INTEGRATION OF PHYSICAL SECURITY ELEMENTS IN PROJECT
DEVELOPMENT MODEL IN MALAYSIA

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A project report submitted in partial fulfilment of the
requirements for the award of the degree of
Master of Engineering (Construction Management)

School of Civil Engineering
Faculty of Engineering
Universiti Teknologi Malaysia

FEBRUARY 2021

DEDICATION

Especially for

My lovely husband and parents,
who gave me endless love, trust, constant encouragement over the years, and for
their prayers. over the years, and for their prayers.

My Family,
for their patience, support, love, and for enduring the ups and downs during the
completion of this thesis.

Supervisor, Course mate, Friends,
for your encouragement throughout the course.

You know who you are.

This thesis is dedicated to them.

ACKNOWLEDGEMENT

I wish to xpress my deepest appreciation to all those who helped me, in one way or another, to complete this project. First and foremost, I thank God Almighty who provided me with strength, direction and purpose throughout the research.

Special thanks to my supervisor, Ts. Dr. Hafiza binti Abas for her precious time and patience, guidance, motivation, selfless support, during the execution of this project. Through her expert guidance, I was able to overcome all the obstacle that I encountered in my research. In fact, she always gave me immense hope every time I consulted with her over problems relating to my research.

Special thank you to my dearest course mates, friend and family who support me so much during my study. Their endless and selfless encouragement motivates me through the hard time.

ABSTRACT

The issues triggered by the failure of protection by physical security are contributing to many problems to assets in the property. People, infrastructure, and information are experiencing major threats from this situation. Requirements for successful physical security in a property or a building are listed as the perimeter and fences, gates and their management, watchtowers, access control system, surveillance system, manpower management, control room, and its management, patrolling, protective lighting, and fire alarm system. This research is done to identify and analyse the physical security issues that arise in the latest developed project, to verify the integration of physical security elements in the latest developed project, and to propose the project development model with physical security elements. Research methods used in identifying issues, analysing issues, integrating physical security elements, and proposing a project development model with physical security elements are through a questionnaire within organisation and related project teams. Findings from this research are analysed using Likert Scale Model as it can serve as a guide to rank the most common issue to the least common issue of physical security. The outcome of this research may be used significantly to improve the organisation's project development process.

ABSTRAK

Masalah-masalah yang tercetus akibat daripada kegagalan oleh perlindungan keselamatan fizikal telah menyumbang banyak masalah kepada asset di dalam harta tanah. Manusia, infrastruktur, dan informasi mengalami ancaman besar daripada keadaan ini. Syarat-syarat untuk keselamatam sekuriti fizikal yang berjaya di dalam harta tanah atau di dalam bangunan adalah seperti perimeter dan pagar, gerbang dan pengurusannya, menara pengawal, sistem kawalan akses, sistem pengawasan, pengurusan pekerja, bilik kawalan dan pengurusannya, rondaan, lampu pelindung dan sistem penggera kebakaran. Penyelidikan ini dilakukan untuk mengenalpasti dan menganalisa isu-isu keselamatan fizikal yang timbul di dalam pembangunan projek terkini, untuk mengesahkan integrasi elemen keselamatan fizikal di dalam pembangunan projek terkini, dan untuk mencadangkan model pembangunan projek dengan elemen keselamatan fizikal. Kaedah penyelidikan yang digunakan untuk mengenalpasti isu-isu, menganalisa isu-isu, mengintegrasikan element sekuriti fizikal dan mencadangkan model pembangunan projek dengan elemen sekuriti fizikal adalah melalui soal selidik dikalangan organisasi dan pasukan pembangunan projek. Penemuan dari penyelidikan ini dianalisa dengan menggunakan model skala likert kerana ia dapat menjadi panduan untuk menilai masalah paling biasa sehingga masalah paling jarang terjadi. Hasil penyelidikan ini boleh digunakan untuk meningkatkan proses pembanguna projek didalam organisasi.

