

POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

**CRITICAL SUCCESS FACTOR ON EMERGENCY
PREPAREDNESS AND RESPONSE PLANNING IN
COMMERCIAL BUILDING**

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ABSTRAK

Kajian ini bertujuan untuk mengenal pasti faktor kejayaan kritikal (CSF) untuk kesediaan kecemasan dan perancangan tindak balas di bangunan komersial dan meneroka interaksi antara CSF tersebut. Data kajian bersumber dari tinjauan soal selidik dan wawancara separa berstruktur yang dijalankan di tiga bangunan komersial yang berbeza. Kajian ini membina sistem CSF pesanan ketiga yang mengandungi tujuh CSF: pemeriksaan keselamatan, rancangan tindak balas kecemasan, pendidikan keselamatan keselamatan dan latihan pekerja, laporan dan penyiasatan kejadian, persekitaran keselamatan, peralatan kecemasan dan kecekapan peribadi.

Antaranya, organisasi pengurusan didapati menjadi faktor utama yang mempengaruhi prestasi pengurusan kecemasan, sementara penghuni tingkah laku bangunan adalah faktor yang mempunyai kesan langsung. Implikasi untuk latihan dicadangkan. Kajian ini juga memperkaya literatur yang ada mengenai CSF dan penilaian prestasi pengurusan kecemasan dalam projek pembinaan bangunan komersial. Prestasi keselamatan bangunan komersial dapat ditingkatkan dengan berkesan dengan meningkatkan kompetensi profesional organisasi pengurusan keselamatan.

ABSTRACT

This study aims at identifying the critical success factors (CSFs) for emergency preparedness and response planning in commercial building and exploring interactions among such CSFs. Study data were sourced from questionnaire survey and semi-structured interviews administered in three different commercial buildings. This study constructs a third-order CSFs system containing seven CSFs: safety inspection, emergency response plan, emergency safety education and training of workers, incident reports and investigation, safety environment, emergency equipment and personal competency.

Among these, management organization is found to be the key factor affecting emergency management performance, while occupants of the building behaviour are a factor with a direct impact. Implications for practice are proposed. This study also enriches the existing literature on the CSFs and performance evaluation of emergency management in commercial building construction projects. Safety performance of commercial building can be effectively enhanced by improving the professional competence of safety management organizations.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF STUDY

In recent decades, urbanization process due to rapid development of economic have contributed to the growth of many big cities in Malaysia such as Kuala Lumpur. As a result, this has cause limitation in land space due to the increase in the population of occupants in these major cities. Therefore, many ultra largescale high-rise buildings over 100-meter have been constructed unceasingly by the developers, including office spaces. These high-rise building comprises of residential, office and commercial buildings such as hotels and shopping complex. In Malaysia, building that is built above 12 floors are considered as high-rise category.

Commercial buildings have been selected as the subject of this study. Commercial building is one in which at least 50 percent of its floor space is used for commercial activities. All workers have a right to work in the workplace where risk to their health and safety are properly controlled. If such emergency occurs at the workplace, the area needs to be secured in order to prevent unauthorized access, loss of life and also to protect the installation and equipment. Interaction with local police, fire brigade, healthcare departments and other nodal agencies is mandatory by Law.

Conversely, development of these commercial building has also proportionally contributed to the increase in potential safety hazards. Some of the examples of dangerous hazards that pose serious challenge and always being associated with commercial buildings are such as fire outbreaks, terrorist attack, release of toxic gas and etc. However, in Malaysia fire outbreak is one of the dangerous and most common hazards that can cause enormous casualties and property loss and hence influences the social stability and economic development of the country.

Generally, most of the high-rise building in Malaysia are equipped with standard safety features that can facilitate for minor or moderate emergency preparedness. Thus, an emergency evacuation from a commercial building is very unlikely to be practice, which subsequently results in less knowledge on the readiness, capabilities and effectiveness of fast evacuation from a commercial building. Knowledge from these findings is very vital as it can be used to improvise emergency preparedness procedures and save people from any injury or casualties.

Hence, an aim was created to meet the finding of the research that is to identify critical success factor on emergency preparedness and response planning in commercial building. In general, this chapter explains an overview of the background of the research, problem statement, specifying aims, scope of research and brief explanation of the methodology used to conduct the research.

1.2 PROBLEM STATEMENT

Emergency or disasters such as an incident involving fires, or explosions occur due to exposure to hazardous material as well as human error (Renschler et al, 2015). This disaster must be dealt with immediate response in order to prevent it from spreading out (Murali 2016). This unwanted situation can occur in any area such as hospital, hotel, shopping mall and commercial buildings.

Hence, lead agencies are built to assist the organization as well as providing the sufficient emergency equipment in the organization's premises (Sivakumar et al, 2018). Each organization should be equipped with emergency tools and be trained with related knowledge involving the relevant laws and mechanism of disaster management (Azuddin & Hassan 2008).

Good quality of emergency preparedness can help delaying the aftermath of the disaster (Sivakumar et al, 2018). Therefore, this research is to study the critical success factor on emergency preparedness and response planning in commercial building.

1.3 CENTRAL RESEARCH QUESTION

The main research question is towards what extend to identify critical success factor on emergency preparedness and response planning in commercial building? This question helps us to formulate the aim of this study? Although there is a practice of emergency preparedness and response are applied in the buildings, a strategic plan needs to be developed to enhance the emergency planning effectiveness in the company.

1.4 RESEARCH AIM

An aim was created to meet the finding of the research that is to identify critical success factor on emergency preparedness and response planning in commercial building. At the end of this research, the critical success factors will be produced to implementing effective emergency practice planning according to the data collected.

1.5 SECONDARY RESEARCH QUESTION

From the concerns raised, there are a number of issues that are fundamental to the overall implementation of this study. The purpose of this study is to obtain the following research questions:

- i. What are the roles and responsibility of each organization in a commercial building?
- ii. What is the systematic approach to survey and diagnose an emergency?
- iii. What is the emergency process, evacuation plan and contingency plan?

1.6 RESEARCH OBJECTIVE

In order to achieve the aim of the study and to answer the research question, several specific objectives have been identified:

- i. To identify the roles and responsibility of each organization in a commercial building.
- ii. To analyze systematic approach to survey and diagnose an emergency.
- iii. To propose the emergency process, evacuation plan and contingency plan

1.7 RESEARCH SIGNIFICANT

This study will investigate the factors on emergency preparedness and response planning in commercial building at Semasa Services Sdn Bhd's sites which includes Menara UOA, KWSP Raja Laut and KWSP Jalan Gasing. Expert interviews and questionnaire will be provided and carry out to obtain the research data.

This study focuses only on Semasa Services Sdn Bhd company that carry out facilities management at these three different locations. Respondents of this study consist of top management bodies, emergency management unit and building tenants.

CHAPTER 2

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

Emergency Preparedness and Response Planning (EPRP) is crucial in any commercial building (Snedaker et. al, 2014). Failure of EPRP can result in catastrophic situation that can affect thousands of lives, economic loss, and tarnish reputation of the organisation (tenant) and building owner (A. Albert et al, 2014). Effective Emergency Preparedness and Response Planning can help the organisation to prevent any unwanted occurrence thus increase the economy, reputation as well as employee functionality. A recent study proposed that healthy workplace environment provides a platform for employees to have a quality work life which leads into positive spill over effect (Ibrahim, I.I., et. al., 2013). There are few factors affect the Emergency Preparedness and Response Planning in a commercial building.

2.2 DEFINITION OF EMERGENCY PREPAREDNESS AND RESPONSE PLANNING IN COMMERCIAL BUILDING

2.2.1 OVERVIEW ON HIGH-RISE BUILDINGS

Rapid developments of information technology and economic have contributed to mass growth of big cities in Malaysia such as Kuala Lumpur. The city looked different from the way they looked over hundred years ago. All the urban landscapes are usually flat and uniform in pattern while the buildings were rarely over the height of a flagpole (Tharmarajan, 2007). Commonly, building refers to any enclosed structure constructed over a plot of land that has roof, walls, windows and floors. A tall building refers to any multi-story enclosed structure whose interior space above ground level is divided to minimum of 10 floors, where elevators are used by occupants to reach their destinations.

High-rise buildings are usually used for various purpose as a residential, administrative, commercial or for office use. Some of the advantages of high-rise building structures are such as efficient land use, act as landmarks and creates a unique skyline (Rangawala, 2010).

Various organization have tried to define what “high-rise” means since there was no universally accepted precise definition for it. There are as below:

- The New Shorter Oxford English Dictionary defines a high-rise as "a building having many stories"(Rupali Kavilkar and Patil February 2014).
- The International Conference on Fire Safety in high-rise Buildings defined a high-rise as "any structure where the height can have a serious impact on evacuation"(Rupali Kavilkar and Patil February 2014).
- Dr. Akram defined a high-rise building “as the building that its height will be affected by lateral forces resulting from earth quakes & wind forces to the extent that such forces will play a major role in the process of design” (Farouk 2011).

Lately, many ultra largescale high-rise office buildings have been constructed unceasingly by the developers in Malaysia. There are many reasons for developers to engage into construction of high-rise building in Malaysia. They are as shown below.

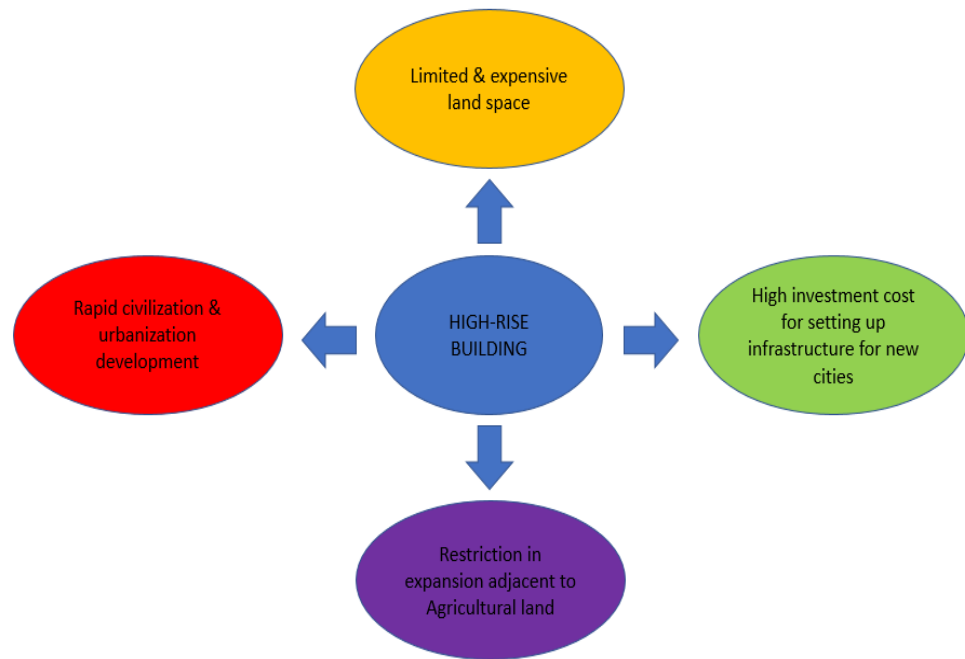


Diagram 2.1: Factors Contributed to the Development of High-Rise Building

2.2.2 DEVELOPMENT OF HIGH-RISE OFFICE BUILDINGS

Historically, the transformation of in the construction and design in high-rise building have taken place in the recent decades. The first generation of high-rise building are constructed using bricks and stone for the wall, steel and wrought iron for the beam, cast iron for the columns, and wood for the floor (SMC,2014). The only emergency exit for the building was a single stairway which is protected using metal-plated wooden door. This was followed by second generation where its interiors are full of load-bearing columns and walls, while the beams and columns are made from skeleton of welded or riveted steel. The developments that occurred in this generation were mainly improvements to address all the weakness from the first generation high-rise buildings. Lastly, the third generation comprise of mainly three types of construction. They were mainly reinforced concrete construction, steel framed construction and lastly the steel framed reinforced concrete construction (J. Hinze and P. Raboud, 2008)

2.2.3 EMERGENCY

An emergency is a situation that poses an immediate risk to health, life, property, or environment (Wikipedia,2020). Identifying a workplace emergency situation is vital to being able to respond appropriately and quickly. Some healthcare settings, such as emergency departments, will be confronted with emergency situations as routine. A workplace emergency, however, refers to an unexpected situation that:

- i. Threatens employees, residents and patients, and members of the general public;
- ii. Disrupts or completely shuts-down facility operations; or
- iii. Causes physical and/or environmental damage.

