

DECISION-MAKING PROCESS FRAMEWORK AT THE PLANNING PHASE OF  
HOUSING DEVELOPMENT PROJECT

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DECISION-MAKING PROCESS FRAMEWORK AT THE PLANNING PHASE OF  
HOUSING DEVELOPMENT PROJECT

NURUL ATIQAH BINTI MOHD SOFBERI

A thesis submitted in  
fulfillment of the requirement for the award of the  
Doctor of Philosophy



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MARCH 2021

I hereby declare that the work in this thesis is my own except for quotations  
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*-To my beloved mama and ayah-*

*Mohd Sofberi Ahmad and Azlina Mahmud*

*-To my dear family members-*

*Nurul Izzah, Muhammad Hafiz, Mohammad Ridzwan,*

*Nurul Mursyida, Nurul Najwa and Muhammad Iqbal Hakeemi*

*-To my supervisor-*

*Assoc. Prof. Dr. Rozlin Zainal*

*-To my shadows-*

*Ria, Ati, Fai, Nana and Sha*

*-To all my respondents-*

*Thank you so much. May Allah s.w.t reward them accordingly.*



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## ABSTRACT

Every housing development project needs to go through several procedures which consist of a decision-making process. By practising the decision-making process since the planning phase, the relevant decision-maker is assisted in analysing and organising all issues arise such as the problem in identification and selection of a suitable contractor for housing development. However, the decisions are made without knowing precisely what will happen in the future. The research's primary purpose is to develop a process model for decision-making at Malaysia's housing development planning phase. This study also examines the decision-making process practised among Malaysian private housing developers at the planning phase and classifies four main aspects of decision-making: methods, tools, criteria and information. The study then discovers whether the four main aspects (methods, tools, criteria and information) are strongly related to the decision making process. This study comprises the development of a theoretical framework by integrating the models that have been developed by numerous authors and researchers on the subject of decision making. Besides, 67 private housing developers have been chosen as respondents for a questionnaire survey in this study. The descriptive statistical analysis and the correlated analysis are conducted employing the Statistical Package for Social Sciences (SPSS). The results of this study show different findings for every four main aspects studied. However, it still answers the research objectives, and the relationship between the four main aspects of the decision-making process is accepted. This study is useful because it serves as a guide for private housing developers and governments in decision making at the planning phase of housing development. Moreover, this study provides a new process framework for decision making at the planning phase of housing development in Malaysia and assists



housing developers and governments to make better predictions before proceeding to the construction phase.



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## ABSTRAK

Setiap projek pembangunan rumah perlu melalui beberapa prosedur yang terdiri daripada proses membuat keputusan. Proses membuat keputusan yang dipraktikkan, dapat membantu pembuat keputusan menganalisis dan menyenaraikan isu-isu yang wujud sebelum sesuatu projek dibangunkan. Walau bagaimanapun, keputusan itu dibuat tanpa mengetahui dengan tepat apa yang akan terjadi pada masa hadapan. Oleh itu, kajian ini telah dijalankan bertujuan membangunkan sebuah kerangka proses untuk membuat keputusan pada fasa perancangan pembangunan perumahan di Malaysia. Kajian ini juga mengkaji proses membuat keputusan yang diamalkan oleh pihak pemaju perumahan swasta di Malaysia pada fasa perancangan dan mengklasifikasikan empat aspek utama dalam membuat keputusan iaitu kaedah, alat, kriteria dan maklumat. Kemudian kajian ini akan meneliti sama ada empat aspek berikut (kaedah, alat, kriteria dan maklumat) berkaitan dengan proses membuat keputusan. Kajian ini merangkumi pembangunan kerangka teori yang diintegrasikan oleh model-model sedia ada mengenai subjek membuat keputusan. Selain itu, 67 pemaju perumahan swasta telah terlibat sebagai responden didalam soal selidik kajian ini. Bagi menganalisis statistik deskriptif dan korelasi, perisian *Statistical Package for Social Sciences* (SPSS) telah digunakan untuk mendapatkan keputusan dari data yang dikumpul. Penemuan yang berbeza telah diperolehi dari setiap empat aspek yang dikaji. Walau bagaimanapun, penemuan berikut telah menjawab kesemua objektif kajian termasuk hubungan diantara empat aspek yang dikaji dengan proses membuat keputusan. Kajian ini berfungsi sebagai panduan kepada pemaju perumahan swasta dan kerajaan ketika membuat keputusan pada fasa perancangan pembangunan perumahan. Selain itu, kajian ini juga berjaya menyediakan satu kerangka proses membuat keputusan pada fasa perancangan pembangunan



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perumahan di Malaysia yang membantu pemaju perumahan dan pihak kerajaan membuat ramalan yang lebih baik sebelum melangkah ke fasa pembinaan.



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## LIST OF SYMBOLS AND ABBREVIATIONS

AHP	- Analytic Hierarchy Process
CPM	- Critical Path Method
IFRC	- International Federation of Red Cross and Red Crescent Societies
IRR	- Internal Rate of Return
ISO	- International Standards Organisation
JPN (NHD)	- National Housing Department (Jabatan Perumahan Negara)
KPKT	- Ministry of Housing and Local Government (Kementerian Perumahan dan Kerajaan Tempatan)
MAUT	- Multi-Attribute Utility Theory
MS Project	- Microsoft Project
NHD	- National Housing Department
NPV	- Net Present Value
PERT	- Program Evaluation and Review Technique
PI	- Profitability Index
PMBOK	- Project Management Body of Knowledge
PMI	- Project Management Institute
REHDA	- Real Estate and Housing Developers Association
RIBA	- Royal Institute of British Architects
ROC	- Rate of Cost
ROI	- Rate of Investment
ROR	- Rate of Return
SPNB	- Syarikat Perumahan Negara Berhad
SPSS	- Statistical Package for Social Sciences
SWOT	- Strength, Weaknesses, Opportunities and Threat
TCO	- Total Cost of Ownership
WBS	- Work Breakdown Structure



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## CHAPTER 1

### INTRODUCTION

#### 1.1 Background of Research



Organisations have increasingly used projects in order to reach aims and objectives while dealing with amassed difficulty, besides uncertainty, and ambiguity affecting organisations which they operate (Anbari, Bredillet & Turner, 2008). Managing projects efficiently is a primary challenge in the business world. Thus, both projects and project management have an essential role in society and have been selected as scientific research items (Marinho *et al.*, 2014). In housing development projects, the organisations or project management teams need to plan, organise, conduct, monitor, and control. It is essential to employ and apply the right tool and technique at the different project life cycle phases (Al-Hajj & Zraunig, 2018).