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INTRODUCTION

1.1   Overview

Malaysia's crime index ratio per 10,000 populations in 2017 has increased to 309.7 as against in 2016 with 16, 902 cases of violent crime and 71, 760 cases of property crime (Department of Statistics Malaysia, 2019). Along with that, the development of property in Malaysia has reached RM36.1 billion in the third quarter of 2019 of work done in construction value (Department of Statistics Malaysia, 2019). A total of 5.6 million existing residential units is recorded in the first half of 2019 with a newly planned construction of another 36, 727 units to supply residential unit demand in Malaysia (Ministry of Finance Malaysia, 2019). In line with the increasing numbers of development, it is prevalent to extinguished newspaper's headlines with "Police's presence at PPR will increase security, eradicate crime" (Seng, 2019), "Apartment complex increases security after numerous car break-ins and theft" (Deputy, Supt, & Noor, 2019), "Women found dead, wrapped in a blanket" (Jaya & Ahmad, 2019) and immeasurably more residential crime located related news.

It is obvious now that security issues have become the highlight by the media. The feeling of safety and security is a crucial and fundamental need. Human rights, economics, environment, drug traffic, epidemics, crime, social injustice, and traditional concern from military threats are issues that have been receiving the so-called - high priority (Baldwin, 1997). Based on previous research, the context of security is generally divided into four main domains namely physical security, information technology security, political security, and monetary security.

Out of four contexts of security, physical security is defined as an organized system to protect humans, build, property, and assets against illegal access or intruders (Deutsch, 2019). However, throughout the established system, property residents are still feeling insecure, fear of crime, and inadequate safety (Tahir & Abdul Malek, 2018).

1.2   Problem Background

Previous research by Hutter (2016) highlighted that physical security is often the least of priorities where physical environment and facilities are designed with non-secured typical minded. Notwithstanding the least of priorities allocated, later research by Ojiagu and Nzewi (2019) suggested that business owners are recommended to provide multiple layers of security in their premises to protect their assets. The study on the impact of building performance's failures in the context of health and safety risk by Khalil and Kamaruzzaman (2018) explored the risk identification in enhancing building performance to the extent of providing comfortable and satisfaction to building occupants, thus suggested for the determination of the impact of building performance's failure and strategy to mitigate the impact to be further studied.

Pursuing continuous study by Khalil and Kamaruzzaman (2018), the scope of this research will be focusing on the integration of physical security in the project development model in Malaysia as a strategy to mitigate the impact of building failure in the context of safety and security in providing comfort and satisfaction to building occupants.

Physical security in residential property accommodates in keeping people safe and preventing unauthorised personnel from accessing the three main elements which are premises, human resources, and information. It is a core in ensuring trust and confidence in people around the building or the property where ordinary daily services could be delivered without any threat and if in any event, a crime happens, physical security's policy can meet its obligation under the Occupational Safety and Health Act 1994.

Premise's issues commenced from the failure of keeping the access safe from intruders can be related to the failure of an effective system in terms of gates system and its management team, patrolling standard operation procedure, and fire alarm system (Nityanandam, 2015). Among the items for measuring the feeling of safety are the feeling of secure when out walking in the neighbourhood at night, frequency of nocturnal outings within a particular period, feeling safe when out during the day, and feeling secure being home alone at night (Naghibi, Faizi, Khakzand, & Fattahi, 2015). Supplementary to that, a community surrounded by protective walls and fences in surroundings free from vandalism generated a perception of safety and privacy (El-Ekhteyar & Furlan, 2016). At this point, physical security does not only offer the sentiment of security, but also privacy. In addition to this, the main reason for focusing on ensuring physical security towards property is that it involves vast areas in the premises including house units, facilities area, utility area, and many common property areas which mainly will be occupied with societies.

Human resources' commenced issues address the most critical physical security elements is the protection of occupants in a property through manpower management (Nityanandam, 2015). However, the basic measure to act with regard to human resources' issues for the possible threat is the protection of perimeter and fences (WBDG, 2017). Continuously, the surveillance system could be applied in monitoring locations with limited visibility (Reed, 2017). Consequently, lack of physical security towards people and human resources' issues are affecting other high-rated issues namely; information.

Information issues are initiated by the failure to protect information and its critical elements, including the systems and hardware that use, store, and transmit that information (Zulhuda, 2012). However, instead of protecting a system and hardware, information issues in physical securities also protect people, software, and information (Mustaffar, Hashim, Bunawan, Kadir, & Bakar, 2016). This was supported by previous research by Haris, Sarijan, and Hussin (2017) which stated that information security has become a priority concern among information technology practitioners and the effective management of this discipline is essential for any organization to survive. Taking a broad view, the holistic approach in making certain information's physical

security from any threat includes introducing security personnel access to the control system and access into the control room and its management team. Unsuccessful management of physical security to information is resulting in various possible bad acts, from as simple as able to access the property at any time till the worst case which can access the main control room at any desired time and misuse the information kept in it. An interesting driver related to this topic mentioned with the proper system in an increasing number of crimes happening in residential property, it brings out a question, how well the involvement of these physical security elements in a developed project? Another driver for this topic is whether it is possible to integrate the physical security elements into a developed project? And is there any proposal that can be made to the project development model to integrate the physical security elements?