2.2.4 PREPAREDNESS

Preparedness is the term which indicates the level of precautions we can take much before any hazard occurs. It is simultaneously expected that a disaster might happen anytime, and we have to act according to our plan, using all our facilities built much earlier (M/s. AHW Unimark Consortium LLP, 2016)

The Federal Emergency Management Agency (FEMA) constitutes the following as emergency management preparedness responsibilities:

- Reducing hazards in and around their homes
- Preparing an emergency supply kit and household emergency plan
- Monitoring emergency communications carefully
- Volunteering with an established organization
- Enrolling in emergency response training courses (Federal Emergency Management Agency, 2008, p.17-18)

The 2004 National Response Plan (NRP) defines preparedness as, “The range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from domestic incidents” (Department of Homeland Security, 2004). Purchasing safety gear such as fire extinguishers, planning for an event such as mapping out an evacuation route or a meeting point, actively looking for information such as visiting emergency web sites, news articles, or reading publications, discussing emergency preparedness topics with friends, neighbors, or colleagues, or taking a more public activist role in emergency management are all measures of action.

2.2.5 RESPONSE

Emergency response is the phase of the emergency management cycle that often attracts the most attention and resources. During this phase, environmental health services may have a great impact on the health and well-being of affected communities. However, the impact achieved in the early days of the response is largely a test of previously-planned local and national preparedness and mitigation measures. Moreover, the way the emergency response has been planned and the way the emergency is managed will have a significant influence on post-disaster recovery and future development possibilities. The emergency response phase should therefore be seen as a critical part of the emergency management cycle (WHO, 2002)

2.3 RESEARCH CONCEPTUAL FRAMEWORK

NO	FACTOR	AUTHOR	1	2	3	4	5	6	7	8	9	TOTAL REFERRED
		Azuddin et al. (2008)	✓		✓							
		Murall R. et al. (2016)		✓			✓					
		Rasmi & Ahmad (2014)				✓		✓				
		Murray T. et al. (2013)	✓				✓					
		Kevin & Weldon (2009)	✓		✓							
		Elaine & John (2001)		✓		✓						
		Perry & Lindell (2003)	✓			✓						
		Hinze & Raboud (2008)	✓	✓			✓					
		Tharmarajan & Prashant (2007)	✓		✓							✓
		Rupali & Shweta (2014)		✓			✓					
		Bernama (January 12, 2011)				✓						
		Farouk (2011)			✓							✓
		Galea et al. (2008)	✓				✓					
		Rasmi & Ahmad (2014)		✓	✓							✓
		Mansor, N. B. (2012)				✓						
		Sheila & Akem Sadig (2012)	✓			✓	✓					
		Unimark Consortium LLP (2016)			✓							✓
		World Health Organization (2002)		✓	✓							✓
		Victor & Gerd (2013)	✓			✓						
		Christopher (2012)			✓							✓
												8
												6
												9
												8
												2
												8

Diagram 2.1: Conceptual Framework

2.3.1 SAFETY INSPECTION

The fundamental goal of an effective safety inspection is to eliminate or reduce safety risk before work begins. To achieve this goal, it is important to identify as many hazards as possible prior to commencing work (A. Albert et al, 2014). Usability inspection methods, such as heuristic evaluation, the cognitive walkthrough, formal usability inspections, and the pluralistic usability walkthrough, were introduced fifteen years ago (Hollingsed, 2007). These inspections with aim to protect workers from workplace hazards shall be conducted adequately and periodically (Snedaker et al, 2014). Safety managers (e.g., safety supervisor, project manager, and safety officer, etc.) is responsible to monitor and conduct adequate inspection on the emergency equipment (L.A. Renschler et al, 2015).

Safety inspections are also an effective way to discover potential safety problems and correct them to reduce the accident rate (Lawrence J et al, 2017). For effective safety inspection, emergency response checklists must be established in conjunction with expertise from ERT members and local civil emergency responders (fire, police, hazmat, bomb squad, etc.) (Snedaker et. al, 2014). Hazard identification, risk assessment and determine risk control (HIRARC) establishment is part of safety inspection to identify fire hazards, toxic gases, flammable materials, potential ignition sources, static electricity, and many more potential hazards (L.A. Renschler et al, 2015). Other than that, safety inspection help to ensure that the facility has prepare Emergency Response Plan (ERP) in accordance to the business processes (Lawrence J et al, 2017).

2.3.2 EMERGENCY RESPONSE PLAN

Establishment of Emergency Response Plan within organization is to help their communities prepare, mitigate, respond to, and recover from disasters and any emergency conditions (Huss et al, 2012). In the event of an incident, emergency rescue is the most efficient way to minimize loss. Establishment of Emergency Response Team (ERT), evacuation route and floor plan, evacuation or emergency procedure, and action plan to mitigate the danger are the components in the Emergency Response Plan (L.A. Renschler et al, 2015). Having an effective Emergency Response Plan (ERP) is a minimum standard practice for professional organisations (Ferraro et al, 2011).

ERTs should know and able to perform the skills required to address the specific needs of the company's operations when dealing with an emergency (Snedaker et. al, 2014). Written emergency plans and procedures must be established and continually review among the management, employees as well as local civil emergency responders to ensure the plan is fit enough with the organisation operation. Training for employees especially ERT members must be provided according to the plan and procedures requirement (L.A. Renschler et al, 2015). when an emergency does not go according to plan, it is possible to lead to significant damage (Ferraro et al, 2011).

2.3.3 EMERGENCY SAFETY EDUCATION AND TRAINING OF WORKERS

Performance of Emergency Response Team can be improved if all workers are well educated and trained efficiently. Training is imperative for ERT members and must be as realistic as possible (Lawrence J. et al, 2017). Education and training are used to improve worker safety awareness as well as knowledge and skills to prevent accidents or minimize the impact. Use of a variety of educational strategies, including both traditional ones, such as lectures and case studies, and less familiar ones such as tabletop exercises

and drills (Silenas et al, 2007). Training for ERTs should be refreshed and tested periodically (Snedaker et. al, 2014).

Training for ERT members may include firefighting, CPR, first aid, hazardous material containment, and other skills appropriate to the location and nature of the business (Lawrence J. et al, 2017). Regardless of ERT members' professional background, education for personnel operating in emergency situations should be based on the evacuation procedure in accordance to the organisation's business operation. These training must be provided by accredited education and training programs centers (Gallardo, 2016).

2.3.4 INCIDENT REPORTS AND INVESTIGATION

Any emergency or incident that has occurred in an organisation's premise or workplace must come out with an incident report. Accident analysis conducted after an incident is to identify the root causes and this can be used for future accident prevention (Shamsul, 2016). Other than root cause analysis, corrective action and prevention action is also included in the accident report (A. Albert et al, 2014). Accident and investigation reports must be well kept and recorded ensuring that accidents are handled appropriately. The report can be used for continual improvement for incident management in the future (Shamsul, 2016).

If an incident or emergency had occurred, the current hazard identification, risk assessment and determine risk control (HIRARC) and emergency procedure must be revisited in accordance to the incident. This help to enhance organisation preventing the occurrence of such incident at their workplace (A. Albert et al, 2014).

2.3.5 SAFETY ENVIRONMENT

Safety environment covers a wide scope including physical environment (e.g. light and temperature) and site layout of the workplace. A good safety environment in an office building guarantees safe conditions thus able to reduce potential onsite hazards (Ibrahim, I.I., et. al., 2013). With involvement from management in establishing policies and procedures as well as providing safe workplace such as proper office layout and comfort helps in improving the employees' productivity. Good practice of safety environment at the organizational level can help to reduce the risks of any injuries within the workplace (L.A. Renschler et al, 2015).

Good arrangement of office layout which also include at least two evacuation routes at each level in commercial building help to minimize the impact of an incident (Lawrence J. et al, 2017). When emergency occur, Emergency Response Team members are able to manage and handle the panic situation when floor layout is safe and free from any obstruction (Shamsul, 2016). A good practice of safe environment in workplace help to enhance effectiveness of EPRP.

2.3.6 EMERGENCY EQUIPMENT

Commercial buildings consist of many floor levels. These buildings should be designed in such a way that occupants can escape by themselves through emergency route in case of emergency (e.g. fire) (A. J. Isiwale et al, 2018). With effective and periodically maintenance of safety equipment in the building can help to reduce the impact of an incident (Shamsul, 2016). Ensuring the quality of emergency equipment are in ideal condition. Occupants also need to be well briefed by the management, ensuring all emergency equipment in order as per quality and safety assurance of the building (Sivakumar et al, 2018).

Preplanned simulation of an emergency evacuation for a specific incident scenario can improve the performance of the occupant population and/or staff present (Gwayne et al, 2017). The Emergency Response maintenance team able to detect any malfunction equipment when regular inspections and drills are conducted in the building. Maintenance must be conducted as scheduled on each emergency equipment (Sivakumar et al, 2018). Besides that, regular fire drill in commercial building will help to increase awareness level within the occupants (tenants). Pre-disaster preparation is ultimately the key to successful workplace emergency response (Renschler et al, 2015).

2.3.7 PERSONAL COMPETENCY

ERT member is the first point of contact within the organization in the event of accidents and emergencies (Sivakumar et al, 2018). Thus, competency is the "best way" of fulfilling a task, thus improving efficiency and increasing productivity (Gravan, 2001). Since ERT members consist of few critical functions, it is advisable to send other employees attending courses that able to help during the emergency (Lawrence J. et al, 2017).

Example for this situation is First Aider. If all ERT members are too busy managing the emergency, other staff with First Aider competencies able to come forward and start by giving medical treatment to those who are in need while waiting for health professionals to arrive at the scene. Personal competency helps a person to be more efficient (Gallardo, 2016).

2.4 CHAPTER SUMMARY

In this literature study, the researchers have described some basic knowledge of the research being carried out such as the details of the definition, the background of the study. At the beginning of this chapter, the researcher provided some basic knowledge of the topic of the study conducted on the basis of data collection regarding the factors on emergency preparedness and response planning in commercial building. Literature review help researchers to identify the research gap that needs improvement. In addition, the literature review from the previous study helped to formulate a study of the framework to achieve the research objective.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

The chapter explains the techniques used to conduct the study's modus operandi in more depth. Methodology is a method used in response to research questions to collect data more efficiently. This research method is a key element in the study and implementation of a structure that consists of data collection procedures and guidelines to complete the analysis for the whole study.

The methodology in the study should be properly designed and applied so that the data collection process is carried out without any constraints in conducting this study. In addition, the aspects discussed include study design, variable measurement, instrumentation, studies design, validity and data analysis. In this study, the researcher chose a mixed method to obtain the study data. The mixed method will refer to the methodology emerging in the systematic study involving qualitative and quantitative data through research. This method also helps the researcher in the process of analyzing and interpreting the results of the research.

Therefore, the methodology in the study should be designed and applied in a comprehensive and accurate manner so that the process before and during the study can be carried out without hindrances that may affect this study.

3.2 PHILOSOPHY AND RESEARCH APPROACH

In study research, there are various philosophies and studies involved. The researcher chose the Saunders philosophy of the 2012 Research Onion which was used as a methodological approach in general. Onion research model that has 6 layers of philosophy, approach, methodology, strategy, time horizon, technique and procedure Lewis et al (2012). There are three approaches commonly used in studies that are deductive, inductive and abductive. Each approach adopted brings different terms and procedures Merrigan et al (2004).

