THE IMPLEMENTATION OF PROJECT MANAGEMENT PROCESSES AND ITS RELATIONSHIP WITH PROJECT SUCCESS IN THE MALAYSIAN INTERIOR DESIGN SECTOR

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ABSTRACT

The work of an interior designer revolves around the design, construction and management of the project. Therefore, the knowledge and understanding with regards to project management, technicality and system of work is required in order to deliver projects successfully. However, existing literature shows insufficient documented knowledge and information with relation to the implementation of project management processes in interior design projects. The basic attention of available literature on this topic is mostly directed towards specific issues faced in the lifetime of interior design projects with studies on its possible solutions, but very little information has been found on the overall management of these projects to curb those issues. The review of literature also exposed a lack of information and research with relation to project management in the interior design sector and its relationship with project success. Thus, the aim of this research is to study the implementation of project management processes in interior design projects and its relationship to project success. The research approach adopted in this study is the deductive approach whereby the theory is established first through an extensive literature review before empirical research and analysis is based on quantitative data collected from 86 interior design professionals using an online questionnaire survey. It is anticipated that this study will establish the implementation of project management processes in interior design projects in Malaysia as well as assist in proving the importance and contribution of project management in influencing interior design project success, and later, identifying potential opportunities of interior design management.

Keywords: project management, interior design, success measure

PELAKSANAAN PROSES PENGURUSAN PROJEK DAN HUBUNGANNYA DENGAN KEJAYAAN PROJEK DALAM SEKTOR REKA BENTUK DALAMAN MALAYSIA

ABSTRAK

Hasil kerja pereka bentuk dalaman merangkumi aktiviti rekaan, pembinaan dan pengurusan projek. Oleh itu, pengetahuan dan pemahaman berkaitan dengan pengurusan projek, aspek teknikal dan sistem kerja diperlukan untuk menyampaikan projek dengan berjaya. Walau bagaimanapun, literatur yang ada menunjukkan pengetahuan dan maklumat yang tidak mecukupi berkaitan dengan pelaksanaan proses pengurusan reka bentuk dalaman. Sebahagian besar literatur sedia ada mengenai topik ini ditujukan kepada isu-isu khusus yang dihadapi dalam jangka masa projek reka bentuk dalaman dengan kajian yang hanya memberi fokus terhadap penyelesaian yang mungkin, tetapi hanya sedikit maklumat ditemui mengenai keseluruhan pengurusan projek untuk membendung masalah tersebut. Kajian literatur juga memperlihatkan kekurangan maklumat dan penyelidikan berkaitan dengan pengurusan projek dalam bidang reka bentuk dalaman dan hubungannya dengan kejayaan projek. Oleh itu, tujuan penyelidikan ini adalah untuk mengkaji pelaksanaan proses pengurusan projek dalam projek reka bentuk dalaman dan hubungannya dengan kejayaan projek. Pendekatan penyelidikan yang telah digunakan dalam kajian ini adalah pendekatan deduktif di mana sesuatu teori didirikan terlebih dahulu melalui tinjauan literatur yang sistematik sebelum penyelidikan dan analisis empirik berdasarkan data kuantitatif yang dikumpulkan dari 86 profesional reka bentuk dalaman menggunakan tinjauan soal selidik dalam talian. Kajian ini djangka akan mengenal pasti proses pelaksanaan pengurusan projek dalam projek reka bentuk dalaman di Malaysia serta membantu membuktikan kepentingan dan sumbangan pengurusan projek dalam mempengaruhi kejayaan projek reka bentuk dalaman dan kemudian pula, mengenal pasti potensi peluang pengurusan reka bentuk dalaman.

Kata kunci: pengurusan projek, reka bentuk dalaman, ukuran kejayaan

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

BIID	British Institute of Interior Design
CSF	Critical success factors
FF&E	Furniture, fitting and equipment
ID	Interior Design
KPIs	Key Performance Indicators
LAM	Lembaga Arkitek Malaysia / Board of Architects Malaysia
MIID	Malaysian Institute of Interior Designers
MSID	Malaysian Society of Interior Designers
NCIDQ	National Council for Interior Design Qualification
PM	Project Management
PMBOK	Project Management Book of Knowledge
PMPA	Project Management Performance
PSC	Project success criteria
RIBA	Royal Institute of British Architects
RO	Research Objective
RQ	Research Question
SPSS	Statistical Package for the Social Sciences

LIST OF APPENDICES

CHAPTER 1: INTRODUCTION

1.1 Introduction

This chapter will elaborate the outline of this research. It will begin with presenting the research background which provides a general explanation and an overview on the main topic that will be discussed throughout the study. Then, the problem statement is presented in which issues related to the management of interior design projects and project success are explained. Following that, research aim, objectives and questions will be described followed by the research methodology that is adopted in this study. Besides that, the significance of the study will be outlined. Lastly, this chapter will end with a brief explanation on the structure of the subsequent chapters.

1.2 Research Background

Interior design can be defined as the art and science of designing interior spaces to make it aesthetically pleasing and ergonomically suitable for the people using the space. Lin (2020) states that design is a problem-solving process and interior design is a major contributing factor when it comes to building design quality. Hazim (2017) describes that an interior designer's work is concerned with the basic organization of spaces that consist of both technical as well as aesthetic elements, just as practiced in architecture but with an emphasis on spaces within a building. To put it in a simpler manner, interior design is about internal or interior spaces and environments and the success of an interior design project is determined based on the extent to which the user's needs and desires have been met (Karaaslan & Yazıcıoğlu, 2015).

An interior designer is responsible for the planning, research, coordination and management of such projects. Just like all other applied disciplines, interior designers require formal education, professional experience and examination before becoming eligible as a professional interior designer (Gale, Duffey, Park-Gates & Peek, 2017). Project management is important in interior design particularly between the planning and implementation phases which are the finer points of the project and this process requires continuous communication as well as collaboration between various stakeholders that are responsible for the management of various different resources (Noorhani & Mustapha, 2021). With reference to the Architect's Act 1967 (Act 117) & Rules, the interior designer's responsibilities include coordination of consultant's work, inspection of works and estimates of cost and time amongst others which makes the interior designer's scope of work not just limited to designing. Štiklica (2020) states that in the interior design sector it is often perceived that design precedes project management but the author argues that project management is as important as design because when cost, time and quality is

not given enough attention then the design will be pointless due to factors that could have been controlled. Therefore, it is important for interior designers to obtain the necessary project management knowledge, skills and understanding to aid in the successful management of projects.

Haddad (2014) carried out a study on the on the necessity of research as an integral part of the interior design profession and in this study it was found that the interior design profession is not merely about knowledge but also about the capacity to manage that knowledge. Mustapha, Mohammad, Noorhani and Abidin (2013) on the other hand carried out a study on the establishment of the scope of work for interior designers which focused on exploring how importamt the scope of work is, in order to overcome the issues pertaining to the coordination of works. In their study, they found that most of the interior designers who were interviewed disclosed that they relied on their own experiences and common sense to manage interior projects which included establishing the scope of work.

Besides that, Hazim (2017) in his research entitled "Interior Design Management in Practice: A Theoretical Framework" focussed on revealing the characteristics and essence of interior design management as it is being practiced in two (2) countries namely, Malaysia and Australia. However, his study which was mainly focused on the practice, project and design process levels of interior design firms was only based on three different types of interior design firms located in two different cities in terms of culture which were Brisbane and Kuala Lumpur.

Meanwhile, Alawad and Baettaieb (2016) carried out a study to find out the nature and main characteristics of the interior designer's profile. In their study, the researchers identified project management skills as part of a classified set of capabilities required in

the practice of this profession. Dvir, Raz, and Shenhar (2003) in their research on the relationship between different aspects of project planning and the success of a project found that the preparation and proper planning of design had a strong positive effect on meeting project timeline, budget and objectives thus contributing to customer satisfaction. However, their research was mainly on project management and was not specific to interior design.