1.3   Problem Statement

Physical security issues are recognized after the completion of a project despite the fact that the issues and problems are well aware by the security team management of a building. Therefore, developers are starting to capture issues involving security context. However, awareness regarding the gap and between physical security context in the post-completion stage in the project life cycle and early design development stage is yet to be emphasized as one of the trade to be developed. The latest completed developed project has to be analysed in discovering three scopes of physical security which are access to a premise, human resources, and information.

Premise's issues originating crimes to areas in a property such as sabotage, accidental damage and natural calamities arise as a major concern in the failure of physical security in a property. Residents, building owner, and developer is dreadfully failing to feel and provide "perceived security" within the property with its access management to premises and its infrastructures. The issues involving premises is not just a small concern as it links with issues related to human resources.

Human resources or people's issues are the most immeasurable asset to be secured in a property. Failing to keep people secured could contribute to inconvenience, privacy interference, and crime onto residents, employees, guests, and vendors. To top that, poor physical security to protect human resources is the cause of information-related issues in a property.

Information issues are the focus of physical security policy in a commercial building, but not in residential buildings. Protection of information is vital where blueprints, process documents, and business data could be used against the whole people and premises in a property. Cyber-attacks, phishing, scam, fraud, and the worst that can happen are burglary, theft, and murder are all the disasters arising from the failure of information security.

Three main elements of security issues are to be a further study in this research to identify and analyse the actual issues happening in the latest developed project within the scope of premises, human resources, and information. The integration of physical security in the latest developed project should be imposed to practice a secured property environment. Considering the fact that physical security is contributing to main issues in a property, the outcome of the finding shall be developed into the proposal of the project development model with physical security elements.

1.4 Research Questions

The following discussion leads to several assumptions. Transformation to the project development model of a property should be introduced to comply with the current security demand. People are not looking for just a house, but a home to live in. Hence, questions arise:

i. What are the physical security issues that arise in the latest developed project?

ii. What is the verification of the integration of physical security elements in the latest developed project?

iii. How to propose the project development model with physical security elements?

1.5 Research Aims and Objectives

This study aims to identify the physical security issues in residential property and its analysis that accrue in the latest developed project with the identification of appropriate integration of physical security in the latest developed project, followed by the proposal of project development with the integration of physical security elements for residential property. To achieve this aim, the following objectives have been identified:

i. To identify the physical security issues that arise in the latest developed project

ii. To verify the integration of the physical security elements into the latest developed project

iii. To propose the project development model with physical securities elements

1.6   Scope of Study

The main thrust of this research is on the proposal of the project development model integrated with physical security elements, particularly a residential development property. Developers, professional consultants, and end-user is the main respondent in this research. The scope of this research is focused on the project development model in Malaysia. The target sample project referred to in this research shall be the completed project from 2014 until 2019, in the area of Klang Valley. This research is limited to the project developed by OCR Group Berhad. As a growing company in Malaysia, OCR Group Berhad offers a vast area for improvements in its project development model.

1.7   Significance of Study

The results of the study will be a great benefit to the property developer. The proposal for incorporation of physical security elements provides the possibilities to develop a perfect project development model from every aspect with not just the typical stage, namely land development, marketing development, design development, and construction development, but it integrates physical security elements in every project development stage. Findings from this research could be applied to deliver a "village community" where residents can live in a "perceived security".

The outcome of the research also allows developers, Joint Management Body, Management Corporation, and a community to accommodate physical security elements in the existing development. A house is once again a home.

1.8   Research Methodology

To achieve the objective of this research, a qualitative and quantitative technique method was taken into place as a whole. These types of methods are determined by many factors, namely the problem background, research objectives, research questions, and methodology used in previous research. The role of the research question and objectives is to establish limitations on the scope of the study. Therefore, data collection techniques used in this research are to establish the aim of this study, which is to identify and analyse the physical security issues in the latest developed project, to integrate physical elements in the latest developed project, and to propose a project development model with physical security elements.