3.2.1 RESEARCH PHILOSOPHY

The philosophy of pragmatism research describes relevant concepts that support their actions Thornhill et al (2012). Pragmatism is used in data collection techniques and analysis procedures in research design to facilitate data collection and relevance.

Creswell (2012) states that hidden research is done to affect the study and is important for discovery in a research. Thus, there is some pragmatism that researchers have chosen to explain the techniques used.

In pragmatism there are three types of approaches that can be selected by Saunders (2011): -

- i. Deductive
- ii. Inductive
- iii. Abductive

Deductive

Research using quantitative approaches only. This approach is used to test the theory, where researchers can develop the anchor made and design a working strategy to test the theory that has been formulated.

Inductive

A researcher begins by collecting data that is important to his or her topic of interest in an inductive approach to science. Once a large amount of data has been compiled, the analyst will then take a breather from data collection and step back to get a glimpse of her data from a bird's eye. The researcher is looking for trends in the data at this point, focusing on creating a hypothesis that could describe such patterns.

Abductive

Abductive approaches are made to study phenomena, to identify themes, to explain the theme of a phenomenon to produce a new theory. This approach is usually a combination of qualitative and quantitative.

Therefore, to achieve the aim of this study an abductive approach was chosen by the researcher to analyze the data in the study of critical success factor on emergency preparedness and response planning in commercial building

3.3 RESEARCH DESIGN

Study design is the structure used by a research to analyze data, according to Bryman (2008). Study design aims to turn research questions into projects involving objectives, hypotheses, study issues, methodology and sampling techniques, Robinson (2011). Meanwhile, Creswell (2009) pointed that plan is a study program or concept requiring contact with theory of science, research policy and research methodology. In addition, the design is used to determine the strategy and appropriateness of selecting a statistical test to analyze the study data. Based on Figure 3.3, the study design consists of five components that are based on Maxwell's theory of 2012. Through his study design which shows the relationship between the five components: goals, conceptual frameworks, study design, method and validity. The research question is considered a central point and in other words all of these components can answer all the research questions for the research that have been made. In addition, the components of this study are related to the conceptual framework and methods of study because the purpose of this study will be to develop a conceptual framework while at the same time it will determine the appropriate method of obtaining research information and answering questions.

Validity has a relationship between objectives, conceptual frameworks, methods and questions of research. Both elements must be checked either through authorization and formal expert interviews or through the use of a system software commonly used by most researchers to show the study's validity and reliability.

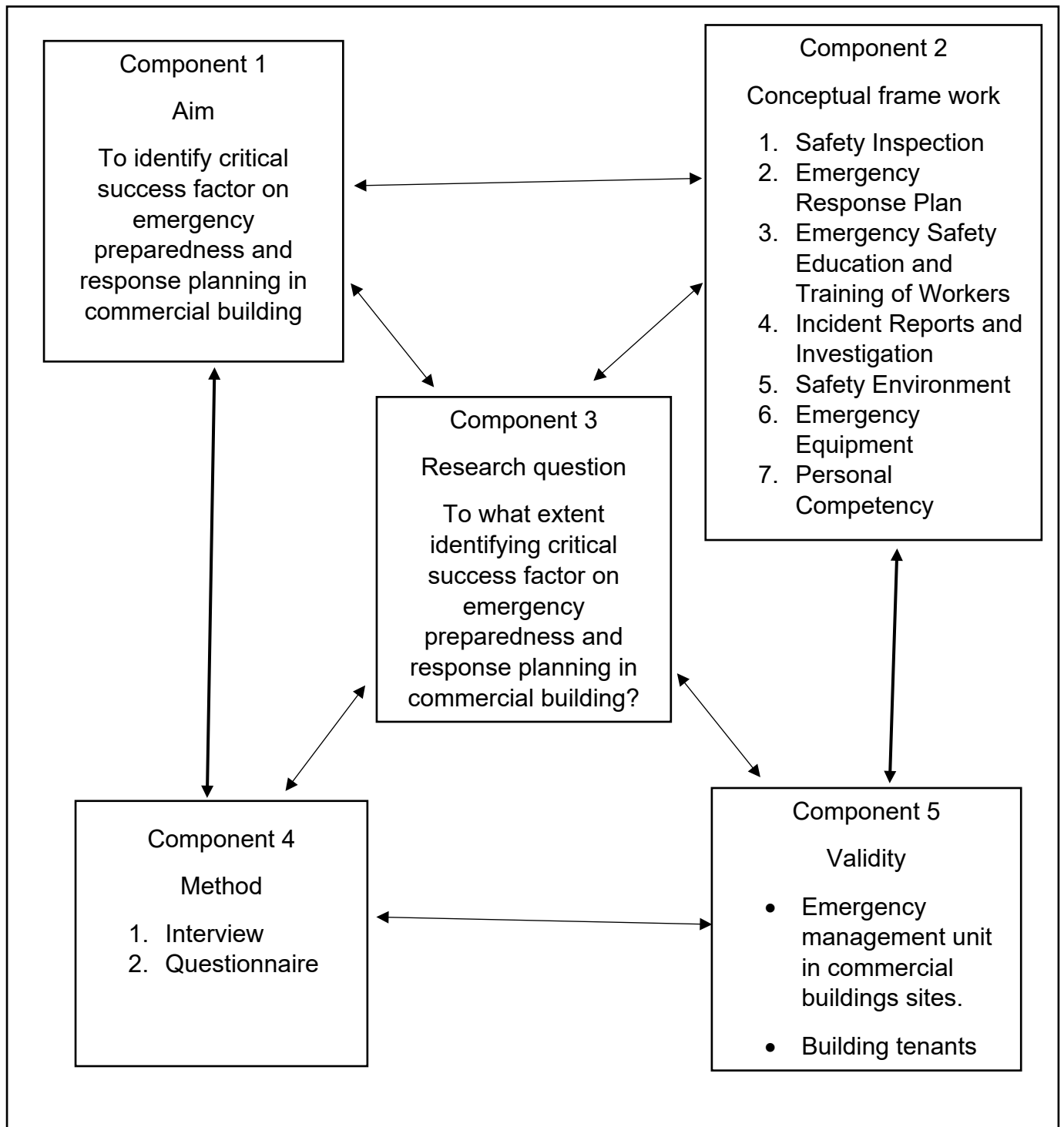


Diagram 3.1 Research Design

The data collection method used by the researcher is a mixed method. As a technique, in a single study or sequence of experiments, it includes methodological principles that govern the course of data collection and analysis and the combination of qualitative and quantitative results. The central premise is that the application of the use of quantitative and qualitative methods provides a better view of issues in study than either method alone. Creswell and Plano Clark (2007: 5) Therefore, to achieve the aim of this study, abductive emphasis will be used where this study is a combination of quantitative and qualitative approaches. Therefore, abductive emphasis is used to achieve the goals of this study. Abductive is a combination of quantitative and qualitative approaches.

3.4 RESEARCH INSTRUMENT

In conducting the research, the research instrument needs to be defined first. There are several research instruments that can be used for the data collection process for the study:

3.4.1 INSTRUMENT ONE: INTERVIEW

For this interview, this research will be focusing towards the emergency management unit for each commercial building. Interviews are a two-way communication process for getting real information (Chua, 2006). Interview consists of the three types of structured interviews, semi-structured interviews and unstructured interviews. Structured interviews are a form of questionnaire that is delivered orally. Throughout structured interviews, the interviewer is given a set of pre-determined questions. During the interview, the questions will not be modified and no follow-up questions will be asked for a clarification of the answer given. Unstructured interviews are usually described as purpose-driven interactions – capturing research study results.

Semi-structured interviews provide the interviewer with substantial leeway to evaluate the respondents as well as preserving the basic structure of the interview. Even though this is a directed dialogue between researchers and interviewees, the researchers are given tremendous versatility. Thus, the semi-structured interview method was used to achieve the goals in this study.

3.4.2 INSTRUMENT TWO: QUESTIONNAIRE

For this questionnaire, this research will be focusing towards the building tenants for each commercial building. Using questionnaires as a more practical and effective tool can help reduce the expense, time and energy of data collection Mohd Majid Konting (1998). Questionnaire is a form of instrument for obtaining facts about a current situation and practice. It is also used to study attitudes and opinions Deobold B. Van Dalen (1962). In the study, the researchers used questionnaires to obtain information from building users. Because the majority of building occupants are regular communities, data collection methods through questionnaires can help you get the right data.

3.5 VALIDITY

The validity of this study is to test the extent to which the instruments used in the research include content relevant to the purpose of this research Miller (1994). Therefore, the validity test is performed to see how far the instrument is being used to measure what should be measured.

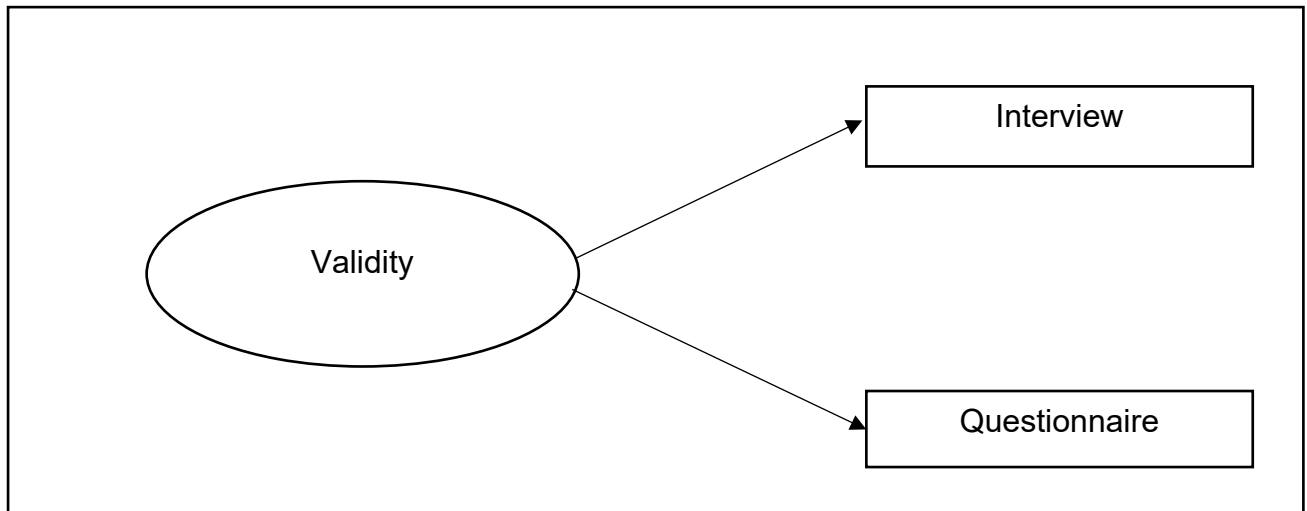


Diagram 3.2: Research validation techniques

The validation process in this study involves two steps to the validity of this study, the researcher divides the validity into two phases: the literature search phase and the data analysis.

3.5.1 LITERATURE REVIEW SEARCH PHASE

Search comprehensive reviews of literature reviews for all the possible uses as a gauge. Further, in the construction of conceptual frameworks and indicators in the study. Therefore, the aspects of the verification process described in the questionnaire design as a pilot study as well as the main study and semi-structured interviews. In search of literary highlighted it is necessary to answer the objectives of this study.

3.5.2 DOCUMENT ANALYSIS PHASE

Prior to the process of analyzing the workforce, the researcher conducted a series of interviews and questionnaires to ensure that the data obtained from management and building users were similar to the data obtained by the emergency management unit of the commercial buildings in this study.