As described above, there have been numerous researches on design theories, interior design education, interior design profession characteristics as well as on project management in general but little has been found on project management in the interior design sector and its contribution to overall project success. Further exploration in the interior design sector has led to the discovery that there are numerous issues in the lifetime of an interior design project especially pertaining to interior scope of work and the management of the project. Therefore, the intention of this research is to focus on the challenges and issues in the management of interior design projects, the importance of project management processes and its impact on the successful completion of projects.

1.3 Problem Statement

Suresh and Sivakumar (2019) state that effective project management will aid in upholding and managing coordination works, planning the overall work process, completing tasks in a timely manner and in achieving the goals and objectives of the organization. According to Mustapha et al. (2013), the skills required in the practice of interior design has been talked about and analysed by researchers globally and the respective components have been delivered with reference to the requirements of the sector. Notwithstanding this, project management competency is still lacking and disregarded during the course of practice. Looking at the construction industry as a whole,

many persistent issues are directly or indirectly, related to unsatisfactory designs, design processes as well as how design management is practiced and these problems have contributed extensively to project time and cost overruns besides the more serious building and infrastructure failures (Pikas, Koskela, & Seppänen, 2020).

Ismail (2016) also states that problems such as project delay, cost overrun, low quality, and end-user dissatisfaction are common within construction projects which indirectly reduces the possibility to achieve project success. The author also found that buildability was an issue that stems from the conceptual design stage and these issues has not been addressed as much in existing literature. This goes on to prove that sound technical knowledge and experience, communication between various consultants and stakeholders as well as the availability of project management skills, knowledge and tools are required to improve the aforementioned situation.

Issues with relation to interior design projects include the management of projects, lack of efficiency and accuracy in progress monitoring (Roh, Aziz, & Peña-Mora, 2011), unrealisitic understanding of detailing works as well as complexities with relation to interior works (Ekanayake, Wong, Fard Fini, & Smith, 2021), deficiency of a standard indoor construction work system as well as low accuracy and efficiency in terms of quantitative measurements and calculations, material wastage and reduced environmental protection due to technical defects (Li & Liu, 2018), potential deviations from planned schedule or unexpected events which often times lead to unexpected financial disadvantages (Kropp, Koch, & König, 2018), the inability to determine the economic viability of projects with relation to project concept (Conconi & Pandolfi, 2018), overlapping scope of works with other consultants, mistakes in justification and scope of work that lacks clarity and detail (Mustapha, et al., 2013; Jasmani, 2016), difficulties of

communications and potentialities in the management of interior design projects (He, Wen, & Kim, 2019) and lastly, some organizations that are not updated with current technological needs due to financial constraints, a lack of knowledge as well as readiness and awareness level (Abd Hamid & Embi, 2020).

The issues mentioned above justify the need to conduct a study on the importance and use of project management by interior designers to increase project success since most of the issues stated are highly associated with management in one way or another. Existing literature shows insufficient documented knowledge and information with relation to the implementation of project management in interior design projects. The basic attention of available literature on this topic was mostly directed towards specific issues faced in the lifetime of interior design projects with studies on its possible solutions, but very little information has been found on the overall management of these projects to manage those issues. Therefore, this research focuses on studying the importance of project management processes in contributing to the quality of the end-product, satisfaction of stakeholders particularly clients and end-users as well as completion within time and cost hence, contributing to project success as a whole.

1.4 Research Aim and Objectives

The aim of this research is to study the implementation of project management processes in interior design projects and its relationship to project success. With relevance to that, the objectives of this study are detailed as follows:

i. To explore the challenges and issues in the management of interior design projects.

ii. To establish the measure of success in interior design projects.

iii. To examine the implementation of project management process framework for interior design projects in Malaysia.

iv. To determine the relationship between the implementation of the project management processes in interior design projects and project success.

1.5 Research Questions

With reference to the research objectives of this research as described above, below are the formulation of research questions that serves as a guidance to conduct this study:

i. What are the challenges and issues faced by interior designers in completing interior design projects?

ii. How is success measured in interior design projects?

iii. How is the project management process framework implemented in interior design projects in Malaysia?

iv. How does the implementation of the project management processes influence the success of interior design projects?

1.6 Research Methodology

The research approach that has been adopted in this study is the deductive approach whereby the theory has been established first through an extensive literature review. Then, empirical research and analysis was based on the data collected in order to answer the research questions developed based on the issues identified in the literature review. The research approach, research design and research techniques that have been applied in this study are summarized below based on the research onion and explained in a more detailed manner in Chapter 3:

i. Research Approach : Deductive
ii. Research Strategy : Survey
iii. Choice of Data Collection : Quantitative
iv. Technique : Questionnaire

The study began with an in-depth literature review on the topics related to this study which includes:

(1) Challenges and issues faced by interior designers in successfully completing interior design projects.
(2) The definition of a project management process framework for interior design projects.
(3) The determinants of project success.

The information obtained from the literature review on project management in the interior design sector, its impact on and contribution to project success as well as the project management process framework implemented in interior design projects has been

gathered to develop the theoretical framework and also for setting the aim and objectives for this study besides being used to design the survey questionnaire. At this point RO 1 and RO 2 were to be achieved.

Next, for the part of data collection to identify how the project management process framework is implemented in interior design projects in Malaysia, Quantitative Methods for data collection has been applied through a Questionnaire Survey that was designed based on the framework of project management in interior design projects. The project management process framework was determined based on the data gathered from the extensive literature review. A closed format questionnaire was used in order to ensure a more systematic analysis of the data collected. The questionnaires were distributed online using a Google link that was distributed to the selected respondents via email and professional and social networking platforms such as LinkedIn and Instagram. The results and findings were analysed using SPSS and presented in order to achieve RO 2 and RO 4.

1.7 Scope of Research

This study covers topics on project management processes in interior design projects and its relationship with project success. The utilization of project management processes is based from comparisons of processes utilized during the lifetime of interior design projects that is available in existing literature. The pre-determined project management framework (RIBA Plan of Work) is then tested on its relationship with project success. The scope of study is limited within the context of interior design firms in Malaysia.

1.8 Significance of Study

The interior designer is responsible for the design of an ideal space whereas the architect addresses the overall theme of a building which also encompasses its general spatial layout (Mustapha, 2019). There have been numerous studies that have been carried out on design theories, education and profession but little has been found on interior design management (Mustapha et al., 2013). Besides that, Hazim (2017) states that interior design as a spatial discipline unlike architecture, is still evolving and growing and in this regard, is still struggling in the development and establishment of its identity. The author also adds that there is not much empirical research with relation to the practice of interior design and its management in a different range of settings. The review of literature exposed a lack of information and research with relation to the management processes of interior design projects and its relationship with project success pointing to the need for a study such as this. Such knowledge is imperative in order to clearly understand the existing situation and to emphasize the importance and contribution of the relevant project management processes in influencing interior design project success, and later, identifying potential opportunities of interior design management.

1.9 Structure of thesis

This research is structured into six (6) Chapters. The overview of the chapters following Chapter 1 is presented as follows:

Chapter 2: Literature Review

Chapter 2 describes all the relevant information obtained from literature review that relates to this study. It begins with presenting information on the challenges and issues faced by interior designers during the design stages of interior design projects and its effect on project success. This chapter then further explains the available project

management frameworks for interior design projects. Literature review on project management influence on the success of interior design projects will follow next and this will include project success definition, criteria, factors and measures.

Chapter 3: Research Methodology

Chapter 3 describes the processes involved to conduct this study. It begins with the research design which discusses the outline of the research design and its suitability to adapt an Explanatory type of research. Then it follows with presenting the research methodology and justification of choosing to utilise the quantitative method for this study. Subsequently, research technique is discussed by describing the chosen type of data collection and the justification for choosing survey questionnaire.

Chapter 4: Data Analysis and Findings

Chapter 4 describes the analysis and findings of the data collected from the questionnaire. The findings and analysis of data is documented with reference to the questionnaire structure. Finally, analysis on the relationship between project management in interior design projects and project success is conducted. As such this chapter is meant to analyse data in response to the research aim and specifically Research Objective (3) and (4). This chapter also summarizes the research findings with detailed discussions in order to fulfil the research objectives as stated above.