The first stage of techniques used was a literature review. The definition of physical security and project development model is studied thoroughly. All the literature reviews were from previous studies, books, journal articles, conference papers and statistics from reliable sources. In regards to that, analysis of the physical securities issues in the latest developed project is perfectly studied. The research methodology's technique and method are summarized as below:

Table 1.1   Research methodology's technique used in the study

Research Question	Research Objective	Technique	Method
What are the physical security issues that arise in the latest developed project	To identify the physical security issues that arise in the latest developed project	Critical Literature Review Questionnaire	Qualitative Quantitative
What is the verification of the integration of physical security elements in the latest developed project?	To verify the integration of the physical security elements into the latest developed project	Critical Literature Review Questionnaire	Qualitative Quantitative
How to propose the project development model with physical security elements?	To propose the project development model with physical securities elements	Questionnaire	Quantitative

The second stage of the technique used was a questionnaire survey as a quantitative method to identify the integration of physical security elements into the latest developed project. This study uses a non-probability sampling, which in this case, the quantitative method used 132 questionnaire survey techniques, based on a 5% sampling error at 95% confidence level, which is based on a population of 10 professional personnel for each 20 ongoing and completed projects in OCR Group Berhad. The research methodology is summarized in the flow chart below:

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                    ┌─────────────────────────────────────┐
                    │          Background Study           │
                    │ Physical security and project       │
                    │ development model                   │
                    └─────────────────────────────────────┘
                                     │
                    ┌─────────────────────────────────────┐
                    │         Problem Statement           │
                    │              Issues                 │
                    └─────────────────────────────────────┘
              ┌──────────┴──────────────────┴──────────┐
    ┌───────────────────────┐        ┌───────────────────────────┐
    │  Aims and Objectives  │        │      Scope of Study       │
    │ Identification in     │        │  Setting the scope which  │
    │ solving               │        │  emphasizes the definition│
    │                       │        │  of physical security     │
    └───────────────────────┘        └───────────────────────────┘
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── Stage 1

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    ┌─────────────────────────────────────────────────┐
    │               Literature Review                 │
    │        Definition of Physical Security          │
    │          Project Development Model              │
    │             Physical Security Issue             │
    │    Theory of existing requirement of security   │
    └─────────────────────────────────────────────────┘
                            │
              ┌─────────────────────────────┐
              │     Research Methodology     │
              └─────────────────────────────┘
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── Stage 2

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    ┌─────────────────────────────────────────────────┐
    │                 Questionnaire                   │
    │  Draft submitted and approved for circulating   │
    └─────────────────────────────────────────────────┘
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    ┌─────────────────────────────────────────────────┐
    │                 Questionnaire                   │
    │                132 Respondents                  │
    └─────────────────────────────────────────────────┘
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── Stage 3