3.6 SUMMARY

This chapter discusses the research methods and approaches used from the beginning of the study to the stage of data analysis to assist in obtaining data and information to obtain research results. In the first phase of the study, data collection began with reading the book, publishing articles, and referencing the previous study to understand the issues and issues to be addressed. Through the issues identified, researchers will formulate a number of research questions. Once the research question has been raised, a number of research objectives are formulated to make the study more focused. A conceptual framework was developed to briefly describe the overall concept of the study.

CHAPTER FOUR

4.0 DATA COLLECTION

4.1 INTRODUCTION

Data Collection is a mechanism through which the researcher collects the knowledge from all available sources to find solutions to the study question, test the hypothesis and analyze the findings. Furthermore, the responses to questions where the researcher asks how, where and where the data is to be obtained.

The choice of methods for gathering data depends on the research issue under analysis, the nature of the research and the knowledge collected about the component. The strategies for gathering data may be narrowly divided into two categories:

- a. Primary data collection method
- b. Secondary data collection method

4.2 RESEARCH SAMPLING.

Sampling is the process of selecting a group of people, institutions, places, or phenomena from a large group or research. In this study, the researcher selected several samples to be grouped in semi-structured interviews. The sample in this study consisted of experts with experience in emergency management. In addition, the researcher selected two samples that were directly involved in Emergency Management Committee and the building occupants. The purpose of this sampling is to obtain more detailed and detailed information on emergency management unit.

Furthermore, the use of sampling is intended to enable the researcher to determine the appropriate and specific respondents for the purpose of the study. There are also some researchers who use this sampling in the early stages and the beginning of their research solely for specific purposes such as testing the questionnaire or obtaining quick feedback. However, the findings from the study using this sample do not represent a specific population but at least provide a preliminary picture of the field of Syed Arabi Idid (1998); Wimmer & Dominick, 1997).

In addition, sampling is also related to the process of selecting subjects from a population to be the respondents of the study. Improper use of samples will reduce the validity and reliability of the study. Proper sampling design facilitates data collection, minimizes measurement error and saves time and expenses Sabitha (2006). The design of the sample is determined based on the purpose of the study, the sample size required, the cost and time allotted by the study. Research using samples provides opportunities for research to get more detailed and accurate information about populations.

4.3 SAMPLING DESIGN

According to Sabitha (2006), the sample design is calculated based on the research objective, the sample size needed, the expense and the time allotted. In general, sampling techniques can be divided into two types:

4.3.1 PROBABILITY SAMPLING

Sampling of probability means that each item within the population has an equal chance of being included in the sample. One way to perform random sampling would be to build a sampling frame first and then use a random number generation computer program to collect a sample from the sampling frame (Zikmund, 2002). Probability or random sampling provides the greatest independence from bias, but may reflect the most time- and energy-consuming survey with a specified degree of sampling error (Brown, 1947). Probability

sampling methods include simple, stratified systematic, multistage, and cluster sampling methods.

4.3.2 NON- PROBABILITY SAMPLING

Non-probability sampling is also connected with the nature of research paper studies and qualitative analysis. As for the above, research papers appear to rely on limited populations and are meant to examine a particular world event, not to draw statistical inferences in comparison to the larger population (Yin, 2003).

The basic random sample implies that the likelihood of inclusion in the survey is equivalent for each population scenario. Simple random sampling related drawbacks include (Ghauri and Gronhaug, 2005). Non-probability sampling methods include purposive, quota, convenience and snowball sampling methods.

Probability Sampling Techniques	Explanation
Simple Random	Used to ensure that each unit or subject in the population has the same opportunity to be selected as the respondent of the study
Systematic	Every unit or subject in the population has the opportunity to be selected as the respondent
Cluster	For a population that involves a large area and a large number of subjects in the population
Randomly layered	Separate random selection for each subgroup in a population

Diagram 4.1: Probability Sampling

Non probability Sampling Techniques	Explanation
Dimensional	For small cases where there is only a small subset of subjects with special characteristics that the researcher is interested in
Quota	Sample group members are selected on the basis of specific criteria
Coincidentally	The researcher selects any subject that is found
Purposive	A group of subjects with specific characteristics were selected
Snowball	The study respondents were asked to suggest other subjects with characteristics that are suitable for the study
General variance	Individuals or groups of individuals are selected to represent the lowest and highest levels of a characteristic
Critical case	Specific cases involving strange, unusual or rare behaviour.

Diagram 4.2: Non probability sampling

In this study the researcher selected the probability sampling as a sample. The researcher selects individuals from the pollutants that can represent the population. the probability sampling procedure is performed by randomly selecting the sample subject, where the subject in the sample has all the characteristics of the study population before the probability sampling procedure is performed, the researcher needs to identify the population size and get a list of subjects in the population. For this study, the population consist of building occupants from three different office building which are Menara UOA, KWSP Raja Laut, Menara CIMB.

4.4 SAMPLE SIZE

According to Abdul Ghafar (2003), population is a group of people with similar characteristics. The study population refers to the target group of the study activities. In a given study, the researcher was not able to use all available populations but only to use the sample to represent the sample being studied. Whereas according to Abbott (2002), the sample was a small number of individuals from the population included in the study. According to Krejcie and Morgan (1970), samples can represent population size. The use of samples from the population is intended to facilitate the work of researchers (Gafar 1998).

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Diagram 4.3: Krejcie and Morgan

No	Facilities Management Organization	Total Population	Total Sample Size Required	Sample Size
1	MENARA UOA	20	60	35
2	KWSP RAJA LAUT	20		35
3	MENARA CIMB	20		20
Total		60		60

Diagram 4.4: Total sample size required

4.5 DATA COLLECTION INSTRUMENTS

Data collection instruments need to be determined before the study is conducted. There are several research instruments that can be used for the data collection process. A questionnaire survey and a semi-structured interview were used to collecting data.

4.5.1 QUESTIONNAIRE

A questionnaire is the principal means of collecting key quantitative results. A questionnaire allows the collection of quantitative data in a standardized manner, so that the data is internally consistent and coherent for analysis. Questionnaires should always have a definite purpose related to the research goals, and it must be clear from the beginning how the findings will be used. (Roopa & Mani, 2012). Close ended questionnaire was used by the researcher to collect data from the respondent. The respondent will be provided a set of preset answers to pick their answer from. The collection of responses will contain any conceivable answer which does not conflict with the context of the responses.

An example of a similar survey query will be, "Please score how strongly you agree with the following statement or disagree with it: 'I feel comfortable about my work on the job.' Do you strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, or strongly disagree?" A Likert scale, used in the above example, is a widely used collection of answers for closed-ended questions.

4.5.1.1 SURVEY QUESTIONS

Section A: Respondent demographic

This section was created to find out the socio-economic information of the respondents who will answer the questionnaire. Demographics include:

- Age
- Gender
- Building
- Years of working experience
- Education background
- Awareness about emergency preparedness in your organization

Section B: Roles and responsibility of organization

ITEM	Statement
B1	Do you agree that emergency evacuation will be effective when actual emergency occur?
B2	Do you agree that tenants of the building will follow all the emergency evacuation steps according to the actual plan?
B3	Do you agree that contingency planning will be effective when actual emergency occur?
B4	Do you agree that safety inspection can provide effectiveness when actual emergency occur?
B5	Do you agree that incident reports and investigation will provide usefulness when contingency planning?
B6	Do you agree that emergency equipment will be effective when actual emergency occur?
B7	Do you agree that safety environment plays an important role when actual emergency occur?

This section is used to obtain information from building occupants based on management role constructs. The findings of this section are analyzed using SPSS software and will be discussed to answer objectives one and two.

Section C: Systematic approach on diagnosing an emergency.

ITEM	Statement
C1	I am very familiar with our building's evacuation plan
C2	It would be easy for a potentially threatening non-employee to gain access to my workplace.
C3	My organization has provided each employee with a basic emergency preparedness kit.
C4	In the event of an emergency, I am familiar with my organization's plan to continue operations from another location
C5	As part of our contingency plan, customers and suppliers would be able to contact us for information
C6	My organization has contingency plans in place so our staffs would be covered if we suffered a disaster.
C7	I know where the nearest emergency exits are to my desk/workstation
C8	My organization's emergency plan has been coordinated with local agencies, such as the fire department, hospitals, etc
C9	If a crisis and evacuation occurred at my organization, I am familiar with our plan on how to communicate with my fellow employees from scattered or emergency locations
C10	Most of our employees are familiar with my organization's emergency plan.

This section is used to obtain information from building occupants based on operational control constructs. The findings of this section are analyzed using SPSS software and will be discussed to answer objectives one and two

4.5.2 INTERVIEW

4.5.2.1 SEMI STRUCTURED INTERVIEW

Interviews are performed mainly in qualitative studies, which arise when researchers ask broad, open-ended questions to one or more subjects which document their answers. Audiotapes are also used to facilitate more accurate transcriptions (Creswell, 2012). Semi structured interview was used by the researcher to collect data from the respondent. Semi-structured interviews are those in-depth interviews in which subjects have to address open-ended questions in advance and are thus commonly used in their study by practitioners. Semi-structured, in-depth interviews can be used widely as a method for interviewing a person or even a community at times. (Corbin J, Strauss A, 2018). Semi-structured interviews include the characteristics of both structured interviews and unstructured. In semi-structured interviews, the moderator presents a series of same questions for all interviewees to respond. Around the same time, supplementary questions could be posed during interviews to explain and/or extend any concerns further.

Interview question:

QUESTION 1

What are the critical success factors of emergency preparedness and response planning that you think are the most crucial to implement at your site?

PURPOSE

Researchers want to know the emergency management methods practiced whether the methods used are efficient or otherwise. Emergency management includes various aspects and methods that can be applied according to the criteria and requirements of building management.

QUESTION 2

How regular is your current emergency plan being tested?

PURPOSE

This question is designed to find out more about the pattern of emergency plan from the emergency management that conducts emergency management practices here. The pattern of emergency plan depends on the emergency management planning practiced.

QUESTION 3

What type of evaluation plan that need to be observe before the actual emergency occur?

PURPOSE

Researchers want to know the factors that drive for emergency management planning in the building. Factors in the form of guidelines, manuals and so on are studied to know the planning strategies used in the selected buildings.

QUESTION 4

How to create such effective contingency plan?

PURPOSE

Researchers on the effectiveness of emergency management through the methods used. Therefore, the researcher can analyze the applied practices to find out the best practices. In addition to knowing practices that need improvement in order to suggest more effective strategies.

QUESTION 5

What are your suggestions to increase the effectiveness of ERP in a commercial building?

PURPOSE

Researchers want to get suggestions from leader of emergency unit to make improvements to existing emergency management strategies. Emergency management unit from selected buildings have over 5 years of experience in emergency management. Therefore, the proposed improvements can ensure the effectiveness of emergency preparedness and response planning.

4.6 PILOT TEST

This validity test needs to be done by the researcher to obtain the authenticity, accuracy and usability of the questionnaire that has been formed to achieve the objectives of the study. The purpose of this pilot test conducted is to measure the reliability of the statement in the questionnaire used. Table 4.4 shows the Cronbach's Alpha readings obtained with a total of 20 respondents.

Section	Cronbach's Alpha Value	Item
B	0.795	7
C	0.795	10

Diagram 4.5: Cronbach's Alpha Value for pilot test

Based on table 4.4, the researchers recorded the Cronbach's Alpha for reading of the questionnaire and validity tests were performed for sections B, C, D, E and F using the Likert scale. Data from the pilot test obtained will be analyzed and problematic items will be corrected. Referring to Sekaran 1992, Cronbach's Alpha values of 0.60 - 0.80 are good and readings above 0.80 are excellent readings. Even readings less than 0.6 require improvement, unacceptable and invalid. Researchers have obtained a Cronbach's Alpha value of 0.70 and above for each section. This proves that this questionnaire exceeds the stated level. Further can be used to obtain actual data for the research.

4.7 SUMMARY

The researcher has described the data collection method used in this study. This chapter also provides an explanation of the instruments used by researchers in obtaining adequate data. Furthermore, the selection of the right research instrument plays a very important role in achieving the objectives of the study. Researchers have used questionnaires and semi-structured interviews to answer research questions.