Chapter 5: Conclusion

Chapter 5 concludes the entire study by presenting the significant findings and reflecting on the fulfilment of research objectives and research questions. Additionally, this chapter provides recommendations for future research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This section reviews existing literature that is related to this study which consists of information regarding the interior design sector in Malaysia, interior design management and project success. This section serves as a guideline in establishing the research objectives and questions of this study. It is also used to identify the framework of project management processes that can be used in interior design projects. This is then used to explain the relationship between project management and project success. The literature review aims to:

a) Gain an in-depth understanding of the topic chosen above in order to derive the research objectives and research questions.
b) Make a comparison between the findings of this study against the findings of this literature review.

With reference to the research methodology of this study, the literature review will be used deductively as a framework for the research objectives and questions as described in Chapter 1.

2.2 Key Definitions

The section describes the key definitions within the context of this study which encompasses interior design management, design process/stages, project management framework and project success. All these definitions from various sources serve as a guideline in terms of the study area when searching for suitable sources of references for this study.

2.2.1 Definition of Interior Design Management

Štiklica (2020) states that project management is as crucial as design processes and therefore, it is pertinent for designers to understand the importance of project management in the interior design sector as well as to be knowledgeable of all the project management elements in order to manage interior design projects effectively. Additionally, with reference to the study conducted by Hazim (2017), the nature of interior design management can be characterized into six (6) domains namely, "expression of interest, workplace milieu, competency, variable factors, output and quality, and polemics". He further adds that interior design management is considered as a crucial part in the practice of interior design and the delivery of its services thereof as part of the built environment industry. This includes practice management, project management and design process management. Mustapha et al., (2013) on the other hand state that project management for interior projects (interior design management) demands a high level of commitment, knowledge and skilful understanding of the entire process in order to achieve the objectives of the project through the processes of planning, executing, monitoring and controlling the project till its completion. The National Council for Interior Design Qualification (CIDQ) states that "Interior design is a distinct profession with specialized knowledge applied to the planning and design of interior environments that promote health, safety, and welfare while supporting and enhancing the human experience". An

interior design project also involves project management which encompasses the management of a project's budget, contracts, schedule, consultants, staffing, resources, as well as general business practices (Council for Interior Design Qualification).

2.2.2 Definition of Design Process/Stages

Ismail (2016) states that the design process is considered as an identity process for the company, their customers and their investors. The author further adds that that activity of designing normally consists of obtaining the client's brief, understanding project requirements and proposing a design scheme. Clevenger and Haymaker (2011) define the design process as "implementation of a strategy to a challenge resulting in an exploration" which is ideally made of three (3) elements namely, challenge, strategy and exploration. The design process is seen as a collaborative activity that brings together various expert groups (stakeholders) with different knowledge domains that enables the exchange of knowledge (Fischer, Östlund & Peine, 2021). The Design Institute of Australia in its interior design services guideline, lists the tasks of brief formulation and site survey, preliminary sketch drawing, cost plan and written report as part of the design stage. Meanwhile, Hazim (2017) describes the design project as a complex project that evolves continuously in complexity and this is relative to the level and type of management to be utilised. As an example, a simple project that is expected to be completed in a week varies significantly in terms of managerial requirements when compared to a multi-site, high budget project. The stages in a construction project whether in relation to architecture or interior design involves the processes of briefing, designing, constructing, and operating and these processes are organised into eight (8) stages in the RIBA Work Plan (RIBA, 2020) which will be elaborated in the sections that follow. In summary, the stages in the work plan provide an overview of a project from the beginning to completion along with the workflow of the architect / interior designer.

2.2.3 Definition of Project Management (PM) Framework

The Cambridge English Dictionary defines 'framework' as "a system of rules, ideas, or beliefs that is used to plan or decide something". In the context of a project management framework, Mohindra and Srivastava (2019) state that some of the present developments on project management frameworks include Project Management Body of Knowledge (PMBOK), PRojects IN Controlled Environments (PRINCE2), APM Body of Knowledge (APMBoK) and ISO 21500:2012 Guidance on Project Management amongst others while Hübner, Volk and Schultmann (2018) suggest that there are various project management standards that can be used to support project management in achieving project objectives. On the other hand, Damasiotis and Fitsilis (2019) states that many project management frameworks have been introduced over the past few years to assist project managers and project stakeholders to better understand their respective roles in a certain project, to allow them to be more mindful of their expected operations, and to guide their actions systematically throughout the execution of the project. With relevance to this, Suresh and Sivakumar (2019) states that effective project management will aid in upholding and managing coordination works, planning the overall work process, completion of tasks in a timely manner and in achieving the goals and objectives of the organization.

In defining project and project management, PMI (2017) stated that:

> "*Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management is achieved through the appropriate application and integration of the project management processes identified for the project."* (p. 542)

In summary, the project management framework groups project management processes into the five (5) Project Management Process Groups of initiating, planning, executing,

monitoring and controlling, as well as closing which is based on the 10 Knowledge Areas as described in PMBOK that are usually employed in the management of projects.

2.2.4 Definition of Project Success

According to PMI (2017, p.547), the success of a project is measured in relation to the project objectives and pre-determined success criteria whereby a business case outlining elements like project objectives, the investment required for the project, the financial and qualitative criteria that defines project success is often developed before a project is initiated. Radujković and Sjekavica (2017) define projects success by differentiating it from project management success whereby they state that project success is linked with the outcome when the overall project goals achievement is evaluated, whereas project management success is measured against the traditional measurements of time, cost and quality performance while Al-Hajj and Zraunig (2018) state that project success is influenced by various factors that are out of the control of project management therefore, defining project success as dependent on project management success and the success of the end-product. On the other hand, Badewi (2016) states that in the short term, the efficiency of the project is used to measure project success while in the medium and long term, the project's effectiveness in achieving the expected result is used in measuring project success.

Meanwhile, Davis (2017) in conducting a study to address the gap to compare the differing views of project success of multiple stakeholder groups, found that all stakeholders do not value all project success dimensions in order to achieve project success. This implies that different stakeholders perceived project success differently. Additionally, Gomes and Romão (2016) suggests that all the stakeholders involved in a project tend to perceive success in different ways, however, while there may be various

perceptions in the definition of project success, numerous authors agree on using the triple constraint of cost, time and quality in determining and defining the achievement of a project's objectives. Similarly, Albert, Balve and Spang (2017) stated that one of the earliest attempts in evaluating project success called Barnes' Iron Triangle was based on time, cost and performance. However, the authors further add that these criteria have expanded over time and specifically criteria that focus on stakeholder satisfaction have gained prominence in recent times hence concluding that there is no common definition for the term project success.

2.3 Interior design as a practice and field of study

Interior designers are responsible for the aesthetics of an interior space and to ensure its functionality through the coordination of proper systems and processes based on the owner's or user's requirements (Abd Hamid & Embi, 2020). Turner (2021) defines interior design as a discipline that is characteristically related to and relies on the elements of interpersonal relationships, collaboration, communication as well as empathy. Additionally, interior design is defined by The Council for Interior Design Qualification (CIDQ) as follows:

> "*Interior design encompasses the analysis, planning, design, documentation, and management of interior non-structural/non-seismic construction and alteration projects in compliance with applicable building design and construction, fire, life-safety, and energy codes, standards, regulations, and guidelines for the purpose of obtaining a building permit, as allowed by law. Qualified by means of education, experience, and examination, interior designers have a moral and ethical responsibility to protect consumers and occupants through the design of code-*

compliant, accessible, and inclusive interior environments that address well-being, while considering the complex physical, mental, and emotional needs of people."