Housing that is decent quality and affordable (consuming less than 30% of a family income) (Rohe *et al.*, 2001; Dell *et al.*, 2004) enables families to improve their life outcomes on many aspects, such as household wealth, family stability, mental and physical health, labour market participation, educational achievement and neighbourhood quality (Rohe *et al.*, 2001; Baqutaya *et al.*, 2016). The improved physical, economic, environmental and social health is vital for lower-income

households and other underserved populations (Johnson, 2006; National Housing Department (NHD), 2017). For that reason, the private sector has been trusted to drive the country's housing industry, while the public sector serves to help facilitate the process and enhance the service delivery system of the housing industry. The public sector also emphasises developing affordable housing for the low-income group (NHD, 2018).

In developing a housing project, all developers need to go through a project life cycle (Khanna, 2011; Project Management Institute (PMI), 2013; Chitkara, 2014). The development process usually comprises the initiation phase, planning phase, construction/execution phase, control phase and close-up phase (PMI, 2013; Zainal, 2015). According to Khanna (2011), Robbins *et al.* (2011), the Royal Institute of British Architects (RIBA) (2013) and Alac (2015), the planning phase is the most crucial phase for the project success. Any development project cannot be completed with the desired quality within the specified time and allocated budget if the plan is poorly made (Rajaprasad, 2018). Planning is the second phase of the project development plan to achieve the assigned goals and specified objectives (Chitkara, 2014; Robbins *et al.*, 2017). The project plan outlines various activities and resources on the project developed based on discussion and decision-making on the current information and assessment of future trends (Chitkara, 2014).

Omar *et al.* (2009) stated that numerous alternatives arose in the planning phase, contributing to the complexities in the decision-making process. A right decision must be made as failing to do so at the planning phase will jeopardise the housing development project (Rajaprasad, 2018). Besides affecting the decision maker's business, this situation will also trouble the buyers who are forced to bear the financial burden with the bank but are likely to be frustrated because they will not be satisfied with their house. According to Berita Harian (2009), the Ministry of Housing and Local Government (KPKT) received numerous complaints about troubled projects, mostly abandoned housing inflicting financial burden on the buyer, including repayment of housing loan instalments and rental payments. Homebuyers are likely to be blacklisted by the financiers if they fail to settle the arrears of debt, which will cause difficulty for homebuyers to get a second loan facility (Abu Bakar, 2009). Therefore, this research is





conducted to help decision-makers predict better during decision-making in the construction planning phase for housing development.

Finally, as additional information, this research continues the study from Zainal (2015) regarding housing development's decision-making process. Her research focused on the initiation phase of housing development (the first phase of the project development). On the other hand, this research is on the planning phase (the second phase of the project development). Zainal (2015) has identified six main stages that decision-makers need to go through to decide the initiation phase of the housing development project. The six stages comprise exploring and asses development, evaluating development, pre-feasibility study (market assessment), preliminary investigation, development schedule (tentative development) and the feasibility study. Details on the decision-making process by Zainal (2015) can be referred to in Chapter 2 on page 58.

## 1.2 Problem Statement

According to Erdogan *et al.* (2017) and Rajaprasad (2018), the identification and selection of a suitable contractor for housing development is a crucial decision-making process, especially in the construction planning (Rajaprasad, 2018). In dealing with the long-term assets, it is crucial to select a competent contractor, which could confirm the quality of the constructed building and the completion of the project on time. The contractors should be capable of applying planned and scheduled tasks into physical actions and effectively communicating with their in-site team to follow-up the implementation of tasks on-site according to the original plan (Rajaprasad, 2018). Numerous studies showed that most of the cost and time overrun issues arose from the delays in the process of decision making by the decision-makers (such as clients, consultants, developers and contractors), and basically this happens during the planning and scheduling (Ramanathan *et al.*, 2012; Othman & Ismail, 2014; Memon, 2014; Shehu *et al.*, 2014; Ullah *et al.*, 2017). As the research aims to develop a decision making

process framework, an effective approach to selecting a contractor for the construction planning phase is automatically provided. Zainal (2015) mentioned that developing a framework or model was a suitable way to improve the decision-making process.

Jajac *et al.* (2013) and Szafranko (2017) indicated that the difficulty in choosing the location of a construction site was one of the issues in deciding the planning phase. Szafranko (2017) mentioned that the main reasons for this issue were the specific conditions of the construction industry (products/buildings were far from the location), investors' needs and attitudes, and the impact of the socio-economic to the planning process. Practising the decision-making process helps the relevant stakeholders analyse and organise all aspects of selecting the best location for the construction site from the beginning. Hence, the issue has led the research to an inference that the formation of the decision support (methods, tools, criteria and information) in the decision-making framework is necessary to improve this critical part of the construction planning phase by providing suitable and more detailed alternatives only for the planning phase (Zainal, 2015).

Other issues arise in which the classical tools and methods available for planning are not designed to handle uncertainty or respond to unexpected events. When an unexpected event occurs during planning, managers try to fix it manually, often inefficient or costly re-planning production planning schedules (Acevedo & Mejia, 2006; Alvarez, 2007). Preparation for unexpected events, such as the lack of available material, rush orders, production time variation, quality problems and faulty machines is vital to guaranteeing business continuity. Therefore, detailed planning models and decision support systems are needed to provide specific housing providers guidance (Johnson, 2006). Ignoring the management of unexpected events in planning means response times and current inventories are often excessive, while resource utilisation is low and end dates of the products cannot be controlled with precision (Palacios & Alvarez, 2007). Due to all these problems, this research comes out with a framework of the decision-making process at the housing development planning phase.

### 1.3 Research Hypothesis

A research hypothesis proposes the relationship between an independent variable and a dependent variable. The dependent variable's effect is influenced by what happens when the independent variable is changed (Lavrakas, 2008). For further understanding of the decision-making process at the planning phase, the following hypotheses were put forward in this research:

**H<sub>0a</sub>** : There is no significant relationship between decision-making methods and a decision-making process.

**H<sub>1a</sub>** : There is a significant relationship between decision-making methods and a decision-making process.

**H<sub>0b</sub>** : There is no significant relationship between decision-making tools and a decision-making process.

**H<sub>1b</sub>** : There is a significant relationship between decision-making tools and a decision-making process.

**H<sub>0c</sub>** : There is no significant relationship between decision-making criteria and a decision-making process.

**H<sub>1c</sub>** : There is a significant relationship between decision-making criteria and a decision-making process.

**H<sub>0d</sub>** : There is no significant relationship between decision-making information and a decision-making process.