CHAPTER FIVE

5.0 DATA ANALYSIS

5.1 INTRODUCTION

This chapter is the most important part of the research, where this chapter will describe the findings of the research as a result of the mixed method that has been used to collect data. This chapter will also give the results of the study from the data collection that has been done. The data collected is analyzed to answer the research questions as well as help achieve the objectives of the study built through the problem statements that have been identified. Both instruments that have been selected by the researcher help in achieving all three objectives. The analysis performed gives clear processing and will justify the objectives of the study. Every aspect related to emergency management practices applied in the three selected office buildings will be described in this section.

To obtain data on emergency management in commercial buildings, survey forms were distributed to building occupants. A total of 60 questionnaires were distributed to each building, namely Menara UOA, KWSP Raja Laut and Menara CIMB to collect the data. Each of the 60 respondents selected represents each building. The number and representative of respondents are selected according to the recommendations from the customer service division of each building responsible for managing the building. For the semi-structured interview method, facility managers or engineers from those buildings were selected to obtain data. Researcher have interviewed the two facility managers and one engineer face to face to obtain data on emergency management.

The results of the study analysis obtained will be shown in the form of tables and diagrams. The data obtained from questionnaire survey will be analyzed using SPSS software (26.0). The analysis method used is in the form of percentage, mean and standard deviation obtained through SPSS software.

5.2 RESPONDENT DEMOGRAPHY

Demographics of these respondents provide an explanation of the background of the individual who has answered the questionnaire. A total of 60 questionnaires were distributed to respondents from the three buildings to achieve the objectives of the research. Socioeconomic characteristics of respondents comprising of:

- Age
- Gender
- Building
- Years of working experience
- Education background
- Awareness about emergency preparedness in your organization.

Demographic information of each respondent that has been received through questionnaires is explained in the form of diagrams to facilitate understanding.

5.2.1 ANALYSIS OF RESPONDENTS BASED ON THEIR AGE

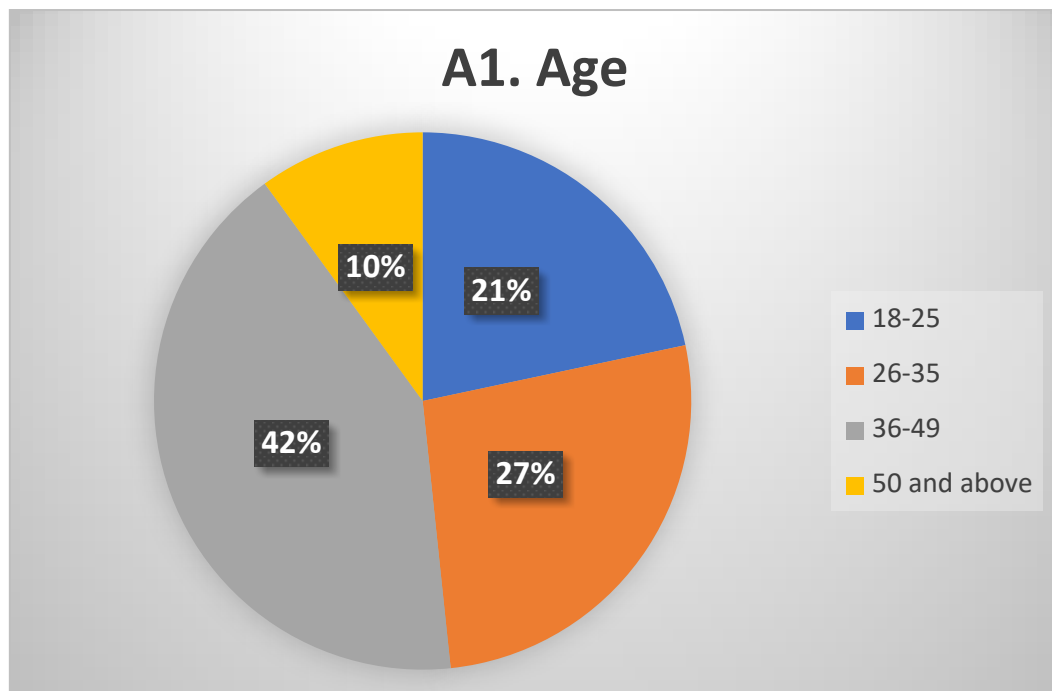


Diagram 5.1: Pie chart of respondent's age

As shown in Diagram 5.1, four levels of age have been obtained among the 18-25, 26-35, 36-49, and 50 and above. Refer to the pie chart above, the level of 36-49 years old got the first highest choice. Percentage for the number of Diploma holder are 42% equivalent to 25 respondents.

The second-highest result 26-35 is where the percentage are 27% equivalent to 16 respondents. The third highest is 18-25, which shows are total of respondents is 13. Where the percentage are 21%. Lastly is the master bachelor where the total number is 6 people equivalent to 10%

5.2.2 ANALYSIS OF RESPONDENTS BASED ON THEIR GENDER

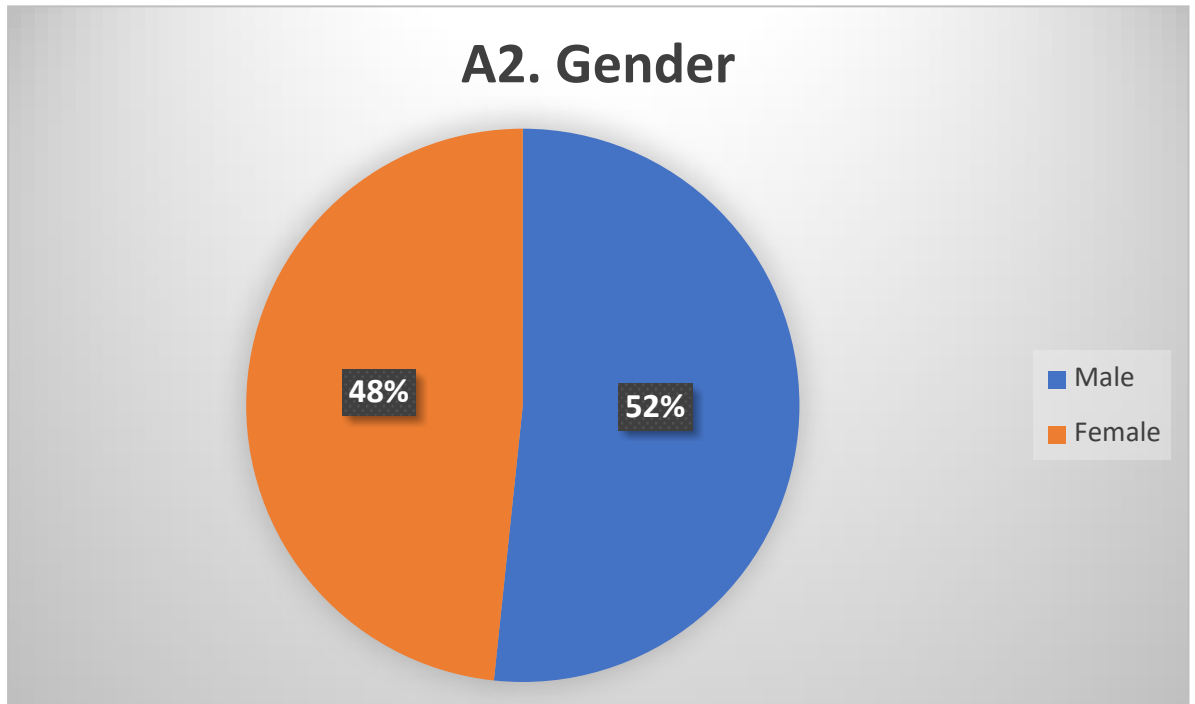


Diagram 5.2: Pie chart of respondent's gender

The diagram 5.2 shows the number of respondents from both ministry buildings based on gender. According to the data, the majority of the occupants of the building are women. Therefore, the questionnaire distributed is balanced for both men and women. Percentage for the number of male respondents are 52% equivalent to 32 respondents. Thus, the number of female respondents is 48% equivalent to 28 people. Data show that the respondents for this study are balanced, directly facilitating the researcher to analyze the findings from both parties equally.

5.2.3 ANALYSIS OF RESPONDENTS BASED ON BUILDING OCCUPANCIES.

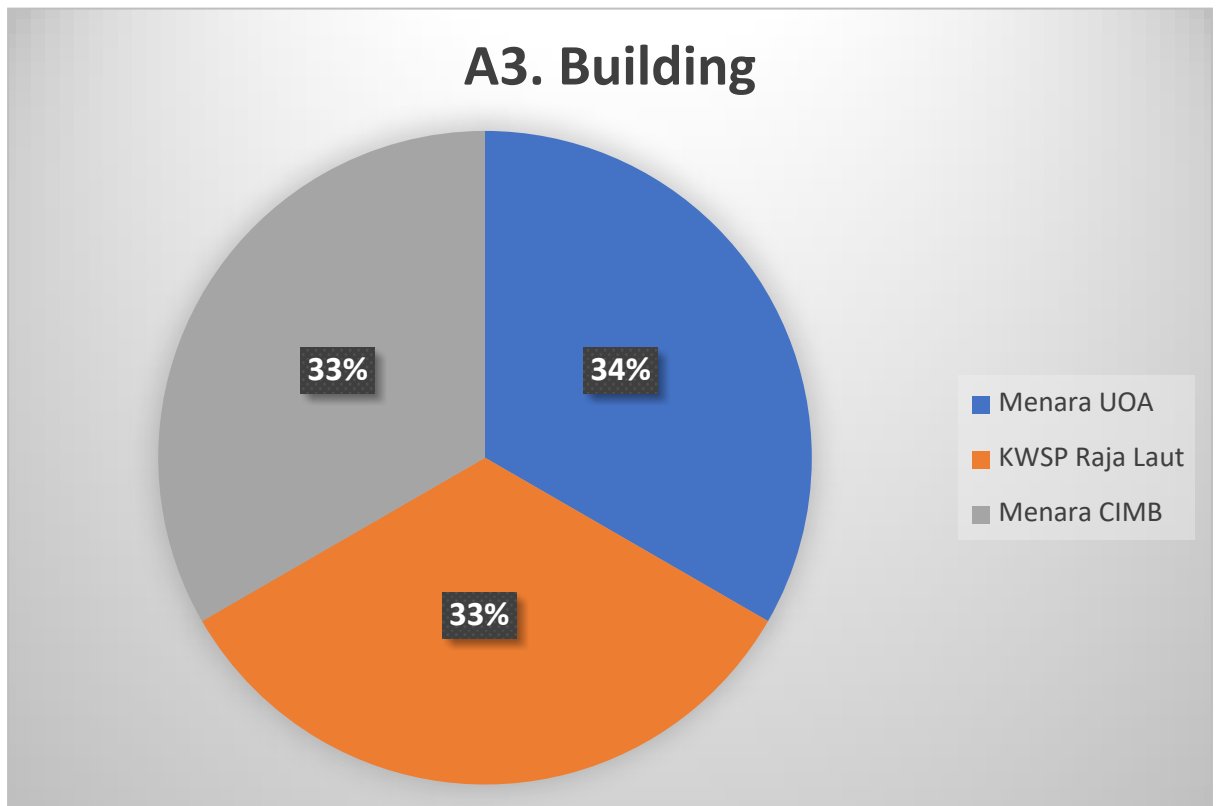


Diagram 5.3: Pie chart of respondent's building

The diagram 5.3 shows the total amount of respondents that response to the questionnaire that have been distributed. For this section, the three building have cumulate the same total of respondents for each respective building. Which overall cover about 33% for each building. The reason for the same amounts of respondents for each site is because to have an equal result for each respective buildings covering up to 20 respondents each.