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    ┌─────────────────────────────────────────────────┐
    │      Data Analysis, Findings and Discussion     │
    └─────────────────────────────────────────────────┘
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    ┌─────────────────────────────────────────────────┐
    │         Conclusion and Recommendation           │
    └─────────────────────────────────────────────────┘
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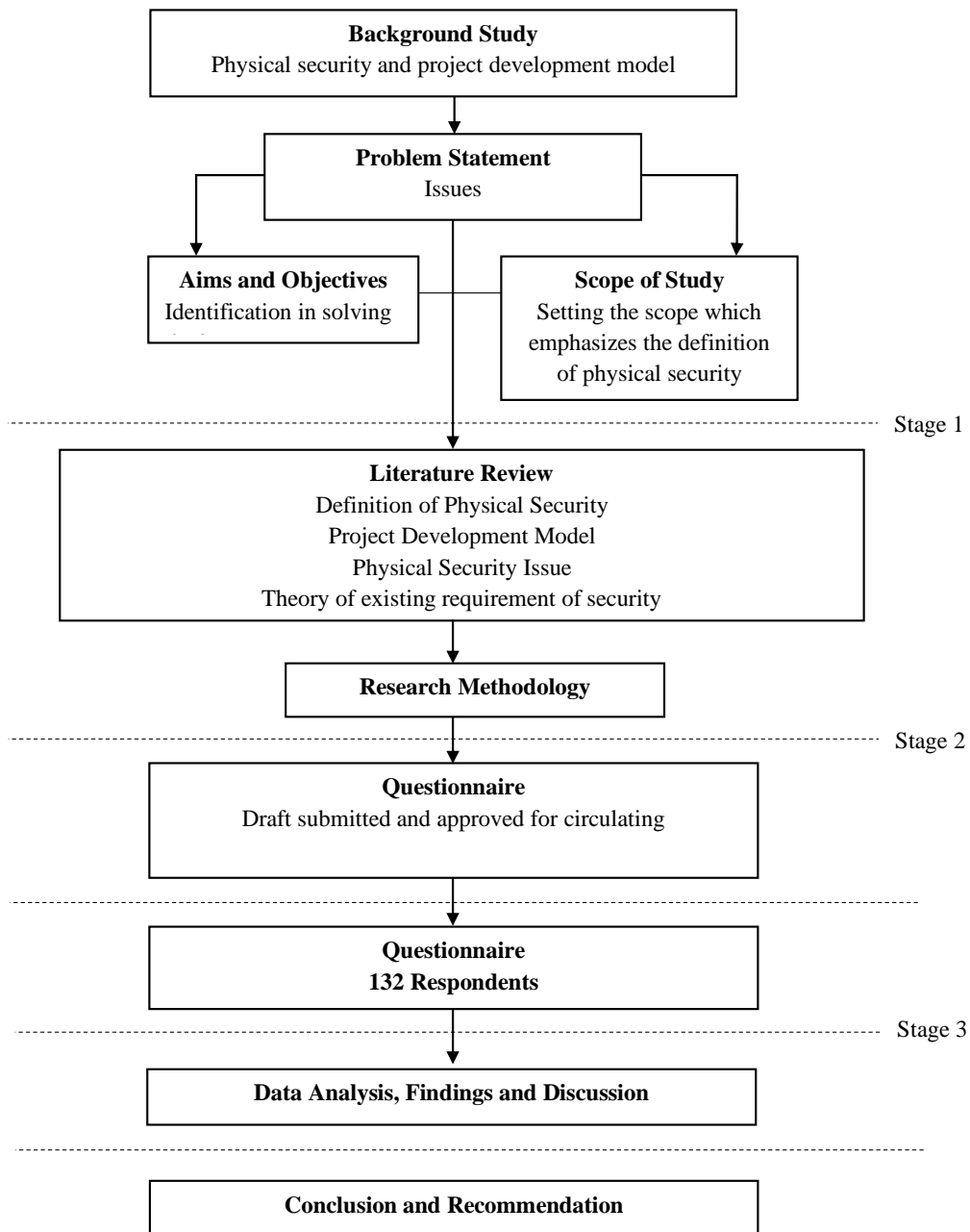
Figure 1.1   Research Methodology Flow Chart

1.9   Research Organisation

This project report consists of six chapters and the outline of the chapters is presented as follows:

Chapter 1: Introduction – Introduces the overview, problem background, problem statement, research questions, aims and objectives, the scope of the study, the significance of the study, research methodology and research organisation.

Chapter 2: Literature Review – Presents comprehensive literature reviews on the property development process and physical security issue in residential property. This chapter includes an overview of project development, project development model and physical security issues in a developed project.

Chapter 3: Research Methodology – Discusses and illustrates the methodology of this project by presenting the research methods, research workflows, and strategies, research framework to determine the research questions.

Chapter 4: Data Analysis, Findings, and Analysis – Presents the qualitative and quantitative data collection and analyses the case study and questionnaire survey, which aims to identify and analyse the physical security issue and the integration of physical security elements in the project development model. The findings are elaborated and described in the form of tables and graphs for easy reference. Factors are ranked based on their corresponding risk obtained from the feedback from respondents.

Chapter 5: Proposal for Project Development Model with Physical Security Element – Discusses the conceptual ideas to propose a project development model with physical security elements.

Chapter 6: Conclusions and Recommendation – Concludes the project by providing a summary of the work done in this project that involving the review of the achievements in the research objectives, theoretical and practical contributions, limitations, and future research suggestions.

1.10   Chapter Summary

Chapter 1 summarise the basic definition of the physical security and project development model. The context of security is generally divided into four main domains namely physical security, information technology security, political security, and monetary security. Physical security is the main context related to the property development field. Hence, physical security in a building or property is concentrating on access security requirement which is gates system and its management team, patrolling standard operation procedure and fire alarm, the protection of perimeter and, surveillance system, manpower management system, access in control system and access into the control room and its management team. With the identification of physical security context and its requirement, threats evolve around property targeting premises, human resources, and information.

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