**H<sub>1d</sub>** : There is a significant relationship between decision-making information and a decision-making process.



## 1.4 Research Questions

The research questions are as follows:

1. How do the Malaysian housing developers practise the decision-making process at the planning phase of housing development?
2. What the Malaysian housing developers' employed methods and tools in making decisions at the planning phase of housing development?
3. What are the main criteria and types of information required by the Malaysian housing developers in making decisions at the planning phase of housing development?
4. Are the methods, tools, criteria and information required, related to the decision-making process at the planning phase of housing development?

## 1.5 Research Aim and Objectives

This research aims to develop a framework of the decision-making process at the construction planning phase for the housing development in Peninsular Malaysia. The objectives of this research are as stated below:

1. To identify the decision-making process practised by the Malaysian housing developers at the planning phase of housing development.
2. To identify the methods and tools practised by the Malaysian housing developers in making decisions at the planning phase of housing development.
3. To determine the main criteria and types of information required by the Malaysian housing developers in making decisions at the planning phase of housing development.

4. To evaluate the relationship between methods, tools, criteria and information required in the decision-making process at the planning phase of housing development.

## 1.6 Scope of Research

This research's scope of knowledge lies under the project management discipline, which involves the decision-making process at the construction planning phase for a housing development project. Figure 1.1 shows various phases in the whole development process (Zainal, 2015), and the planning process is the second phase. According to International Federation of Red Cross and Red Crescent Societies (IFRC) (2010) and Nuruddin *et al.*, (2015), the planning phase is crucial to be perfectly prepared as it establishes the basis for all the processes when managers organise, lead and control their projects (Robbins *et al.*, 2011). Khanna (2011) and RIBA (2013) supported this statement by stating that good execution can be achieved only by excellent planning and the plan answered the what, when, how and who issues of projects.

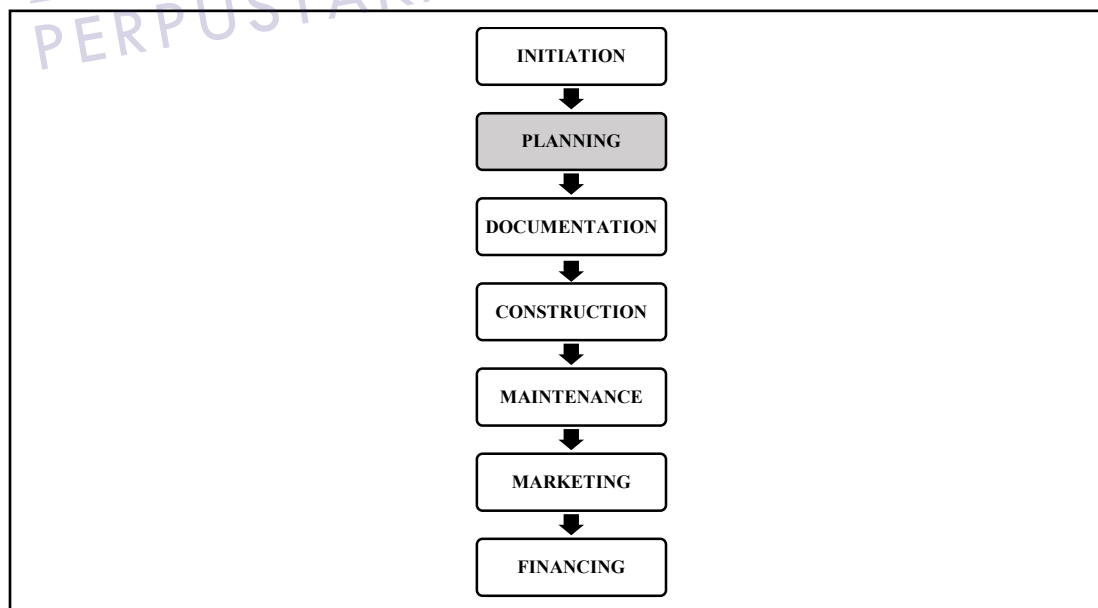


Figure 1.1: Total development process (Zainal, 2015)

Figure 1.2 shows knowledge areas of the planning phase which comprise of project scope management, project time management, project cost management, project quality management, project human resource management, project communication management, project risk management and project procurement management (PMI, 2013). Other processes and activities for decision making and planning phase are further discussed in Chapter 2.

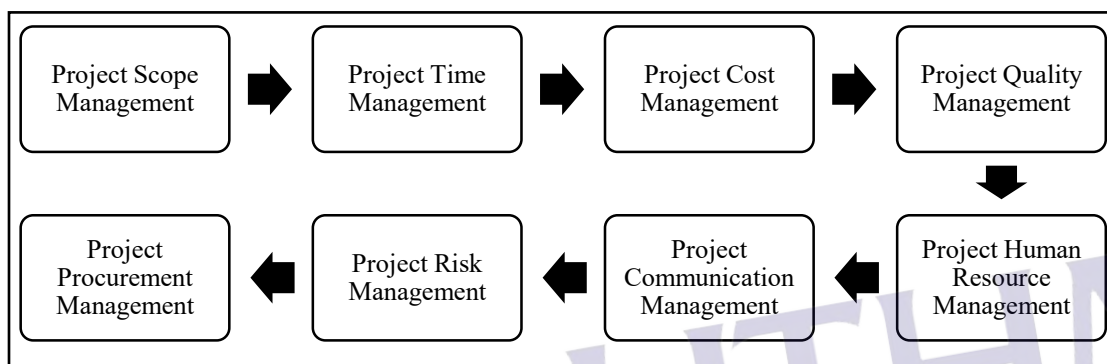


Figure 1.2: Stage of planning phase (PMI, 2013)

Additionally, this research covers all types of housing development project only in Peninsular Malaysia. There are many residential types with the common ones: bungalows, semi-detached (semi-Ds), terraces, apartments and condominium. According to Zainal (2015), private housing developers are involved in all types of housing development projects because their business's primary purpose is to make a profit since they are a business-minded party. With the right decision, losses in a project can be avoided or reduced while maximising profits. Referring to Cohen *et al.* (2007), 218 respondents are identified as a sample from the population of 1150 (Refer to Chapter 3 for a detailed explanation).

This research is limited only to private housing developers. All the private housing developers registered with the Real Estate and Housing Developers Association (REHDA) (REHDA, 2017) and the list is only available for private housing developers in Peninsular Malaysia. Developers with REHDA are relevant in this research because they are confirmed as housing developers and are basically involved in making decisions at the planning phase. Besides, this sample was selected because the private housing



developers involved with a high prospect in their work and it is crucial to determine whether they have indulged in ethical or unethical decision making for housing development (Zainal, 2015). The differences in scenarios, policies and laws of housing in Sabah and Sarawak (Zainal, 2015; KPKT, 2019) have led this research to focus only on Peninsular Malaysia. Figure 1.3 shows the area of Peninsular Malaysia.