5.2.4 ANALYSIS OF RESPONDENTS BASED ON WORK EXPERIENCE IN THE BUILDING

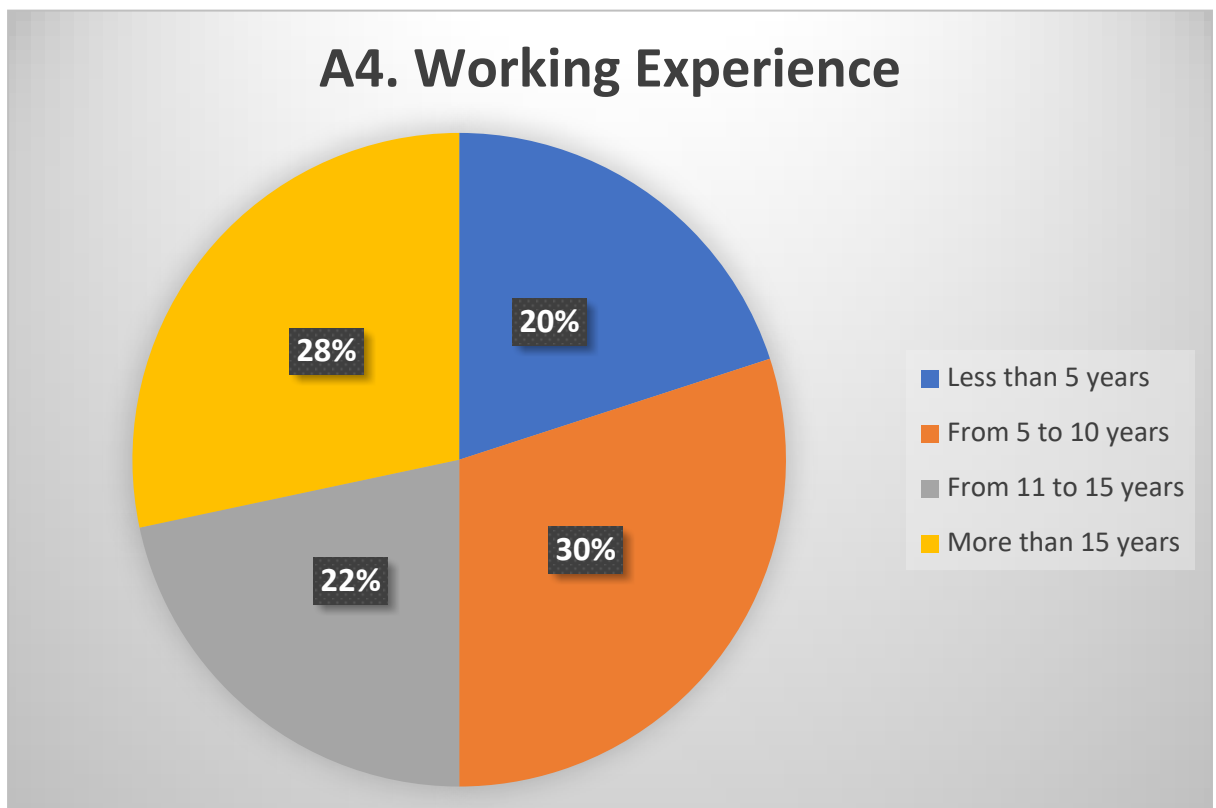


Diagram 5.4: Pie chart of respondent year in work experience

The diagram 5.4 shows the distribution of data according to the experience of respondents working in the selected buildings. The researcher selects the occupants of the building to answer the questionnaire because it plays an important role in analyzing the findings of the study. Therefore, the experience of working in a building plays a very important role in measuring and the questions and objectives of the study. The majority of respondents who answered this questionnaire had work experience between 5 to 10 years equivalent to 30%. Next 28% of respondents have work experience more than 15 years. 22% respondents have work experience between 11 to 15 years. Respondents who have less than 5 years of experience.

5.2.5 ANALYSIS OF RESPONDENTS BASED ON EDUCATION FIELD

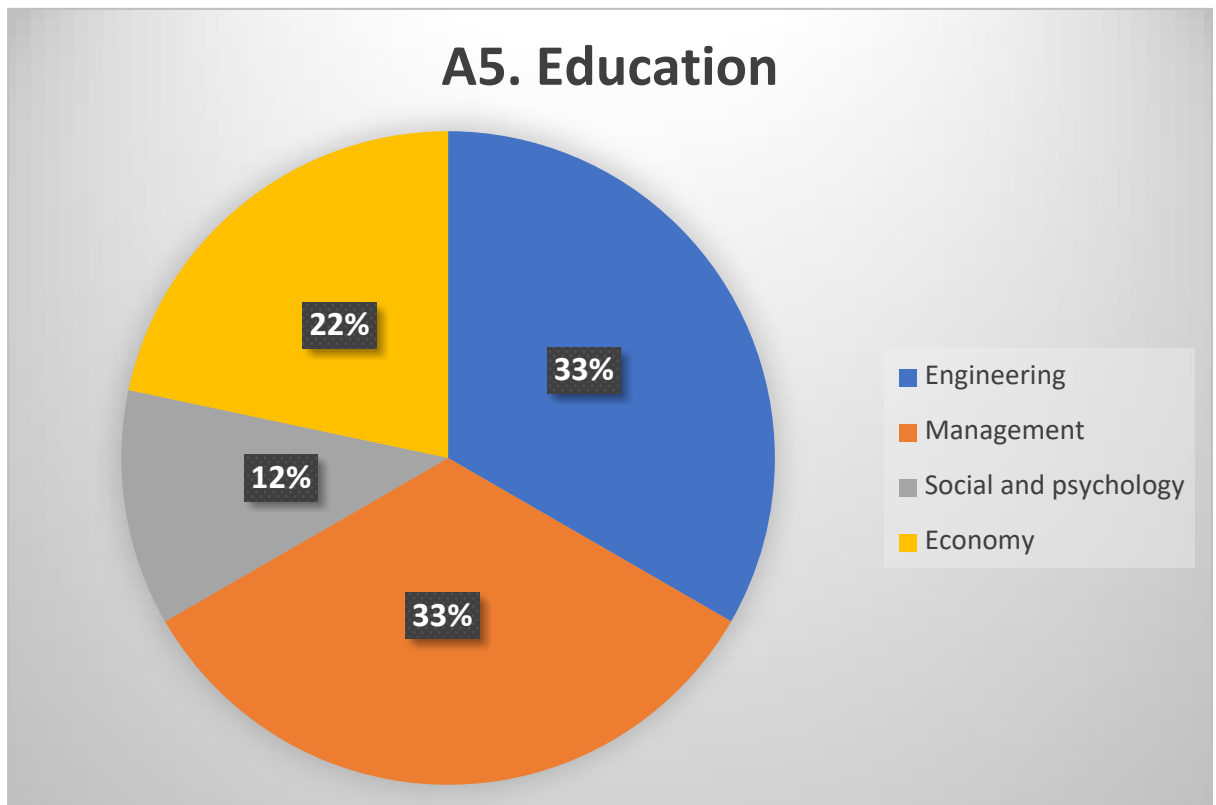


Diagram 5.5: Pie chart of respondent's education field

The diagram 5.5 shows the distribution of data according to the education field of respondents working in the selected buildings. The researcher selects the permanent occupants of the building to answer the questionnaire because it plays an important role in analyzing the findings of the study. Therefore, the experience of working in a building plays a very important role in measuring and the questions and objectives of the study. The majority of respondents who answered this questionnaire had Engineering background equivalent to 33% which have cumulate the same amount with Management background. Next 22% of respondents with Economy background. Respondents with Social and Psychology background with the lease amount, cumulate just around 12% from the total respondents.

5.2.6 ANALYSIS OF RESPONDENTS BASED ON AWARENESS ON EMERGENCY MANAGEMENT

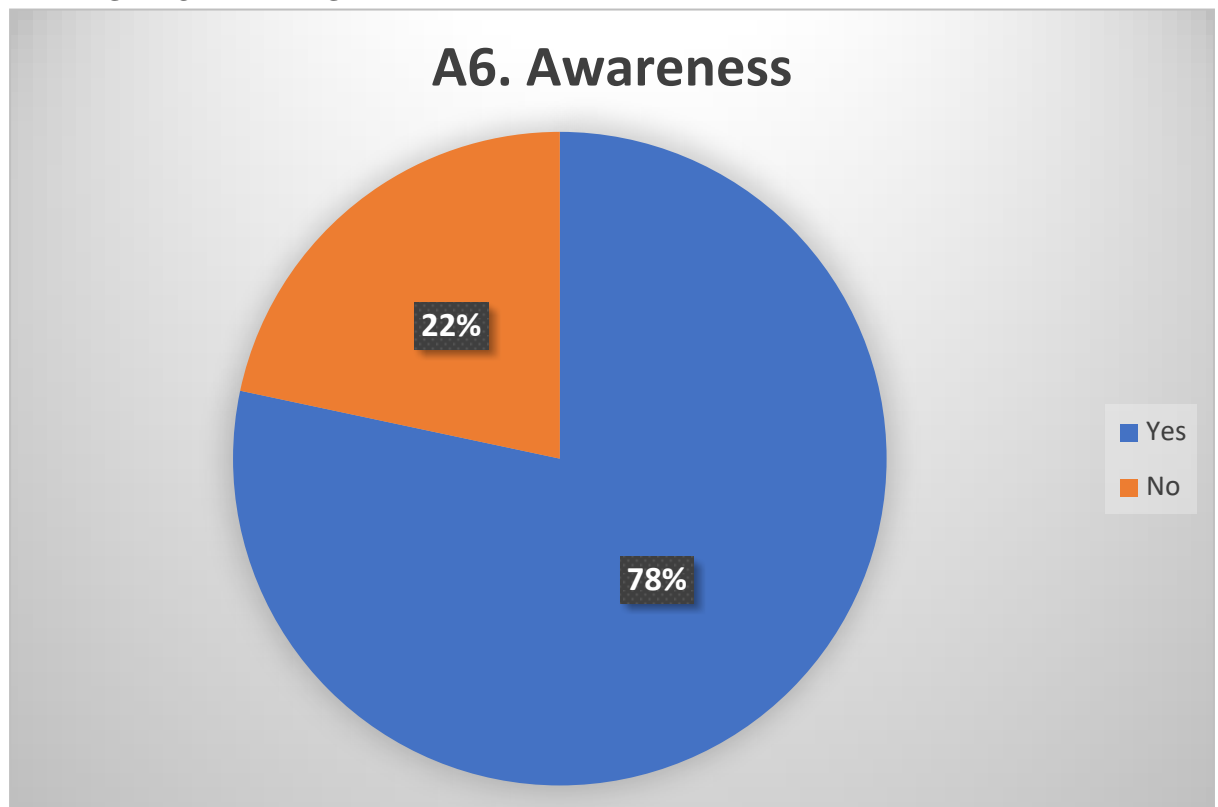


Diagram 5.6: Pie chart of respondent's awareness on emergency management

The diagram 5.6 shows the distribution of the level of awareness on emergency management in the selected buildings. Percentage for the number of respondents that are aware of emergency management are 78% equivalent to 47 respondents. Thus, the number of respondents that are not aware of emergency management is 22% equivalent to 13 people. Data show that the respondents for this study are aware of emergency management in their respected buildings.

5.3 RESEARCH FINDINGS FOR THE FIRST OBJECTIVE

This section aims for the researcher to analyze the data to achieve the first objective of the study that is to identify the critical success factor on emergency preparedness and response planning in commercial building. The data obtained through the first instrument of data collection method which is questionnaire distributed to the building occupants at each selected commercial building is categorized as quantitative data. Data obtained from questionnaires were analyzed using SPSS software.

The process of validity of the content of the variable construction was performed to achieve the first objective in the study. Thus, a more comprehensive reading, evaluation and discussion process is made of the variables in the constructs previously discussed by the researcher. Other than that, researcher used mean analysis to answer the objective. Mean is defined as the sum in the distribution divided by the actual total score. By performing a mean analysis, the researcher can identify the average value generated from a set of data. Average analysis is used for statement in the questionnaire that influences the first objective which is to identify the critical success factor on emergency preparedness and response planning in commercial building.