Havenhand (2019) highlights that interior designers place emphasis on how users use an interior space in terms of movements, needs, as well as emotional concerns, both individually and in connection with others. The author further adds that good interior design does not only the fulfil the functional needs of its users but also their emotional, personal, and spiritual needs too. Similarly, McLane and Pable (2020) state that the built environments plays a role in improving the well-being of its users by encouraging interpersonal interaction and socialization. On the other hand, Samah, Ibrahim and Abd Wahab (2018) highlight that interior elements incorporate the elements of materials, technology and construction to make spaces habitable, functional, aesthetically pleasing and psychologically satisfying for human activities to be carried out. Additionally, Alawad and Baettaieb (2016) highlighted six key points that define the main characteristics of an interior designer's profile which are the practical side, scientific research, analytical and problem-solving features, service requirements, administrative abilities, impressionist skills and technical capabilities. Ekanayake, Wong, Fard Fini and Smith (2021) in comparing exterior and interior construction environments, state that there are substantial physical and contextual variances between the two whereby the exterior construction environment primarily revolves around the construction of outer columns, beams and walls, whereas interior construction encompasses systems such as electrical works, plumbing and sanitary works, fire fighting systems, framing and drywalls.

Klingenberg (2008) concluded that this clear and definite idea of interspace paves a way to differentiate between interior architecture as a field of study versus interior architecture

as a profession, and that there is a need for a specific theory with relevance to this field of study to be developed. Similarly, Cys (2009) states that the theory of the interior design discipline is wide not just due to the nature of it as a discipline and a practice that requires and benefits through its association with many other disciplines, but also because a significant group of potential contributors to interior design theory such as interior design academics have an allegiance intellectually and professionally to other fields. Furthermore, Hazim (2017) highlights that unlike architecture, interior design is also a spatial discipline that is still emerging while struggling to develop and establish its identity. At the same time, Havenhand (2019) states that in the last 30 years, despite many reassessments by professionals in the design field, architecture is still placed as the dominant term while interior design remained as not deconstructed.

2.4 Overview of the Interior Design Sector in Malaysia

The interior design sector in Malaysia is represented by the national institute of the Malaysian Institute of Interior Designers (MIID) also known as Pertubuhan Perekabentuk Dalaman Malaysia (PPDM). This institute is the consolidation of the two previous bodies which are Interior Designers Institute of Malaysia (Institut Perekabentuk Dalaman Malaysia or IPDM) and the Malaysian Society of Interior Designers (MSID) (Malaysian Institute of Interior Designers (MIID), 2020). The interior design practice is also governed by the Board of Architects Malaysia to ensure that the practice abides by ethical and fair industry best practices. Professional interior design services are delivered by registered interior design professionals who have obtained the required knowledge, skills and certifications to see projects from the beginning stages of visualisation and conceptualisation as well as on-site implementation right up to completion in a manner that complies with the parameters as stipulated by the legislative provisions of interior design in Malaysia (Ghazali, 2020).

2.5 Challenges and issues in the management of interior design projects

This sub-chapter reviews the literature with relevance to the issues that are faced from the beginning to the completion of interior design projects. The information gathered contributes to the development of the problem statement for this study besides guiding the development of this study.

2.5.1 Management of interior design projects

It was found that issues and challenges especially in the management of interior projects keeps appearing and even so, project management competency is still neglected and ignored during practice (Mustapha et al., 2013). Design and management are two activities required to work together at certain phases and during certain processes in a project (Štiklica, 2020). Therefore, this requires interior designers to be equipped with the appropriate project management knowledge, skills and understanding in order to manage the process and ultimately the project successfully. The authors further add that when the interior design sector was explored, it was found that there are many issues that come up in the lifetime of an interior design project especially with regards to interior scope of work and the management of the project which may be caused by other consultants' faults, disruptive workflow, client's demands or the designers itself.

Besides that, the complexity and minute details of interior construction works makes the detailed progress monitoring challenging (Roh, Aziz, & Peña-Mora, 2011). The authors identified schedule, cost overruns and progress monitoring as issues that are faced in managing interior design projects. In construction projects, the lack of efficiency and accuracy in progress monitoring are considered as two main factors that contribute to schedule and cost overruns (Ekanayake, Wong, Fard Fini, & Smith, 2021). Li and Liu (2018) on the other hand highlighted a deficiency of a standard indoor construction work

system which hampers the progress of construction and quality assurance besides causing an increase in cost. Considering the Malaysian construction industry in general, Ismail (2016) found that problems such as project delay, cost overrun, low quality, and end-user dissatisfaction are common within construction projects and this indirectly reduces the possibility to achieve project success. Similarly, Kropp, Koch, and König (2018) found that even though significant effort is put into the planning and control of potential deviations or unexpected events, various types of deviations tend to occur in projects and thus lead to cost overruns for the organizations involved, due to the manually performed monitoring progress that requires many human resources.

With relation to the literature reviewed above, it can be concluded that most of the issues faced in the management of interior design projects affects the schedule, cost and quality of the projects. While the issues may be of various sorts, the possible solution mainly points back to systematic planning, coordination and monitoring of work besides the management of change.

2.5.2 Determination of the project's economic viability

Lee (2014) states that the inability to determine the economic viability of projects with relation to project concept is an issue whereby there was a lack of connectivity between the concept of the project and determining its economic and financial sustainability. Ideally, the process should function based on a feedback scheme, whereby once the concept is determined, it should be analysed against legal requirements, technical requirements, and economic feasibility to identify and fix any possible setback (Conconi & Pandolfi, 2018). The authors further add that starting the project from a wider set of project factors can ultimately decrease the repetitive need for changes and modifications in the later stages of the project.

2.5.3 Unclear scope of work

Mustapha et al. (2013) emphasizes how imperative a precise scope of work is in the management of interior projects is in order to combat the issues with regards to work coordination. Additionally, the authors identified some issues in interior design projects in their study as listed below:

- Overlapping scope of works with other consultants such as architects
- Mistakes in justification and scope of work that lacks clarity and detail which in return might affect the cost and schedule of the project
- Issues of scattered items due to an unclear scope of work
- Background and proficiency of the interior project coordinator can also be an influencing factor that contributes to the performance of project delivery

They further state that the framework of the work development process for the professional interior designer shows that in order to be a professional interior designer, one must obtain the knowledge and skills with regards to business management and the organization of people. According to Noorhani, Mustapha and Abidin (2014), this proves the association of the interior design project manager to the production and the execution of the interior works that includes the aspects of:

- Project which includes project planning, problem solving and management of time
- Client management which includes consulting and negotiating
- Project implementation which includes coordinating, integrating, managing and communication
- Contract and legal knowledge

- Technical knowledge
- Administration and business skills

Similarly, Jasmani (2016) highlighted the lack of coordination between a multidisciplinary scope of work within project construction management in interior, architecture, and other related fields causes an increase in time and cost of the interior design construction projects.

2.5.4 Accuracy in detailing

According to Roh et al. (2011), in comparison to external construction, the construction of interior spaces consists of a varied amount of construction elements such as electrical, heating, ventilation, and air conditioning (HVAC), plumbing and sanitary works, fire protection systems, and security systems behind walls or above ceilings besides numerous schedules that are associated with the performance of each subcontractor. Other issues are schedule delays and cost overruns caused by the intensive and tedious process of manual interior construction progress reporting.

Like the findings of Roh et al. (2011), Li and Liu (2018) identified the main challenges in the construction and management of interior design projects to be, low accuracy and efficiency in terms of quantitative measurements and calculations, material wastage and reduced environmental protection due to technical defects. It was also found that buildability is an issue that was found to stem from the conceptual design stage and this issue had not been addressed as much in existing sources of literature (Ismail, 2016). Similarly, Ekanayake et al, (2021) found that in the interior construction environment, unrealisitic understanding of detailing works as well as complexities with relation to interior works contribute majorly to schedule delays and cost overruns. In considering the

construction industry as a whole, Yap, Lim, Skitmore and Gray (2021) identified inaccurate estimates of resources which includes material quantity, equipment production rate, labour production rate, inaccurate bills of quantities and low bids to be one of the biggest contributors to schedule delay.