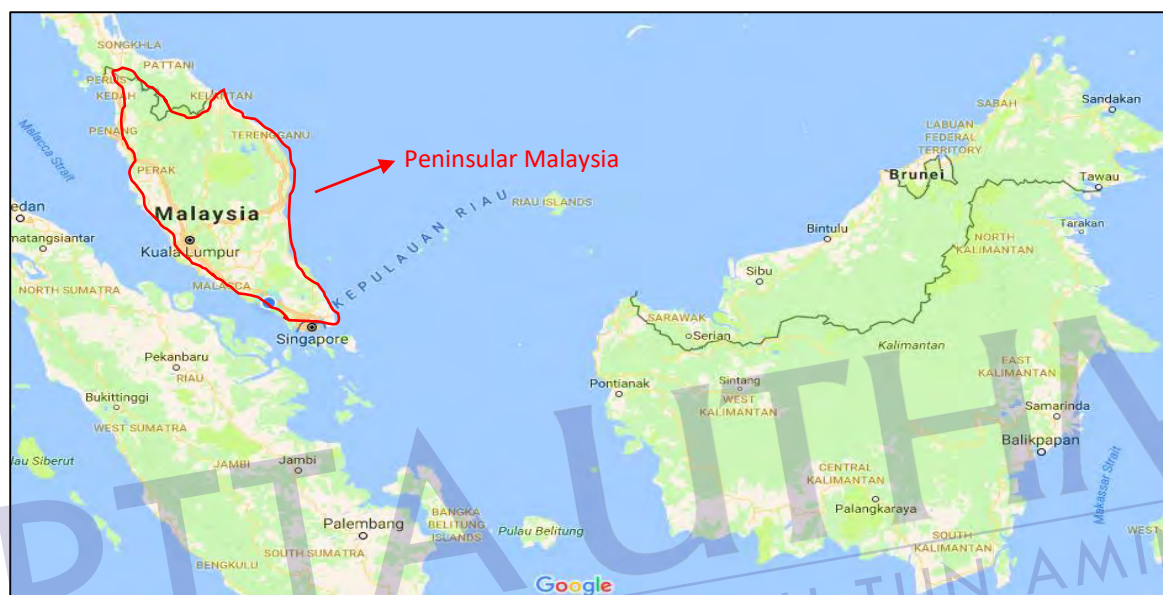


Figure 1.3: Peninsular Malaysia (Google Maps, 2019)

In order to answer this research's objectives, a questionnaire has been administered as an instrument to collect data from respondents. Questions are related to the housing developers' decision-making process, methods and tools applied and the main types of criteria and information required by them in making decisions at the planning phase of housing development. The obtained data are analysed by means of the Statistical Package for Social Sciences (SPSS) software. Descriptive analysis is conducted for the first, second and third objectives. Simultaneously, correlation analysis is used to analyse data for the fourth objective; the strength of the relationship between the decision-making process and four decision aspects (method, tool criteria and information) are determined.

## 1.7 Significance of Research

This research is essential to generate awareness among decision-makers, especially the housing developers, about the construction planning phase elements in housing development. This research is vital to help the decision-makers visualise their upcoming development project better using four main aspects (methods, tools, criteria and information) in the construction planning phase and systemised their project document. This research contributes to cost- and time-saving in the housing development project and keeps the housing quality as the final product. This study's overall importance helps the housing developers make better decisions in each stage of the housing development planning phase.

Furthermore, the governments can also improve their policy so that housing development's decision-making process becomes smooth, manageable, within the budget and specified time. Local authorities can also use the proposed framework to decide at the planning phase of housing development. In addition, this research also helps home buyers to get an affordable price for their dream house.

Finally, this research provides fundamental knowledge to academia on developing the decision-making process framework for housing development projects, mainly at the planning phase. They may improvise the framework proposed in this research as it may not necessarily be limited in Peninsular Malaysia setting. The four main aspects (methods, tools, criteria and information) in the decision-making process at the planning phase of housing development can also be expanded and discussed further.

## 1.8 Research Organisation

This research comprises of six main chapters. Chapter One generally covers the background of the study and research problems. Moreover, the research aim and objectives are developed, and the scope of the study is identified.



Chapter Two explains the decision-making process for housing development in details. This chapter also highlights the decision-making process at the planning stage. Then, the methods, tools, criteria and information practised for decision making are also discussed. Overall, the theoretical framework is set up based on the data from this chapter.

Chapter Three discusses the methodology of this research. This chapter explains the research process and ways to gather and analyse data and information.

Chapter Four covers the process of analysing data from the primary data gathered. Each research objective is nearly achieved in this chapter because results are displayed and analysed according to the priority based on stages planned in the previous chapter.

Chapter Five discusses the findings of each research objective. In this chapter, further discussion is done to conclude the decision-making process in a housing development project. The methods, tools, criteria and information required by the decision-maker are discussed further from the project scope stage until the procurement plan stage. Moreover, the relationship between the decision-making process and the four main aspects of decision making are identified. After that, the illustration of the decision-making process framework for a housing development during the planning phase is discussed.

Chapter Six summaries the research as well as provides conclusions and recommendations for future research.

## **1.9 Summary of the Chapter**

Through this chapter, the outline of this thesis is presented. It certifies the research background and emphasises the current issues in affordable housing development, followed by research problems and objectives. The research scope and its significance are addressed before the thesis organisation is outlined. This research focuses only on the decision-making process at the planning phase of housing development in Malaysia.

## CHAPTER 2

### PLANNING AND DECISION-MAKING PHASE

#### 2.1 Introduction

This chapter provides a review of the relevant literature and theories significant to this research. This chapter reviews the literature and theories for two main foundations: the decision-making and planning phase. This is done in order to clarify the content and purpose of this research. Decision-making is the process of making choices by identifying a decision, gathering information, and assessing alternative resolutions. It is an essential element when it comes to deciding the best outcome or solution for housing development and the key to project planning success. This chapter discusses the concept, method, tool, criteria, and information related to decision-making. The discussion covers a primary response to current practices of the decision-making process at the housing development planning phase.