5.3.1 RELIABILITY ANALYSIS

Validity and reliability are two important concepts in affecting measurement and evaluation procedures (Johnson & Christensen, 2008). It is also an important element in determining the effectiveness of the data collection process. The pilot study involved the determination of the surface validity of the measuring instrument used before the test instrument used before the test measuring instrument to a group of selected study samples. Face validity is an estimate of whether a test seems to measure a criterion to be measured (Norain, 2010)

Reliability usually refers to the degree of consistency of an instrument or procedure to which it is measured. It also measures consistently and consistently (Khan, 2006). Reliability is explained by the correlation between the total score and the item score. If the data collected uses a Likert scale, then the method used to measure reliability is Cronbach Alpha. The value of this alpha coefficient exceeding 0.70, indicates that the item has high reliability and low error effect. (Gay.et. Al, 2009)

Cronbach Alpha score	Reability
0.90 – 1.00	Very good and effective with a high degree of consistency
0.70 – 0.80	Good and acceptable
0.60 – 0.70	Acceptable
<0.60	Items need to be repaired
>0.60	Items need to be dropped

Diagram 5.7: Cronbach Alpha score

With this study, the reliability of the research instrument was checked by analyzing the items in the questionnaire using SPSS program to obtain the coefficient value of the coefficient showing the Cronbach Alpha value for each construct used in the study on the critical success factor on emergency preparedness and response planning in commercial building.

In general, this section will provide an explanation to identify emergency practices, applied in those three commercial buildings in Kuala Lumpur.

No.	Statement	Sample	Mean
B1	Do you agree that emergency evacuation will be effective when actual emergency occur?	60	4.18
B2	Do you agree that tenants of the building will follow all the emergency evacuation steps according to the actual plan?	60	4.12
B3	Do you agree that contingency planning will be effective when actual emergency occur?	60	4.27
B4	Do you agree that safety inspection can provide effectiveness when actual emergency occur?	60	4.21
B5	Do you agree that incident reports and investigation will provide usefulness when contingency planning?	60	4.13
B6	Do you agree that emergency equipment will be effective when actual emergency occur?	60	4.31
B7	Do you agree that safety environment plays an important role when actual emergency occur?	60	4.24
Mean average		60	4.28

Diagram 5.8: Mean Score for Objective 1

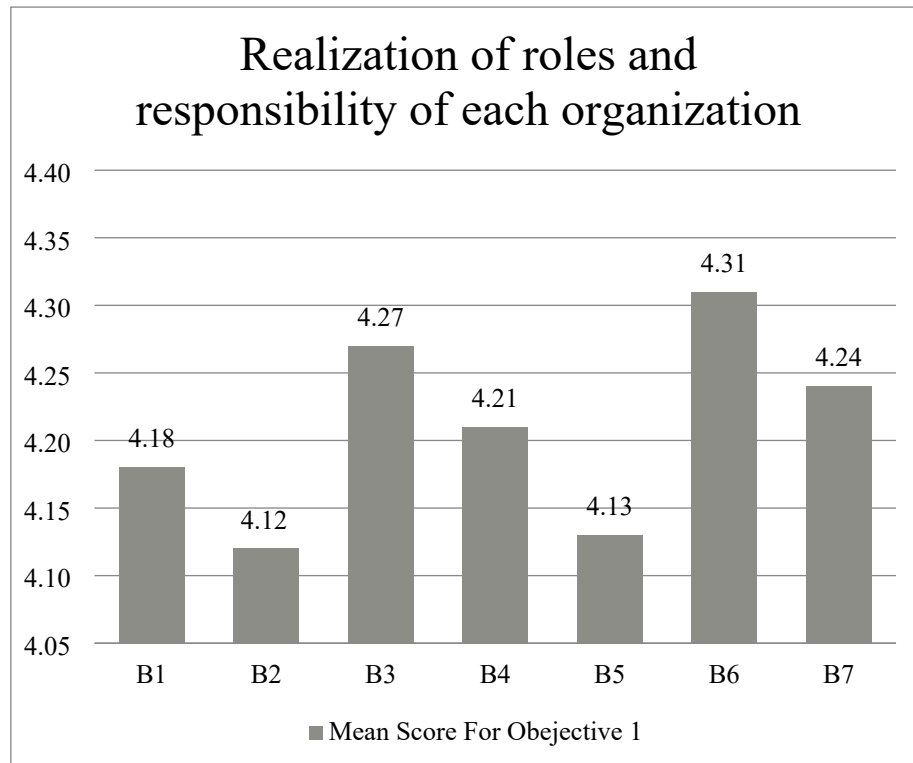


Diagram 5.9: Realization of roles and responsibility of each organization

Based on Likert's scale, the mean score that above 4.20 can be classed as strongly agree. For this construct the mean score is 4.28. Based in this questionnaire, respondent strongly agree that the realization of roles and responsibility of each organization reach its value. This is because, when the occupants in the selected building are aware of each of their roles as an occupant whenever any emergency occur. They know what to do if when emergency occur even though they are not a part of the emergency management unit. This is due to emergency safety education and training of worker have done its part to console the occupants before working at their respective buildings. For example, fire drill execution always plays an important role of educating the occupants on the safety occurrences of an emergency. When the execution runs smoothly, this will enhance the awareness of each role and responsibilities of the organization during an emergency.

No.	Statement	Sample	Mean
C1	I am very familiar with our building's evacuation plan	60	4.12
C2	It would be easy for a potentially threatening non-employee to gain access to my workplace.	60	3.94
C3	My organization has provided each employee with a basic emergency preparedness kit.	60	3.96
C4	In the event of an emergency, I am familiar with my organization's plan to continue operations from another location	60	4.07
C5	As part of our contingency plan, customers and suppliers would be able to contact us for information	60	4.16
C6	My organization has contingency plans in place so our staffs would be covered if we suffered a disaster.	60	4.26
C7	I know where the nearest emergency exits are to my desk/workstation	60	4.08
C8	My organization's emergency plan has been coordinated with local agencies, such as the fire department, hospitals, etc	60	4.45
C9	If a crisis and evacuation occurred at my organization, I am familiar with our plan on how to communicate with my fellow employees from scattered or emergency locations	60	4.16
C10	Most of our employees are familiar with my organization's emergency plan.	60	4.13
Mean average		60	4.15

Diagram 5.10: Mean Score of Objective 2

Analyzing systematic approach on diagnosing an emergencies.

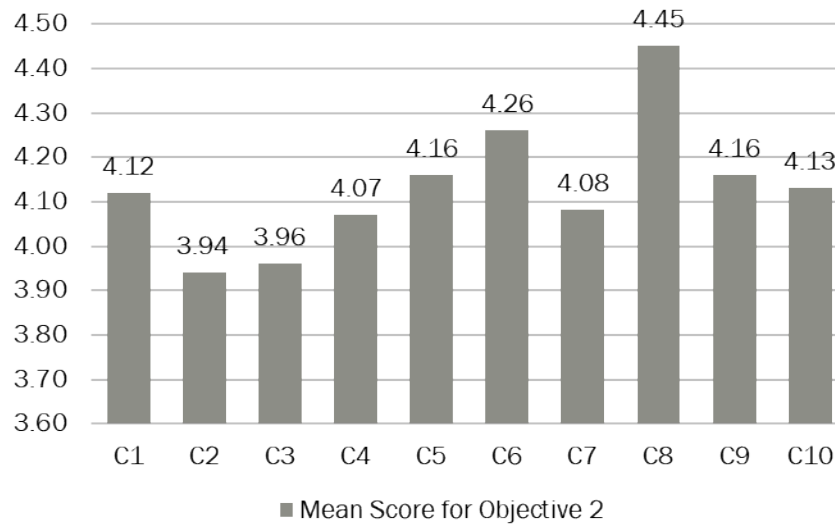


Diagram 5.11: Analyzing systematic approach on diagnosing an emergencies.

Based on Likert's scale, the mean score that above 4.20 can be classed as strongly agree. For this construct the mean score is 4.15. Based in this questionnaire, respondent agree that analyzing systematic approach on diagnosing an emergencies This is due to safety environment of the building are well fitted accordance to its safety. Safety environment such as emergency staircases or lift are present in the building.

Other than that, emergency equipment also plays an important role whenever diagnosing the systematic approach of an emergency. Fire extinguisher, wet or dry riser, fire hydrant and hose reel, all of this equipment are very well minded whenever an occurrence of an emergency start to emerge. When the execution runs smoothly, this will enhance the awareness of each role and responsibilities of the organization during an emergency.

5.3.2 RESEARCH FINDINGS BASED ON THE SECOND INSTRUMENT: SEMI STRUCTURED INTERVIEW

5.3.2.1 RESPONDENT PROFILE

Company	Name	Position	Building
Semasa Services	Kasim Ismail	Facilities Manager	Menara UOA
Semasa Services	Nur Ferlina	Facilities Manager	KWSP Raja Laut
Semasa Services	Amirul Faiz	Facilities Engineer	Menara CIMB

Diagram 5.12: Respondent Demographic

One respondent from each building was selected to conduct a semi-structured interview. Respondents are two facilities managers and one of them is facilities engineer in their respective buildings from the same facility management company. They have extensive experience in emergency management unit.

QUESTION	IMPROVEMENT/SUGGESTION
<p>1. What are the critical success factors of emergency preparedness and response planning that you think are the most crucial to implement at your site?</p>	<p>☑ Preparedness starts with preparation and establishing daily preparedness practices. Preparedness isn't something to be focused on only a few times a year to meet accreditation standards. It's a constant mindset that we need to practice.</p> <p>☑ Effective communication is the most vital component of any emergency response. Streamlined, efficient communication can help mitigate loss of life and keep responders safe. Make sure to have a tested communication plan and system in place.</p> <p>☑ Having and Emergency Safety Education and Training. Emergency response is a dynamic situation, with many shifting factors. History has shown that the success or failure of an effective response can hinge on having leaders who are prepared.</p> <p>☑ Test emergency equipment regularly with Bomba. Mass casualty and public health emergencies don't happen in silos. It's important to make sure that everyone is on the same page and that each organization knows how to coordinate with one another</p>
<p>2. How regular is your current emergency plan being tested?</p>	<p>In any emergency management, preventive planned maintenance also plays a vital role in the regulatory of equipment or tools to be inspected. Once a month will have raised the checklists of what that been inspected, such as fire extinguisher, hose reel, wet riser and so on.</p>

<p>3. What type of evaluation plan that need to be observe before the actual emergency occur?</p>	<p>The emergency plan includes:</p> <ul style="list-style-type: none"> ☐ All possible emergencies, consequences, required actions, written procedures, and the resources available. ☐ Detailed lists of emergency response personnel including their cell phone numbers, alternate contact details, and their duties and responsibilities. ☐ Floor plans. ☐ Large scale maps showing evacuation routes and service conduits (such as gas and water lines). <p>Since a sizable document will likely result, the plan should provide staff members with separate written instructions about their particular emergency response duties.</p>
<p>4. How to create such effective contingency plan?</p>	<p>Contingency plans establish the processes and procedures to protect employees, core business elements, critical processes, information systems and the environment in the event of an emergency, business disruption, or disaster. These plans should be developed to consider. Categories and types of emergencies and disasters and address the mitigation, preparedness, and response actions to be taken by employees, management, and the organizations charged with specific response and recovery tasks. These plans should contain basic guidance, direction, responsibilities, and administrative information.</p>

<p>5. What are your suggestions to increase the effectiveness of ERP in a commercial building?</p>	<p>☑ Evacuation</p> <p>Prompt evacuation of employees requires a warning system that can be heard throughout the building. Test your fire alarm system to determine if it can be heard by all employees. If there is no fire alarm system, use a public address system, air horns or other means to warn everyone to evacuate. Sound the evacuation signal during planned drills so employees are familiar with the sound.</p> <p>☑ Lockdown</p> <p>An act of violence in the workplace could occur without warning. If loud “pops” are heard and gunfire is suspected, every employee should know to hide and remain silent. They should seek refuge in a room, close and lock the door, and barricade the door if it can be done quickly. They should be trained to hide under a desk, in the corner of a room and away from the door or windows. Multiple people should be trained to broadcast a lockdown warning from a safe location.</p>
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5.4 SUMMARY

As a whole, the results of the study obtained using questionnaire instruments and semi-structured interview instruments have been analyzed in this chapter to achieve the three previously stated objectives. SPSS software helps validate the data that has been collected by the researcher. While the interviews have strengthened and provided more detailed data to achieve the objectives of the study. Data taken in the selected buildings help researchers to analyze critical success factor on emergency preparedness and response planning in commercial building. In conclusion, the researcher has obtained answers to achieve the objectives stated in chapter 1 at the beginning of the study.