2.5.5 Communication issues

He, Wen, & Kim, (2019) identified difficulties of communications and potentialities in the management of interior design projects while further elaborating that in the existing practice of design process, there appears to be communication gaps not only between desginers and clients but also internally, between the designer and the design project manager. Besides that the authors also state that, designers have a lack of knowledge pertaining to the concepts of management and they face a difficulty in implementing a valuable model with relevance to their everyday practices. Similarly, Mustapha et al. (2013) also states that miscommunication is one of the issues faced in interior design projects. Zuo, Zhao, Nguyen, Ma and Gao (2018) highlight that as huge amounts of information are generated during the course of a typical construction project, effective and efficient communication is pertinent in the management of the project so as to ensure that information is dissipated in a timely and accurate manner amongst the various project stakeholders. On the importance of communication, Self (2019) states that clear and universally understood means of communication should be established during the conceptual development to ensure effective collaboration between stakeholders.

2.5.6 Other issues

Another issue is that some organisations are still using old versions of software and equipment besides not being updated with the current technological needs (Abd Hamid & Embi, 2020). In relation to that, Valtiner and Reidl (2021) suggest that with the

emerging digital transformation that brings along economical and societal challenges, opportunities and changes, it is imperative for organizations to respond to the said challenges in an adaptive and flexible manner in order to gain benefit from these developments. Besides that, Li and Liu (2018) pointed out the lack of safety awareness in the interior design construction drawings whereby safety considerations for the construction aspect is rarely taken into account.

2.5.7 Summary of challenges and issues in the management of interior design projects

Huber (2021) highlights that as recognition on the influence of design on performative outcomes grow, designers are responsible to provide informed-design services by first defining problems clearly. With reference to the literature reviewed above, the key issues in the management of interior design projects are summarised with reference to the 10 PMBOK knowledge areas of as follows:

Table 2. 1: Summary of Challenges and Issues

Knowledge area	Issue	Source
Project Scope Management	Overlapping scope of work	(Mustapha, Mohammad, Ahmad Noorhani, & Zainal Abidin, 2013)
	Failure to fully understand client requirements	(Ismail, 2016)
Project Schedule Management	Lack of standard indoor construction work system	(Li & Liu, 2018)
	Progress monitoring issues	(Roh, Aziz, & Peña-Mora, 2011), (Kropp, Koch, & König, 2018)
	Schedule overrun	(Ismail, 2016), (Roh, Aziz, & Peña-Mora, 2011), (Kropp, Koch, & König, 2018)
Project Cost Management	Inability to determine the economic viability of projects	(Conconi & Pandolfi, 2018)

	Cost overrun	(Ismail, 2016), (Roh, Aziz, & Peña-Mora, 2011)
Project Quality Management	End-user dissatisfaction	(Ismail, 2016)
	Quality Control (work defects, quality of furniture, fitting and equipment, quality of workmanship)	(Li & Liu, 2018)
Project Risk Management	Low accuracy and efficiency in terms of quantitative measurements and calculations	(Li & Liu, 2018)
	Technical defects	(Li & Liu, 2018)
	Buildability issues	(Ismail, 2016)
	Lack of safety awareness	(Li & Liu, 2018), (Ismail, 2016)
Project Stakeholder Management	Design issues caused by other consultants' faults, disruptive workflow, client's demands or the designers itself	(Mustapha, Mohammad, Ahmad Noorhani, & Zainal Abidin, 2013)
	Lack of coordination between multidisciplinary consultants/ contractors	(Jasmani, 2016)
Project Communications Management	Difficulties of communications	(He, Wen, & Kim, 2019), (Mustapha, Mohammad, Ahmad Noorhani, & Zainal Abidin, 2013)
Project Resource Management	Organization / team members not being up to date with current technological software / technical knowledge	(Abd Hamid & Embi, 2020)
	Designers have a lack of knowledge pertaining to the concepts of management	(He, Wen, & Kim, 2019), (Noorhani & Mustapha, 2021)

Source: Various authors

With reference to PMI (2017, p. 10), most of the issues as mentioned above are a result of projects that are managed poorly or an absence of project management. In contrast, effective project management should enable the project team to "meet business objectives, satisfy stakeholder expectations, be more predictable, increase chances of success, deliver

the right products at the right time, resolve problems and issues, respond to risks in a timely manner, optimize the use of organizational resources, manage constraints, balance the influence of constraints on the project and manage change in a better manner" (Project Management Institute, 2017).

2.6 Project Management (PM) process framework in interior design projects

As the interior designer's core business encompasses the design, construction as well as the management of the project, it is imperative for them to obtain the knowledge and have the understanding of project management processes, technical knowledge and systems of work to deliver and complete projects successfully (Mustapha et al, 2013). This sub-chapter reviews literature with relevance to the phases and processes involved in the successful completion of an interior design project. The information gathered will be used as a theoretical framework to establish the Project Management (PM) process framework for interior design projects in Malaysia.

2.6.1 NCIDQ phases of the interior design process

The National Council for Interior Design Qualification, NCIDQ (2003) defined the widely accepted phases of the interior design process as Programming, Schematic Design, Design development, Contract Documentation and Contract Administration. The council further lists the tasks that the practice and management of an interior design project may involve. These include:

- Project management
- Project goals which involves the understanding and documentation of the client's and stakeholders' goals and objectives with reference to the project (project scope management)

- Data collection in order to maximize design outcomes and stakeholder satisfaction, evaluation and assessment of existing site conditions
- Design conceptualization
- Selection of materials, furniture, fitting and equipment (FF&E)
- Documentation that involves contracts and permits as well as documentation of design by phases of schematic, design development besides construction drawings and specifications.
- Coordination of other consultants such architects, engineers and other specialty consultants
- Contract administration that involves the tasks of distribution and bid analysis, the administration of construction, review and pay-outs of contractors, assessment of shop drawings and other relevant documents and drawings, site visits and work progress reports and lastly, project close-out
- Pre-Design and Post-Design Services which are used to measure the success of the project with reference to the client or stakeholder's expectations and goals

With reference to the above, it is obvious that project management knowledge is crucial for interior designers to successfully complete a project as most of the stages and processes involved in a typical interior design project involves management skills besides the creative expertise. While the overall design outcome may be the priority on the stakeholders' goals and objectives, aspects such as budget, schedule, quality and resource management amongst others play an imperative part in the determination of the success of a project. However, while NCIDQ (2003) broadly described the phases involved in an in a typical interior design project, there was no elaboration on the processes involved in each relevant phase.

2.6.2 RIBA Plan of Work

On the other hand, the British Institute of Interior Design (BIID) suggests the RIBA Plan of Work to be an excellent resource for interior designers as it provides valuable insight on a project's workflow right from the beginning to the end of the project (British Institute of Interior Design, 2021). Hughes (2003) states that the RIBA Plan of Work originated beginning with numerous authors attempting to map out the processes inherent in design during early researches about design methods. Finally, it was introduced in 1963 as a framework for architects to implement on projects along with their clients. This in return brought greater clarity to the different stages of a project. The RIBA Plan of Work consists of eight stages of which its culmination acts to notify the brief, design, construction, handover and use of a building (RIBA, 2020). The eight stages as documented in the RIBA Plan of Work along with its respective milestones are summarised in the Table 2.2 below. This is then followed by Table 2.3 that details the processes involved in each stage of the project.

Table 2. 2: Summary of RIBA Plan of Work (Source: RIBA, 2020)

Stage	**Milestone**
0: Strategic Definition	Confirmation of client requirements.
1: Preparation and Briefing	Client approves project brief and confirmation of buildability on site.
2: Concept Design	Architectural concept with reference to project brief is approved by client.
3: Spatial Coordination	Spatial coordination of architectural and engineering information to be completed.
4: Technical Design	Completion of all required design information in order to proceed with the manufacturing and construction of the project.

5: Manufacturing and Construction	Completion of manufacturing, construction and commissioning. No more design work at this stage except for response to site queries.
6: Handover	Handover as well as initiation of aftercare completed and building contract concluded.
7: Use	Project is used, operated and maintained efficiently. This stage lasts for the lifetime of the completed project.