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## 2.2 Terminology of Planning

Planning is the development of a method for converting ideas into a product or service. Projects are most successful when plans are carefully developed and prepared well in advance of the design initiation (start) (Angus *et al.*, 2003). However, Chitkara (2014) defined planning as the process of developing the project plan. The plan outlines how the project would be directed to achieve the assigned goals. It specifies a predetermined and committed future course of action, based on discussions and decisions made on the current knowledge and estimation of future trends. Planning aims to formulate a time-based plan of action for coordinating various activities and resources to achieve specified objectives (Robbins *et al.*, 2017).

A proper plan should be on the desk of anyone who intends to do some work with a specific purpose. A lousy plan or no plan can affect the purpose of the undertaken work. In plan management, managers put their experience and expertise into the planning process. The work plan or action plan should consider all the pros and cons of the work on hand and set forth elements of cost, time and quality in satisfying and acceptable manner. The plan must reflect the total scope of work, the logical sequence of the various activities for completion, resource allocation, standards, procedures, alternatives, risk factors and the possible and actual constraints (Ramakrishna, 2010).

Most studies on Malaysian housing industry focused on planning issues and their antecedents (Agus, 2002; Mohd, Ahmad & Wan Abdul Aziz, 2009; Abdullah, Harun & Abdul Rahman, 2011; Mohd & Alias, 2011; Zainal, 2015). Marzuki (2015) stated that regardless of the vast diversity of planning fields, planning generally was organising activities within a framework to achieve the desired goal. The United States Planning Association (Stiftel, 1990) defines planning, more specifically, as a comprehensive, coordinated and continuing process to help public and private decision-makers arrive at decisions that promote society's common good to achieve particular objectives (Robbins *et al.*, 2017). Chadwick (1971) viewed the planning process as a process of human thought and action based upon that thought-in point of fact, forethought, thought for the future, which was a very general human activity. For this research, planning is defined

as activities or framework of developing a project plan in order to achieve the objectives established.

### **2.3 Planning Phase in the Construction Project Management**

According to the Project Management Institute (PMI) (2013), project management applies knowledge, skills, tools, and techniques to a broad range of activities to meet a particular project's requirements. There are five phases of project management's life cycle, shown in Figure 2.1 on page 15, which included planning phase at the second place (Egan, 2006; PMI, 2013; Chitkara, 2014). University of New Hampshire (2017) stated that the Plan Phase builds on information captured in the initial phase and is traditionally considered the most crucial phase. A project team is assigned to define the project scope fully, refine requirements, create the technical design, task list, resource plan, communications plan, budget, schedule, and deliver a project plan. The project plan will include a detailed breakdown and assignment of each project's task, from beginning to end. Performance measures, risk assessment, and change management plans will also be well-defined. The working process is defined, team members are identified, and reporting frequency and channels are established.

In a construction project, work is divided into phases to make sure it is easy to control. A typical construction project consists of four phases: project concept analysis phase, planning and construction procurement phase, construction (execution and control) phase and close-up (including demobilisation) phase (Egan, 2006; PMI, 2013; Chitkara, 2014). These phases are usually sequential but may overlap in some situations (PMI, 2013; Chitkara, 2014). The planning phase is the second phase of construction project management, as shown in Figure 2.1 and Figure 2.2.

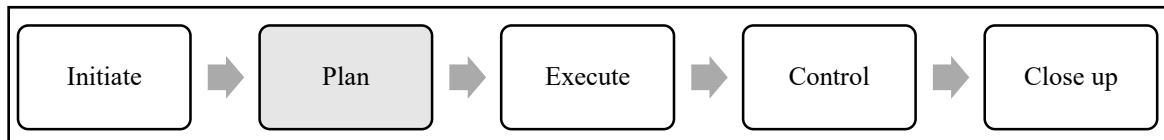


Figure 2.1: Five phases of the project management life cycle (Egan, 2006; PMI, 2013; Chitkara, 2014)

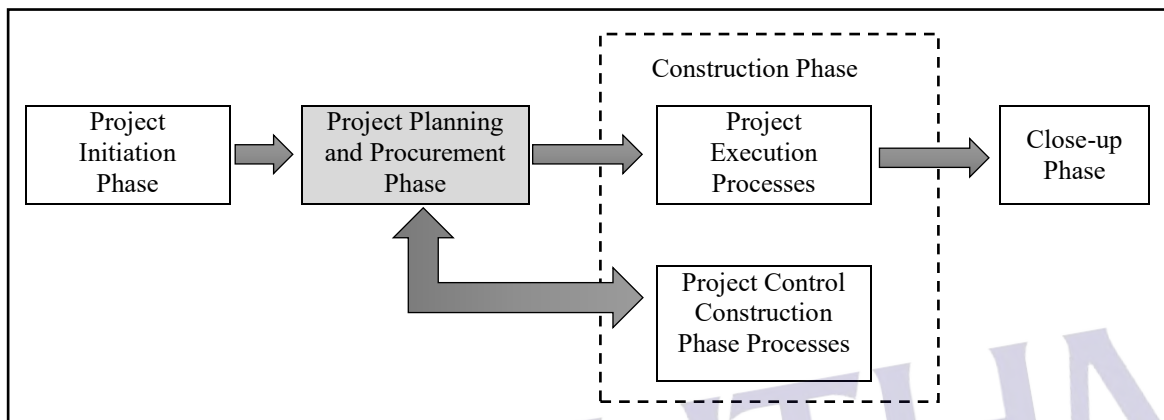


Figure 2.2: Planning project management phases (Chitkara, 2014)

The planning phase, which PMI labels “organising and preparing,” includes more detailed schedules and a budget. The planning also includes developing detailed staffing, procurement, and project controls plans. The planning phase emphasises how the project will be executed and a plan to acquire the resources needed to execute it. Although much of the planning activity occurs during the planning phase, the project plan continues to be adjusted to respond to new challenges and opportunities. Planning activities occur during the project’s entire life (PMI, 2013; Chitkara, 2014).

As stated by PMI (2013), project management applies knowledge, skills, tools, and techniques to a broad range of activities to meet a particular project’s requirements. There are five phases of project management, and if the lifecycle provides a high-level view of the project, the phases are the roadmap to accomplishing it, as shown in Table 2.1.