CHAPTER SIX

6.0 CONCLUSION

6.1 INTRODUCTION

This chapter will describe the results of the study and finally build conclusions based on the findings of the study. This chapter is the last chapter in this study and the researcher will state comprehensively and achieve all three objectives that have been set in this study at the initial stage of the study. Furthermore, this chapter will briefly describe what will be elaborated on the research question, research implications, research limitations and conclusions as well as suggestions for improvements that can be made for future reference.

Moreover, this chapter is the last chapter of this study. All the findings of the study will be formulated to achieve the objectives that have been formed previously. The findings that have been collected as a result of mix method using questionnaire instruments and semi-structured interviews were used to analyze and discuss the objectives of the study. Therefore, this chapter will briefly and thoroughly explain the findings of the 3 research questions, research implications, research limitations and further suggestions for critical success factor on emergency preparedness and response planning in commercial building.

6.2 SUMMARY RESEARCH QUESTION FINDING

This study was conducted to figure out the critical success factor on emergency preparedness and response planning in commercial building.

6.2.1 RESEARCH QUESTION 1

What is the role and responsibility of each organization in a commercial building?

For this section, developing an Emergency Response Team (ERT) may be the best solution for each organization to be implemented. An ERT are assigned by the facility management to handle any emergency which may occur during building operation. The ERT shall provide assistance at the scene of the accident/emergency.

The roles of ERT include:

- To control or limit any effect of an on-site emergency
- To facilitate emergency response and to provide such assistance as is appropriate to the event
- To provide a communication channel with external emergency response departments
- To ensure timely communication of all vital information
- To facilitate post-emergency response activities so that normal operation can resume
- To identify improvement areas for updating the emergency procedures

6.2.2 RESEARCH QUESTION 2

What is the systematic approach to survey and diagnose an emergency?

Based on the second objective, an analysis of the study was made to analyze the systematic approach to survey and diagnose an emergency. To achieve this section is to provide a high level, strategic, unifying framework that outlines what is needed for emergency preparedness. This framework builds on previous efforts, capitalizes on current opportunities, and gives direction for stronger investment in emergency preparedness across relevant sectors and at all levels. It also responds to a number of post-event reviews that have concluded that the world is inadequately prepared for different types of emergencies, and which have recommended strengthening emergency preparedness in countries and communities worldwide.

In addition, the framework provided in the literature review enables organization to identify their roles in and contributions to emergency preparedness, and gives a grounding to inform their investments. It also points to other more detailed frameworks and tools that can help set priorities

6.2.3 RESEARCH QUESTION 3

What is the emergency process, evacuation plan and contingency plan?

To achieve the third research question, the findings discussed in chapter 5 are in the form of emergency response activities involve responding to an incident, crisis or disaster and managing that incident at the scene. Should an incident escalate to the crisis or disaster stage, a CMT should take over managing the crisis to its conclusion. If the crisis or disaster does cause damage to a company building, facility or operation, the CMT should hand over to a business continuity team the responsibility of recovery and resumption. After a disaster, it is critical that the business recovers and resumes normal (pre-event) operations as soon as possible. Customers, shareholders and stakeholders expect nothing less. Emergency management has the obligation to ensure contingency planning is properly considered and addressed within their company. The consequences of not planning for contingencies can be catastrophic with numerous liability issues.

6.3 RESEARCH IMPLICATIONS

Referring to the conceptual framework that has been built at the beginning of the study based on the literature review of previous studies, the study shows that the findings obtained can contribute a lot in various aspects. Based on the empirical evidence that has been discussed. Findings from the results of the analysis and discussions conducted have resulted in some suggestions for improvement that can be used as a reference, guidelines, considered and applied by the emergency management in the commercial building. In addition, this study can also be used as a guide to the factor on emergency preparedness and response planning in commercial building. In addition, the contribution to the contextual aspects, this study also provides contributions and implications for the following:

- Contributions to theory and model construction. Findings from the results of data analysis in this study can make a significant contribution to the efforts to strengthen the theory and highlight the literature of the study in terms of effective energy management practices practiced in the office building.
- Contribution to the formation of instruments for measuring effective energy management practices used in the Putrajaya office building. In terms methodology, this study has contributed from the aspect the formation of instruments to measure energy management methods practiced in the Putrajaya office building.

6.4 RESEARCH LIMITATION

The conclusion of this study takes into account some of the limitations of the study that exist. Among the limitations of the study faced by the researcher is to implement this study initially focused on a large number of respondents but due to constraints due to the spread of Covid-19 pandemic which makes it difficult to target a large number of respondents have made the researcher decided to reduce the number of respondents who participated in this survey.

The second limitation faced by the researcher is to receive poor feedback from respondents after submitting the survey form using the Google Form method because of the movement control order issued by the Government of Malaysia during the spread of the Covid-19 pandemic. Therefore, the researcher had to add the time set by the researcher to ensure that all the data received and analyzed are accurate.

Finally, the problems and obstacles faced by the researchers have brought the best results by obtaining the findings of the study data. All the obstacles faced by the researchers were faced with full professionalism to prepare this study. The seriousness of those who helped in the success of this study as well as the high cooperation shown has helped to complete the study and reduce the problems faced by researchers. Therefore, the researcher has successfully achieved the goals and objectives set in this study.

6.5 SUGGESTION

The researches aim is to find out the critical success factor on emergency preparedness and response planning in commercial building. Preparedness starts with preparation and establishing daily preparedness practices. Preparedness isn't something to be focused on only a few times a year to meet accreditation standards. It's a constant mindset that we need to practice.

In addition to daily preparedness practice, emergency committee also attend numerous continuing education courses to stay abreast of industry best practice and protocol changes and updates, which helped to continually prepare my mind for critical thinking in patient care. By being fully prepared to respond, we could direct all our energy and attention to the task at hand, which was vital to the outcome and safety of the patients should be served.

Other than that, Effective communication is the most vital component of any emergency response. Streamlined, efficient communication can help mitigate loss of life and keep responders safe. Make sure to have a tested communication plan and system in place.

Furthermore, emergency safety education and training should play a vital role in this matter. Emergency response is a dynamic situation, with many shifting factors. History has shown that the success or failure of an effective response can hinge on having leaders who are prepared.

Last but not least, emergency equipment must be regularly inspected to avoid any damage occur during an actual emergency. Mass casualty and public health emergencies don't happen in silos. It's important to make sure that everyone is on the same page and that each organization knows how to coordinate with one another.

6.6 SUMMARY

Overall, this study was successfully implemented because all the questions constructed by the researcher were answered perfectly. The findings of the study are based on the current situation of this study and can be utilized to the emergency management of the selected commercial building. This study also proves that effective emergency management practices can help an organization to be more aware of the emergency that might occur in the commercial building while they are working. Nowadays, effective emergency management is very important because population growth and more danger that might be occurring and addition to the virus that have been living with us since 2020. In addition, the emergency management in the commercial building in Kuala Lumpur can practice the results of discussions and suggestions that have been produced by researchers in practicing effective emergency management.

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APPENDIX



QUESTIONNAIRE FORM

CRITICAL SUCCESS FACTOR ON EMERGENCY PREPAREDNESS AND RESPONSE PLANNING IN COMMERCIAL BUILDING

I am a student from a bachelor's degree in facilities management technology with honors from the Sultan Salahuddin Abdul Aziz Shah Polytechnic conducting research on Critical Success Factor on Emergency Preparedness and Response Planning in Commercial Building.

This questionnaire was used to survey Critical Success Factor on Emergency Preparedness and Response Planning in Commercial Building. All information provided is CONFIDENTIAL and is used for survey purposes only.

This question was made to achieve the 3 objectives of the study, namely:

1. To identify the roles and responsibility of each organization in a commercial building.
2. To analyze systematic approach to survey and diagnose an emergency
3. To propose the emergency process, evacuation plan and contingency plan

SECTION A: Respondent's Demographic

Please answer following question by tick (v) in the box of your selection of answer.

A1. AGE

18-25

26-35

36-50

50 AND ABOVE

A2. GENDER

MALE

FEMALE

A3. BUILDING

MENARA UOA

KWSP RAJA LAUT

MENARA CIMB

A4. YEARS OF WORKING

EXPERIENCE

LESS THAN 5 YEARS

FROM 5 TO 10 YEARS

FROM 11 TO 15 YEARS

MORE THAN 15 YEARS

A5. EDUCATIONAL BACKGROUND

ENGINEERING

MANAGEMENT

SOCIAL AND PSYCHOLOGY

ECONOMY

OTHERS

A6. AWARENESS ABOUT

EMERGENCY PREPAREDNESS

IN YOUR ORGANIZATION

YES

NO

OTHERS

SECTION B: Identifying the roles and responsibility of each organization in a commercial building.

Please indicate your opinion to the following statements by tick (✓) at the scale box based on your experiences and knowledge.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

	SECTION B: Identifying the roles and responsibility of each organization in a commercial building.	Scale				
		1	2	3	4	5
B1	Do you agree that emergency evacuation will be effective when actual emergency occur?					
B2	Do you agree that tenants of the building will follow all the emergency evacuation steps according to the actual plan?					
B3	Do you agree that contingency planning will be effective when actual emergency occur?					
B4	Do you agree that safety inspection can provide effectiveness when actual emergency occur?					
B5	Do you agree that incident reports and investigation will provide usefulness when contingency planning?					
B6	Do you agree that emergency equipment will be effective when actual emergency occur?					
B7	Do you agree that safety environment plays an important role when actual emergency occur?					

SECTION C: Analyzing systematic approach on diagnosing an emergency.

Please indicate your opinion to the following statements by tick (✓) at the scale box based on your experiences and knowledge.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

	Section C: Analyzing systematic approach on diagnosing an emergency.	Scale				
		1	2	3	4	5
C1	I am very familiar with our building's evacuation plan					
C2	It would be easy for a potentially threatening non-employee to gain access to my workplace.					
C3	My organization has provided each employee with a basic emergency preparedness kit.					
C4	In the event of an emergency, I am familiar with my organization's plan to continue operations from another location					
C5	As part of our contingency plan, customers and suppliers would be able to contact us for information					
C6	My organization has contingency plans in place so our staffs would be covered if we suffered a disaster.					
C7	I know where the nearest emergency exits are to my desk/workstation					
C8	My organization's emergency plan has been coordinated with local agencies, such as the fire department, hospitals, etc					
C9	If a crisis and evacuation occurred at my organization, I am familiar with our plan on how to communicate with my fellow employees from scattered or emergency locations					
C10	Most of our employees are familiar with my organization's emergency plan.					

SECTION D: Emergency process, evacuation plan and contingency plan

1. What are the critical success factors of emergency preparedness and response planning that you think are the most crucial to implement at your site?
2. How regular is your current emergency plan being tested?
3. What type of evaluation plan that need to be observe before the actual emergency occur?
4. How to create such effective contingency plan?
5. What are your suggestions to increase the effectiveness of ERP in a commercial building?