Table 2. 3: Project Management Processes by Stages (Source: RIBA, 2020)

Stage	Process
Strategic Definition	Preparation of client requirements
	Development of business case for feasible options including review of project risks and project budgets
	Confirmation of option that best delivers client requirements
	Review of feedback from previous projects
	Site appraisal
Preparation and Briefing	Preparation of project brief including project outcomes and sustainability outcomes, quality aspirations and spatial requirements
	Feasibility studies
	Confirmation on project budget
	Sourcing of site information including site surveys
	Preparation of project program
	Preparation of project execution plan
	Preparation of responsibility matrix
Concept Design	Preparation of design concept incorporating relevant requirements in alignment to cost plan, project strategies and outline specification
	Agreement on potential changes in project brief
	Design reviews with client and project stakeholders

	Preparation of design program
Spatial Coordination	Undertake design studies, engineering analysis (if any) and cost exercises to test design concept
	Completion of spatially coordinated design aligned to updated cost plan, project strategies and outline specification
	Initiation of change control procedures
	Review of design against building regulations or any other authority requirements
Technical Design	Development of technical design and drawings
	Preparation and coordination with design team on Building Systems Information
	Preparation and integration of specialist/ subcontractor Building Systems Information as part of final specification
	Preparation of construction program
Manufacturing and Construction	Finalisation of site logistics
	Manufacturing of building systems and commencement of construction
	Monitoring progress against construction program
	Inspection of construction quality
	Resolve site queries as required
	Undertake commissioning of project
	Preparation of defects list
	Preparation of building / operational manual (including health and safety file and fire safety information)
Handover	Hand over building in line with Plan for Use Strategy
	Review of project performance
	Seasonal commissioning as required
	Rectification of defects
Use	Appointment of facilities management and asset management teams, and strategic advisers as needed

	Implementation of facilities management and asset management
	Post occupancy evaluation of building performance in use
	Verification of project outcomes
	Update of building manual (including as-built drawings)

2.6.3 Interior design work development process

Similarly, according to Noorhani, Mustapha and Abidin (2014), interior design projects are like any project in the construction industry whereby the scope of the interior designer is as shown in Figure 2.1 and a detailed interior design work development process is shown in Figure 2.2. The findings of Ahmad Noorhani et al. (2014) was found to be comparable to the RIBA Plan of Work whereby a typical interior design project is broken down into various stages, with a range of processes that are required to be carried out under each stage.

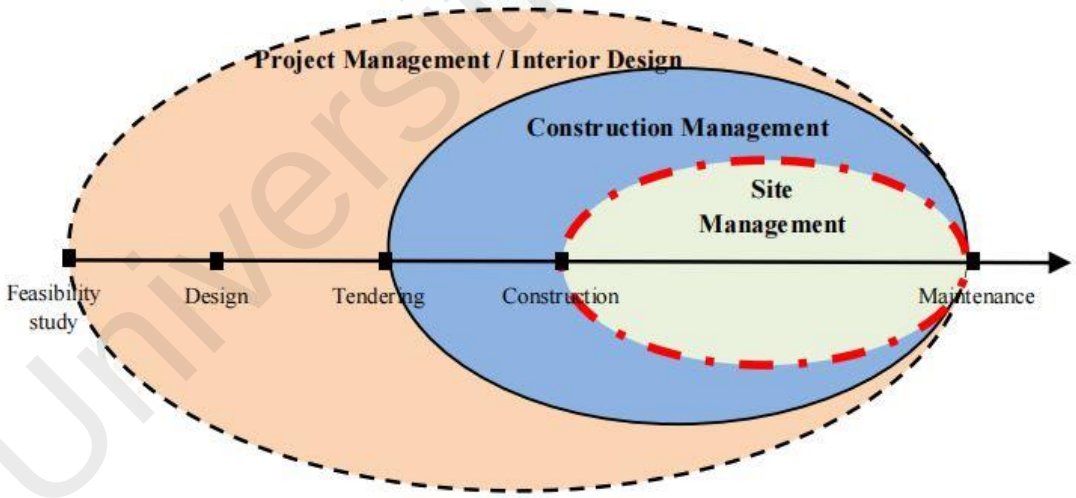


Figure 2. 1: Scope of Interior Design in Construction Industry
Source: (Noorhani, Mustapha, & Zainal Abidin, 2014)

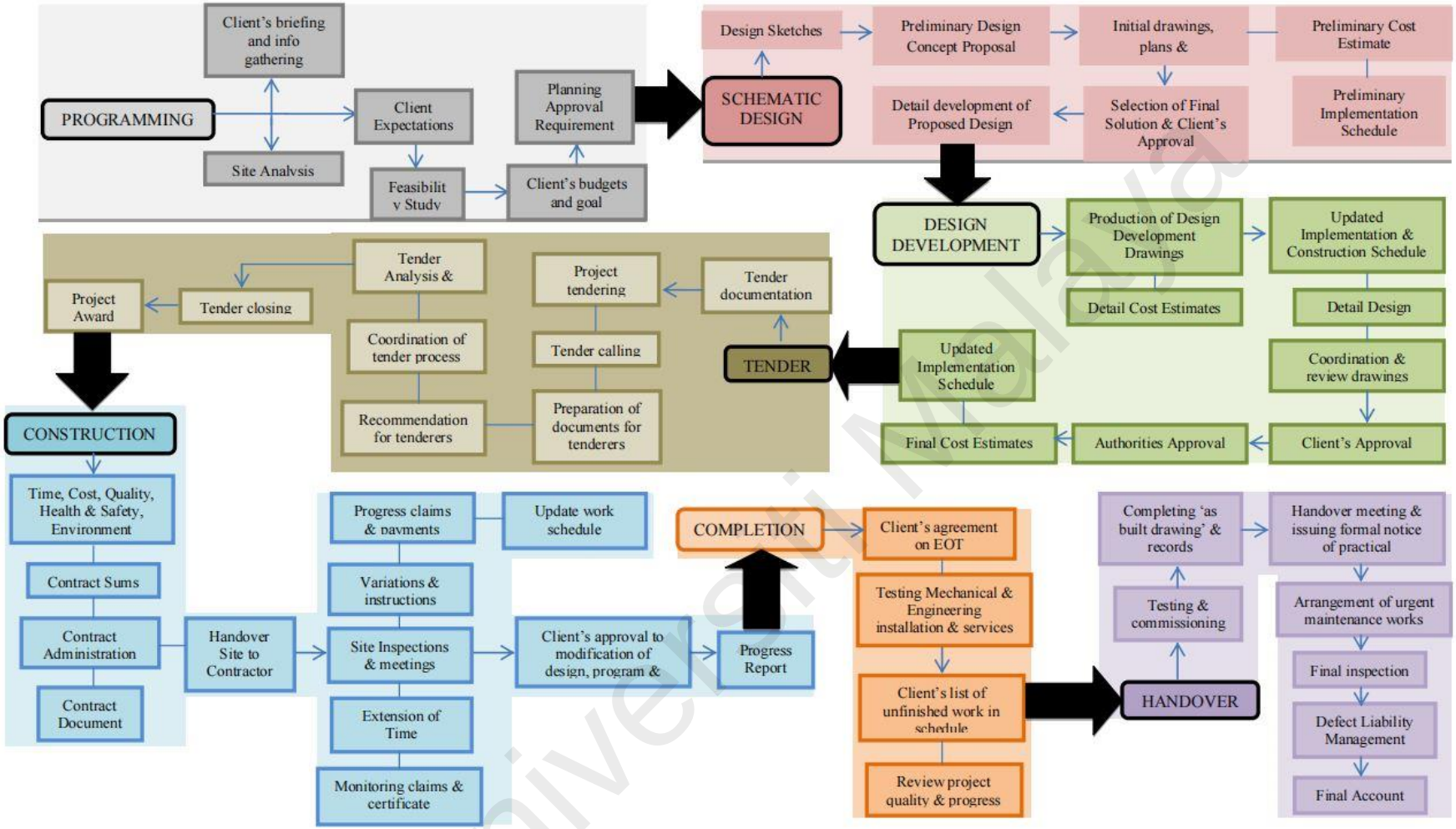


Figure 2. 2: Interior Design Work Development Process

Source: (Noorhani, Mustapha, & Zainal Abidin, 2014)

Lastly, according to the Architect's Act 1967 (Act 117) & Rules, the interior designer's responsibilities include coordination of consultant's work, inspection of works and estimates of cost and time amongst others which makes the interior designer's job scope not just limited to designing. However, the guide only described the responsibilities of the interior designer but there was no elaboration on the processes involved in each phase of a project.