Table 2.1: Five phases of project management (PMI, 2013)

1) Project Conception and Initiation	2) Project Definition and Planning	3) Project Launch or Execution	4) Project Performance and Control	5) Project Close
Project charter  Project initiation	Scope and goal setting  Budget Work Breakdown Structure  Gantt chart  Communication plan  Risk management	Status and tracking  Key Performance Index (KPI)  Quality  Forecasts	Objectives  Quality deliverables  Effort and cost tracking  Performance	Post mortem  Project punch list  Reporting

#### 2.4 Planning Phase in Malaysian Housing Development

The housing development process involves three main stages (Mohd & Alias, 2011). The process begins with the pre-development process (planning phase), followed by the construction and post-construction phases. Every phase involves various activities and processes, yet, the most crucial part is the planning phase. The pre-development phase's most crucial process is the approval application for the proposed development (Ball, 2010; Mohd *et al.*, 2009). A developer must first obtain all the planning approvals before any physical work can begin on the site, and before issuance of any advertising permitted by the relevant authorities (Abdullah *et al.*, 2011); due to the thorough assessment by various departments, this process can be quite time-consuming (Yaakup *et al.*, 2003). Maruani & Cohen (2011) also recognised the value of proper planning and control in housing development processes because this was a central factor in determining housing supplies' type and size. Consistent with this idea, White & Allmendinger (2003) remarked that government interventions in housing planning positively and negatively impacted housing development. Similarly, Mohd *et al.* (2009) also indicated that the planning system was an essential factor that significantly influences Malaysia's housing supply.

Housing development in Malaysia requires developers to undergo various procedures before the project may begin. In summary, several researchers (Goh, 1997; Jaafar, Abdul Aziz & Sahari, 2009; Wan Mohd Dzulkifli, 2009) have identified the activities customarily conducted by housing developers in Malaysia: purchasing of land, land-use conversion and subdivision, preparation of various plans, such as subdivision, earthwork, layout, building, engineering and landscape, approval of various plans, obtaining advertising and marketing permits, construction and issuance of the certificate of fitness.

Apart from those activities, some developers may need to obtain bridging loans from financial institutions, followed by preparation of legal documents by lawyers including the sale and purchase agreement signed by the purchasers, once the project is launched in the market (Tong, 2012). The fundamental procedures involved in developing and marketing housing projects in Malaysia are numerous and perceived as burdensome. Malaysian housing developers are thus required to act within the legislative frameworks designed by the government authorities as well as take on the inherent risks in dealing with property development (Mohd, Ahmad & Wan Abdul Aziz, 2009).

## **2.5 Planning Phase Processes and Activities**

According to Angus *et al.* (2003), each phase is subdivided into activities with one group of activities per phase. An activity is an active process, such as searching, learning, doing, or writing, which involves applying mental and physical energy. Each activity is further subdivided into smaller, more manageable steps or components until the deliverable products and documents are defined in enough detail to allow better management control.

Chitkara (2014) also stated that each phase of project management consisted of a single or a group of processes or activities. A process is an action or a set of actions performed to bring the desired result. Each process provides inputs which are processed using tools and techniques to produce outputs. Based on Chitkara (2014), processes in



the planning phase include designs and drawings planning, time planning, resource planning, cost planning and budgeting, communications planning, quality assurance planning, organisational planning, construction contracts procurement planning, resources mobilisation planning, site administration and layout planning, workers safety, health and environment protection plan and lastly, risk response planning. The process is shown in Figure 2.3.

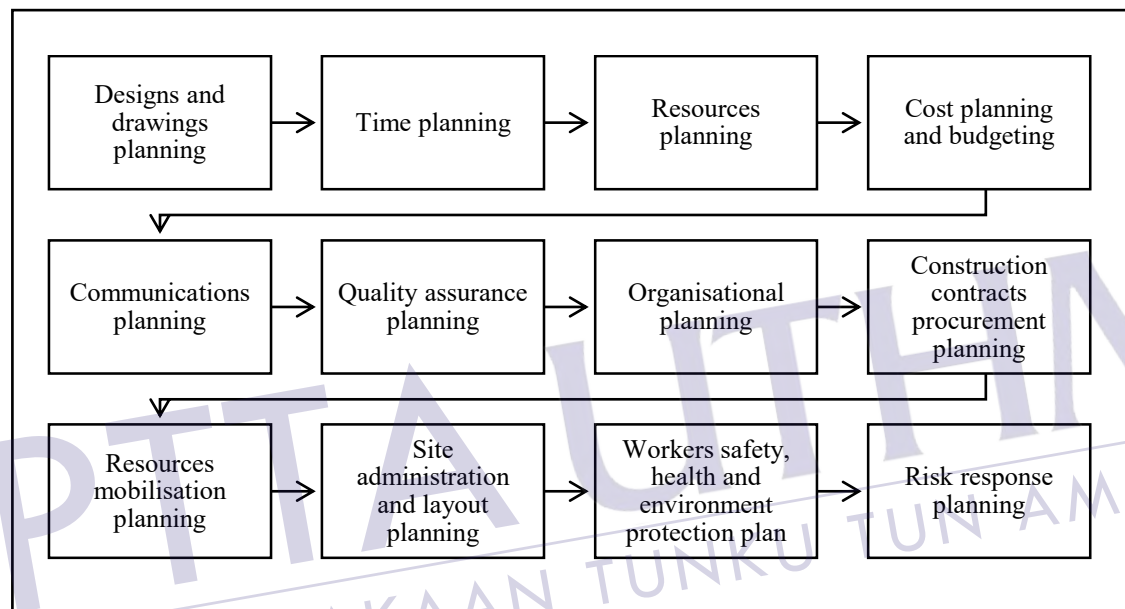


Figure 2.3: Planning process (Chitkara, 2014)

The project planning phase is the second phase of the project management process. It involves creating plans to guide the organisation through the project's execution and closure phases. During this phase, the plans will help in time management, cost, quality, change, risk, and issues. An accurate plan will also help manage staff and external suppliers and ensure that the project is delivered on time and within budget. Bowen (2015) mentioned that it was essential not to skip any of these stages to keep the project from failing. For example, if the initiation stage was skipped to the execution stage without effectively planning the project, this triggered mistakes, the unorganised dan fall-apart projects. Ten project planning steps must be taken to complete the project planning phase efficiently (Turner, 2014). The steps are shown in Figure 2.4.



