study population had OND certificates; 15participants, equivalent to 39.47%, of the study population had HND certificates; 2 participants, equivalent to 5.26% of the study population had PGD certificates; 18 participants, equivalent to 47.37% of the study population had BSc/B. Tech certificates; 2 participants, equivalent to 5.26% of the study population had MSc/M. Tech certificates and 0 participants, equivalent to 0% of the study population had PhD certificates. Based on the academic qualification of study participants, it has become more than apparent that the study instrument is clearly understood.

Table 4.4: Distribution of Participants according to Academic Qualification

S/N	Qualification	Frequency	Percentage
1	NCE	0	0
2	OND	1	2.64
3	HND	15	39.47
4	PGD	2	5.26
5	BSC./M.TECH	18	47.37
6	MSC/M.TECH	2	5.26
7	PHD	0	0
	Total	38	100

4.1.5 Professional Qualification

A total number of 19, 5, 3, 2, 1 and 8 participants equivalent to 50%, 13.16%, 7.89%, 5.26%, 2.64% and 21.05 of the study population were recorded for participants' professional 25 qualification that cut across Nigeria Institute of Quantity Surveyors (NIQS), Nigeria Institute of Building (NIOB), Nigeria Institute of Architects (NIA), Council for the Regulation of

Engineering in Nigeria (COREN), Council of Registered Builders of Nigeria (CORBON) and others (non-registered personnel) respectively.

Table 4.5: Distribution of Participants according to Professional Qualification

S/N	Qualification	Frequency	Percentage
1	NIQS	19	50
2	NIOB	5	13.16
3	NIA	3	7.89
4	COREN	2	5.26
5	CORBORN	1	2.64
6	OTHERS	8	21.05
	Total	38	100

4.1.6 Type of Construction Firm/Organization

Most of the participants emanated from the public sector of the construction industry; having had 23 participants, representing 60.53% of the study population. On the other hand, 15 (39.47%) participants were recorded from the private sector of the industry.

Table 4.6: Distribution of Participants according to Type of Construction Firm/Organization

S/N	Types	Frequency	Percentage
1	Public	23	60.53
2	Private	15	39.47
3	Others	0	0
	Total	38	100

4.1.7 Type of Construction Arrangement

Type of construction arrangement was categorized into traditional, management, design and build, construction management and others (general contractors). 5 (13.16%); 4(10.53%); 11(28.94%); 18(47.37%) and 0(0%) participants were respectively recorded for the listed categories.

Table 4.7: Distribution of Participants according to Type of Construction Arrangement

S/N	Types	frequency	percentage
1	Traditional	5	13.16
2	Management	4	10.53
3	Design and build	11	28.94
4	Construction	18	47.37
5	Others	0	0
	Total	38	100

4.1.8 Project Type

The project type aspect of the demographic survey for the reviewing the globalization of construction industry on sustainable practice in kwara state into housing, civil, industrial and others. 25 participants representing 65.79%; 9 participants representing 23.68%; 1 participant representing 2.64% and 3 participants representing 7.89% of the study population were recorded for housing, civil, industrial and others (maintenance) respectively.

Table 4.8 depicts the percentage distribution of participants according to project type

S/N	Type (s)	frequency	percentage
1	Housing	25	65.79
2	Civil	9	23.68
3	Industrial	1	2.64
4	Other	3	7.89
	Total	38	100

4.2 Identification of types of physical security measures implemented in commercial buildings

Table 4.3 depict the RII and rank distribution on the identification of types of physical security measures implemented in commercial buildings. 0.642, 0.626, 0.642, 0.642, and 0.732 with ranking of 2, 3, 2, 2, and 1 were obtained types of physical security measures implemented in commercial buildings with Intrusion Detection Measures being the 1st rank, Access control measure, Perimeter Security Measures and Lighting and Illumination Measures being the 2nd rand while Surveillance measure being the 3rd rank. Cumulatively, the result capture all the questionnaire dully filled and returned by the participant.

S/N	TYPES	SA	A	N	D	SD	TOTAL	RII	RANKING
1	Access control measure	35	44	27	10	6	122	0.642	2
2	Surveillance measure	30	44	27	12	6	119	0.626	3
3	Perimeter Security Measures	50	24	27	16	5	122	0.642	2
4	Lighting and Illumination Measures	50	28	24	14	6	122	0.642	2
5	Intrusion Detection Measures	75	32	18	10	4	139	0.732	1

4.3 Identification of the challenges facing the implementation of effective physical security measures in commercial buildings

Table 4.4 depict the RII and ranking distribution on the challenges facing the implementation of effective physical security measures in commercial buildings.0.752, 0.700, 0.752, 0.705, 0.758 with raking of 2, 4, 2, 3, and 1 were obtained. Aging Infrastructure and Legacy Systems being the 1st rank, Lack of Awareness and Understanding of Security Risks Complexity of Commercial Building Design being the 2nd rank, Balancing Security with Aesthetics and Functionality being the 3rd rand and Insufficient Funding and Resources being the 4th rank.

S/N	CHALLENGES	SA	A	N	D	SD	TOTAL	RII	RANKING
1	Lack of Awareness and Understanding of Security Risks	60	52	21	8	2	143	0.752	2
2	Insufficient Funding and Resources	35	60	27	8	3	133	0.700	4
3	Complexity of Commercial Building Design	65	52	18	4	4	143	0.752	2
4	Balancing Security with Aesthetics and Functionality	40	44	42	6	2	134	0.705	3
5	Aging Infrastructure and Legacy Systems	65	52	21	2	4	144	0.758	1

4.5 Identification of the level effectiveness of physical security measures in preventing and responding to security threats in commercial buildings

The table below show the level effectiveness of physical security measures in preventing and responding to security threats in commercial buildings with **Effective** being the most occurrence frequency holding 47.37%.

Table 4.5 showing the level of awareness of sustainable practice among professionals

S/N	Level	frequency	percentage
1	Strongly effective	9	23.68
2	Effective	18	47.37
3	Neutral	8	21.05
4	Not effective	3	7.89
5	Strongly not effective	0	0
	Total	38	100

4.6 Discussion of findings

The technique employed in exploring the data obtained was aimed at instituting relative important index of assessing the use of physical security in commercial. The two (2) stage employ during analysis are: calculation of Relative importance index and ranking of each element base on relative importance index.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study assesses the use of physical security in commercial building. The use of physical security measures in commercial buildings has become a critical component of a comprehensive security strategy.

Commercial buildings, such as office complexes, shopping centers, and industrial facilities, are vulnerable to various security threats, including unauthorized access, theft, vandalism, and violence. The consequences of these threats can be severe, resulting in financial losses, damage to property, and harm to occupants.

Meanwhile, Despite the importance of physical security, there are several challenges facing the implementation of effective physical security measures in commercial buildings. One of the main challenges is the lack of resources, including funding and personnel. Another challenge is the complexity of modern commercial buildings, which can make it difficult to implement and maintain effective physical security measures.

5.2 Recommendation

Having concluded the study on the assessment of use of physical security in commercial building in Kwara state, the following recommendation were made:

1. Awareness should be made to client on the important of use of physical security in commercial building.
2. Client should be appropriately advice on the future important use of physical security in commercial building (low cost of maintenance)
3. Professional should make more research and employ expertise with knowledge of advanced security system