2.6.4 Summary of Project Management (PM) process framework

In summary, the stages or phases of a project as described by The National Council for Interior Design Qualification, NCIDQ (2003), the RIBA Plan of Work, Noorhani et al. (2014) as well as the Architect's Act 1967 (Act 117) & Rules were found to be comparable although some terms used in labelling each stage were distinct. While all sources described the stages of a project, the RIBA Plan of Work clearly set out the tasks to be undertaken by the design team at each project stage (Sinclair, 2019). Besides that, the milestones to be achieved at the end of each phase was also clearly spelt out. Therefore, the RIBA Plan of Work is used as the theoretical framework to study the implementation of project management processes in interior design projects in Malaysia.

2.7 Project success

The main determination of the implementation of project management practices is to achieve consistent project success (Al-Hajj & Zraunig, 2018). According to Castro, Bahli, Farias Filho and Barcaui (2019), project success is no longer just measured based on the triple constraints of time, cost and quality but rather has become a method to evaluate the benefits of a project to organizations as well as stakeholders. The subject of project success has been continually studied upon by scholars and professionals with the aim of refining and aligning the subject with the practical needs of organizations. Project success

has been defined in the previous section 2.2 Key Definitions. The following sub-sections reviews the literature on various other factors related to project success.

2.7.1 Project success measurement

With reference to PMI (2017, p. 34) pertaining to project success measures, the success of a project should be measured based on the achievement of project objectives as the stakeholders of a project may have different perspectives on what is considered as a successfully completed project and which of those factors are considered as the most crucial. Dvir et al. (2003) in their research on the relationship between project planning and project success state that success is typically associated with achieving the project's budget and schedule as well as achieving an acceptable performance level. The authors further state that the success measurement of a project may also vary depending on subjective, individual judgment and in their study, they perceive success through the satisfaction of the main stakeholders involved in the project which includes:

- the end-user benefits (success from the end-user's point of view)
- the project manager (meeting planning goals)
- the contracting office (success at contractor level which includes two other criteria of commercial success of the project and the potential for future revenues).

Similarly, Castro et al. (2019) conducted a dense literature review to study the various perspectives on the topic of project success hence, arriving at a conclusion that there was an overlap of success dimensions even when the project contexts were different. The author concluded that project efficiency, benefits for the organization and for stakeholders, business success, and end-user's satisfaction were the widely accepted dimensions. Radujković and Sjekavica (2017) on the other hand, emphasizes on differentiating project

success from project management success. The main difference concerns linking project success with the outcome from the assessment of overall accomplishment of project goals, while project management success relates to the traditional method of using time, cost and quality performance as a basis to measure success. With reference to that, a project can be considered a success despite being unsuccessful in terms of project management because it has achieved better and long-term goals. Similarly, Al-Hajj and Zraunig (2018) state that project success is influenced by various factors that are out of the control of project management therefore, defining project success as dependent on project management success and the success of the end-product.

Furthermore, Suresh and Sivakumar (2019) suggest that project management effectiveness measures the extent to which the project goals and objectives have been accomplished. They also add that a project is considered effective when the full satisfaction of the users is achieved by meeting all the objectives of the project and all designated interests of the project such as sponsors and initiators who accept the results of the project and hence close the project officially. In their study, Suresh and Sivakumar (2019) identified five (5) factors that affect project management effectiveness which include; (1) the life cycle of the project, (2) clear definition of roles and responsibilities, (3) management of time, (4) economic factors and (5) risk.

Additionally, Sanjuan and Froese (2013) as well as Joslin and Müller, (2016) state that a project is considered successful when stakeholders' requirements and expectations are met and this is usually when a project is completed within schedule or on time, within budget and within the planned scope and quality. In their study, they identified a range of critical success factors (CSF) which inlcude, "project mission, support from senior management, clear and realistic objectives, strong and detailed plan that is kept up to date,

good communication and feedback, user/client involvement, client acceptance, skilled, suitably qualified and sufficient staff team, effective change management, competent project manager, strong business case or sound basis for project, sufficient and well allocated resources, characteristics of the project team leader, proven or familiar technology, realistic schedule, risk addressed/assessed/managed, project sponsor/champion, effective monitoring and control, adequate budget, organisational adaptation/culture/structure, good performance by suppliers/contractors/consultants, planned closed down/review/acceptance of possible failure, training provision, political stability, correct choice/past experience of PM methodology/tools, environmental influences, past experience/learning from, project size/level of complexity/number of people involved/duration, and different viewpoints" (Sanjuan & Froese, 2013).

Lastly, Demirkesen and Ozorhon (2017) in studying the impact of integration management on the performace of construction project management highlighted that time, cost, quality, safety and client satisfaction are the elements that form the dimensions of project management performance. Their research measured project management performance using indicators of whether the projects surveyed were completed within schedule, within budget, achieved the required quality, achieved the required safety and if it satisfied the client's requirement. Similarly, Wu, Liu, Zhao and Zuo (2017) highlighted that project success comprises of hard indicators such as quality, cost, schedule, safety, as well as soft indicators such as project stakeholders' satisfaction, efficiency and effectiveness of project management.

Based on the literature reviewed above, it can be concluded that traditionally the success of a project is measured based on the iron triangle of cost, time and quality. If these three (3) factors are met, it is adequate to say that the project is a success. However, as pointed

out by numerous other authors, overall project success is a much wider concept as compared to the traditional 'iron triangle' of project efficiency. The definition of project success has become broader with the inclusion of additional dimensions of the project such as "client satisfaction, realization of customer objectives, end-users satisfaction, and the satisfaction of other groups of stakeholders" (Gomes & Romão, 2016). Therefore, as stated in PMI (2017), the success rate of a project should be measured against the achievement of project goals and objectives making the measurement of project success specific to each project, and in the pursuit of clearly documenting measurable project objectives, key stakeholders of a project should answer the three (3) questions as listed below:

> *"What does success look like for this project?*
> *How will success be measured?*
> *What factors may impact success?"*
> (Project Management Institute, 2017)

2.7.2 Tools to measure project success

Project management success can be assessed against the previously mentioned benchmarks of time, cost, quality, scope, resource and activity. Nevertheless, it can also be measured using models of measuring success like the Project Management Performance (PMPA) or maturity models of management used within organizations like the Project Excellence Model (Radujković & Sjekavica, 2017). Additionally, other criteria that is used in measuring project success is described in the sections that follow.

2.7.2.1 Project success criteria (PSC) and critical success factors (CSF)

According to Gomes and Romão (2016), PSC should be exclusive to each project and should ideally be determined by the stakeholders at the beginning stage of a project. On the other hand, CSF can be defined as a set of scenarios, factors or actions that aid in achieving the success criteria (PSC). In short, PSC is used in the measurement of project success while CSFs are the contributing factors to the achievement of success. Albert, Balve and Spang (2017) highlight that the assesment of project success with the use of project success criteria enables the comparison of projects besides acting as a basis for future developments pertaining project management processes. The table below is an example of the determined Project Success Criteria and Critical Success Factors of a selected project in the study conducted by Gomes and Romão (2016).