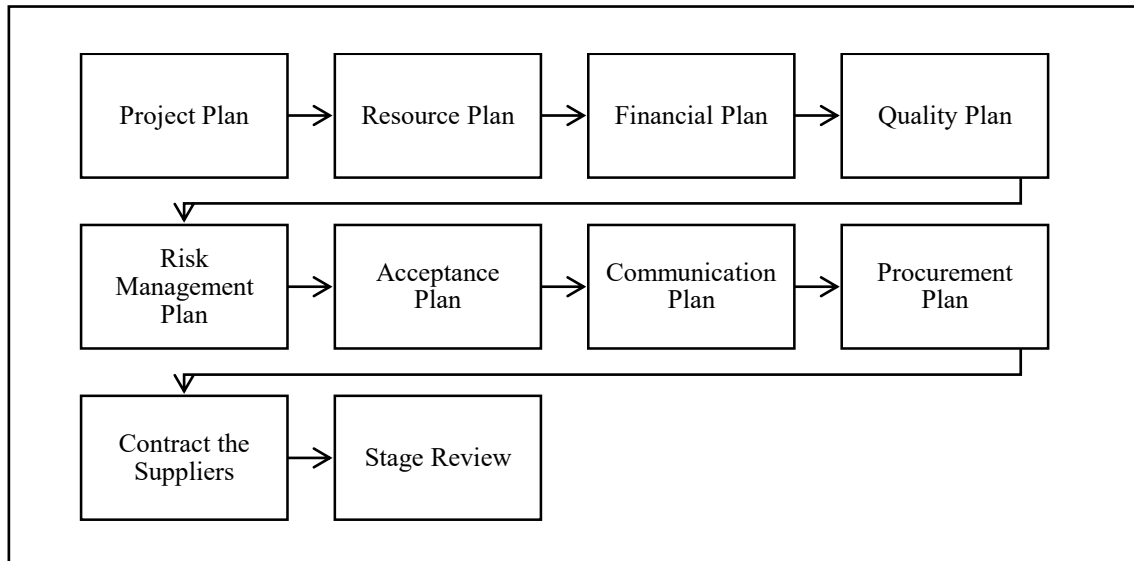


Figure 2.4: Stage of planning phase (Turner, 2014)

Duncan (1993) in PMI (2013) agreed that planning was vital in a project. Therefore, there are relatively more detailed processes in this section. However, the number of processes does not mean that project management is primarily planning; planning should always be commensurate with the project's scope. The relationships among the project planning processes are shown in Figure 2.5. These processes are subject to frequent iterations before completing the plan. For example, if the initial completion date is too late, the project scope may need to be reduced, or the costs increased.

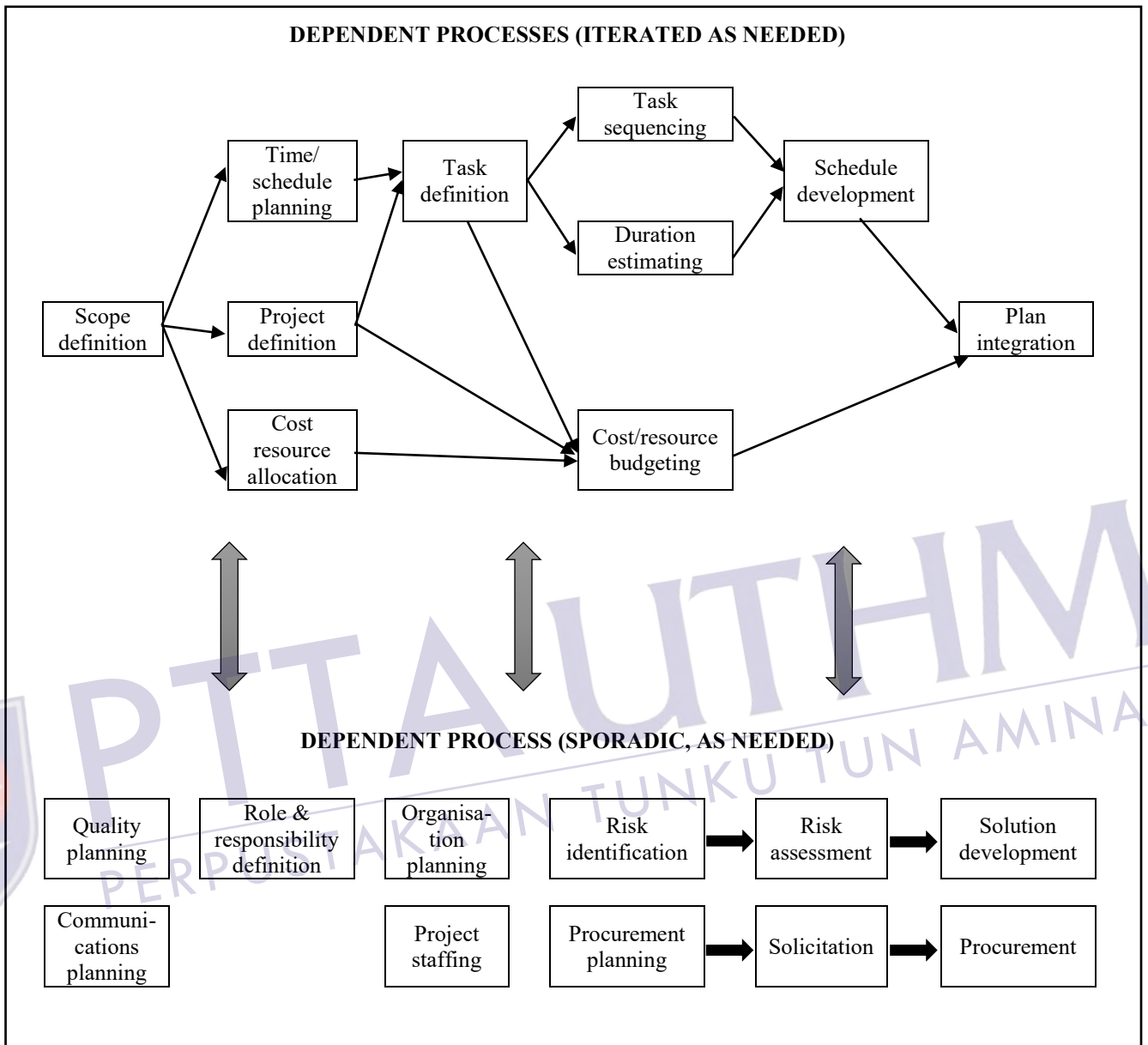


Figure 2.5: Detail planning phase relationship (PMI, 2013)

A project management plan is developed comprehensively by individual plans for cost, scope, duration, quality, communication, risk and resources. Some of the essential activities that mark this phase are making work-breakdown structure (WBS), developing a schedule, milestone charts, Gantt charts, estimating and reserving resources, planning dates, and communication modes with stakeholders based on milestones, deadlines and important deliveries. A plan for managing identified and unidentified risks is determined as this may affect aspects of a project later on. Risk management planning includes risk identification and analysis, risk mitigation approaches, and risk response planning (Pathak, 2016).

As shown in Table 2.2, seven taskbars replace the 'description of key tasks' in the RIBA Outline Plan of Work 2013, focusing on 3 out of 8 stages: Concept Design, Developed Design and Technical Design. Some taskbars are fixed, some are variable (containing options specific to a practice or project-specific Plan of Work), and others are selectable (capable of being 'switched' on or off). The fixed bars ensure consistency across all RIBA Plan of Work 2013 documents. The ability to switch certain taskbars on or off and to vary the content of others provides a flexible 'kit of parts' that can be used to produce a focused and demonstrate practising or project-specific version via the RIBA Plan of Work 2013 Online. Planning applications are typically made using the Stage 3 (Developed Design) output. A demonstrate RIBA Plan of Work 2013 will identify when the planning application is to be made. The strategic difference is that in the RIBA Plan of Work 2013, the Developed Design will be coordinated and aligned with the cost information by the end of Stage 3. This process does not increase the amount of design work required, but extra time is needed to review the information and implement any changes that arise from the comments made before all the outputs are coordinated prior to the information exchange at the end of Stage 3.



Table 2.2: RIBA Plan of work 2013 for the planning phase (RIBA, 2013)

Stages	2. CONCEPT DESIGN	3. DESIGN DEVELOPMENT	4. TECHNICAL DESIGN
<b>Core Objectives</b>	Preparing Concept Design, including outline proposals for structural design, building services systems, outlining specifications and preliminary Cost Information, and relevant Project Strategies following Design Programme. Agreeing with alterations to brief and issue Final Project Brief.	Preparing Developed Design, including coordinated and updated proposals for structural design, building services systems, outlining specifications, Cost Information and Project Strategies following Design Programme.	Preparing Technical Design following Design Responsibility Matrix and Project Strategies to include all architectural, structural and building services information, specialist subcontractor design and specifications, following Design Programme
<b>Procurement</b>	The procurement strategy does not fundamentally alter the design progression or the level of detail prepared at a given stage. However, Information Exchanges will vary depending on the selected procurement route and Building Contract. A bespoke RIBA Plan of Work 2013 will set out the specific tendering and procurement activities at each stage concerning the chosen procurement route.		
<b>Programme</b>		Reviewing Project Programme	The procurement route may dictate the Project Programme and may result in certain stages overlapping or being undertaken concurrently. A bespoke RIBA Plan of Work 2013 will clarify the stage overlaps. The Project Programme will set out the specific stage dates and detailed programme durations. (until construction phase)
<b>(Town) Planning</b>			Planning applications are typically made using the Stage 3 output. A bespoke RIBA Plan of Work 2013 will identify when the planning application is to be made.
<b>Suggested Key Support Tasks</b>	Preparing Sustainability Strategy, Maintenance and Operational Strategy and reviewing Handover Strategy and Risk Assessments. Undertaking third party consultations as required, and any Research and Development aspects. Reviewing and updating the Project Execution Plan. Considering Construction Strategy, including offsite fabrication, and develop Health and Safety Strategy.	Reviewing and updating Sustainability, Maintenance and Operational and Handover Strategies and Risk Assessments. Undertaking third party consultations as required and conclude Research and Development aspects. Reviewing and updating the Project Execution Plan, including Change Control Procedures. Review and update the Construction and Health and Safety Strategies.	Reviewing and updating Sustainability, Maintenance and Operational and Handover Strategies and Risk Assessments. Preparing and submitting Building Regulations submission and any other third party submissions requiring consent. Reviewing and updating the Project Execution Plan. Reviewing Construction Strategy, including sequencing, and updating the Health and Safety Strategy
<b>Sustainability Checkpoints</b>	Concept Design including outline structural and building services design, associated Project Strategies, preliminary Cost Information and Final Project Brief	Developed Design, including the coordinated architectural, structural and building services design and updated Cost Information	Completed Technical Design of the project
<b>Information exchanges</b>	Required	Required	Not required

According to PMI (2013), the planning process group consists of those processes that are performed to establish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives. The planning processes develop the project management plan and the project documents used to carry out the project. The complex nature of project management requires the use of repeated feedback loops for additional analysis. Significant changes, occurring throughout the project life cycle, trigger a need to revisit one or more of the planning processes and possibly some of the initiating processes. This progressive detailing of the project management plan is called progressive elaboration; this indicates that planning and documentation are iterative and ongoing activities. The key benefit of this process group is to outline the strategy and tactics as well as the course of action or path to complete the project or phase successfully. When the planning process group is well managed, it is much easier to get stakeholder engagement.

The project management plan and project documents developed as outputs from the planning process group will explore all aspects of the scope, time, cost, quality, communications, human resources, risks, procurements, and stakeholder engagement. Updates arising from approved changes during the project (generally during monitoring and controlling processes and during the direct and manage project work process) may significantly impact parts of the project management plan and the project documents (PMI, 2013). Updates to these documents provide greater precision with respect to schedule, costs, and resource requirements to meet the defined project scope (PMI, 2013).

Table 2.3 provides an overview of the project integration management processes. These processes interact with each other. Project integration management is necessary for situations where individual processes interact. For example, a contingency plan's cost estimate involves integrating the project cost, time, and risk management knowledge areas. When there are additional risks, various alternatives are identified, then one or more of those processes may be revisited.

Table 2.3: Project management process group (PMI, 2013)

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
<b>Project Integration Management</b>	Developing Project Charter	Developing a Project Management Plan	Directing and Managing Project Work	Monitoring and Controlling Project Work, Performing Integrated Change Control	Closing Project or Phase
<b>Project Scope Management</b>		Planing Scope Management, Collecting Requirements, Defining Scope, Creating WBS		Validating Scope, Controlling Scope	
<b>Project Time Management</b>		Planing Schedule Management, Defining Activities, Sequencing Activities, Estimating Activity Resources, Estimating Activity Durations, Developing Schedule		Controlling Schedule	
<b>Project Cost Management</b>		Plan Cost Management, Estimate Costs, Determine Budget		Controlling Costs	
<b>Project Quality Management</b>		Planning Quality Management	Performing Quality Assurance	Controlling Quality	
<b>Project Human Resource Management</b>		Planning Human Resource Management	Acquiring Project Team, Developing Project Team, Managing Project Team		
<b>Project Communications Management</b>		Planning Communications Management	Managing Communications	Controlling Communications	
<b>Project Risk Management</b>		Planning Risk Management, Identifying Risks, Performing Qualitative Risk-Analysis, Performing Quantitative Risk Analysis, Planning Risk Responses		Controlling Risks	
<b>Project Procurement Management</b>		Planning Procurement Management	Conducting Procurements	Controlling Procurements	Closing Procurements
<b>Project Stakeholder Management</b>	Identifying Stakeholders	Planning Stakeholder Management	Managing Stakeholder Engagement	Controlling Stakeholder Engagement	

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