Table 2. 4: Project Success Criteria and Critical Success Factors (Source: Gomes & Romão, 2016)

Project Success Criteria	Critical Success Factors	
1. Time	1. Scope Control	2. Top Management Support
2. Cost	3. Team Engagement	4. Resource Availability
3. Technical Requirements	5. Risk Management	6. Business Opportunity
4. Customer Satisfaction	7. Market Impact	
5. Objectives Achievement	8. Financial Resources	

According to Silva, Warnakulasuriya and Arachchige (2016), the triple constraints were traditionally used as PSC but this has drastically evolved in the past few decades with authors including other factors such as project efficiency, impact on customer and organizational success amongst others as part of the project success criteria. The authors suggest that there is no general agreement over PSC and that it is continuously evolving. In the case of CSF, the term was first used in the project management context by Rockart (1982) whereby the author defined CSF as “those relatively small numbers of truly

important matters where a particular industry should focus her attention in order to achieve success".

2.7.2.2 Key Performance Indicators (KPIs)

A KPI is a quantifiable measure that is utilised to measure or make a comparison of performance with regards to meeting strategic and operational goals (Jahangirian, Taylor, Young & Robinson, 2017). The authors further add that the KPIs must be aligned with project objectives and this could be done by determining the CSFs first. Chan, Scott and Chan (2004) had introduced a set of KPIs in order to measure project success by which they divided it into Objective Measures which are based on mathematical formulae and Subjective Measures which are more towards getting personal judgement of stakeholders with the measurement of a scale, as shown in Figure 2.3 below.

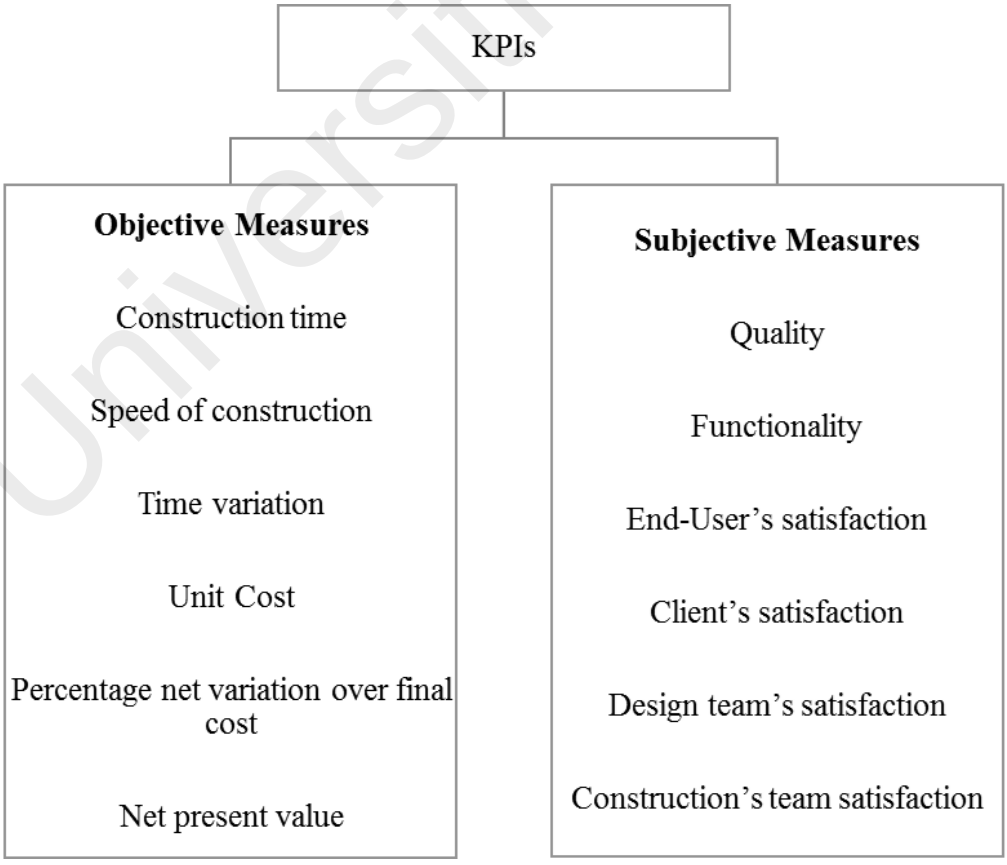


Figure 2. 3: KPIs for Measuring Project Success

Source: (Chan, Scott, & Chan, 2004)

2.7.3 Project management success factors

Project management success factors are the elements that contribute to project management success and thus, overall project success. Radujković and Sjekavica (2017) in their study on Project Management Success Factors identified eight (8) project management success factors that have been classified into three (3) categories as shown in Table 2.5 below. The authors consider these factors as enablers or influencers of project management success.

Table 2. 5: Project Management Success Factors by Category (Source: Radujković & Sjekavica, 2017)

Category of project management success factors	**Factors of project management success**
Aspects of project management competence	Competency of the project manager
	Emotional intelligence and soft skills of project manager
	Project team competency
	The application and coordination of project management skills and knowledge by project manager and project team
Aspects of organization	Structure of the organization
	Culture of the organization
Aspects of project management methodologies, methods, tools and techniques	Project management tools and techniques
	Standards of project management

Whereas, Serrador and Turner (2014) in their research on the relationship between project success and project efficiency, identified success factors with relevance to five dimensions of project success as shown in the Table 2.6 below.

Table 2. 6: The five dimensions of project success
(Source: Serrador & Turner, 2014)

Success Dimensions	**Measures**	**Time/ Phase**
Project Efficiency	Achieving schedule goal	Project end
	Achieving budget goal	
Team Satisfaction	Morale of the team	Project end
	Development of skills	
	Growth of team members	
	Retention of team members	
Customer Impact	Achieving functional performance	Months following completion of project
	Achieving technical specification	
	Fulfilment of customer requirements	
	Solving customer issues	
	Product is used by customer	
	Satisfaction of customer	
Business Success	Commercial success	Years following completion of project
	Creation of a large market share	
Preparation for the future	Generating a new market	Years following completion of project

There is a long list of success factors as described by various researchers. With reference to the literature reviewed above, it can be summarized that the project success factors (PSF) should be taken into consideration in the case of this study as it focuses on studying the impact of project management on the success of interior design projects. The success factors determined by Radujković and Sjekavica (2017) are comparable to the first three

(3) success dimensions determined by Serrador and Turner (2014) as well as with KPIs for measuring project success as developed by Chan, Scott and Chan (2004). Therefore, the success dimensions that will be used in this study to measure interior design project success will include Project Efficiency (schedule and budget), Health and Safety, Quality, Functionality, Client / End-user's satisfaction, Design team's satisfaction and Construction team's satisfaction.

2.8 Summary

In summary, the issues mentioned in the previous section are all relative to management of projects, scope of work, stakeholder issues, project monitoring, cost and schedule overrun and financial feasibility. These refer to the ten knowledge areas in Project Management Book of Knowledge (PMBOK) where there is a need to place emphasis on project integration management specifically in the context of interior works and interior designers (Mustapha et al., 2013). Besides that, the literature review shows insufficient documented knowledge and information with relation to the implementation of project management processes in interior design projects. The basic attention was mostly directed towards specific issues faced in the lifetime of interior design projects with studies on its possible solutions, but very little information has been found on the overall management processes of these projects to curb those issues. Hence, the latter being the general problem area of this research. Therefore, the aforementioned issues justify the need to conduct a study on the importance and use of project management by interior designers to increase project success since most of the issues stated are highly associated with management of projects in some way.

The objectives of this chapter, RO1: To explore the challenges and issues in the management of interior design projects and RO2: To examine the measure of success in interior design projects, are deemed to be completed in this chapter. The completion of RO1 and RO2 established the theoretical framework that the application of project management knowledge in interior design projects from the beginning would influence the project's success. The pre-determined project management processes framework in interior design projects and project success measurement will be used to test RO3 and RO4 in the subsequent chapters.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter will elaborate the method in which this research is designed and implemented with relevance to the aim, objectives and research questions as described in Chapter 1. In doing so, this chapter will elaborate on the research design, research approach and research techniques whereby:

a) Research design will discuss the available research types and the rationale for choosing one to ensure that the evidence obtained allows the research problem to be addressed effectively.

b) Research approach that will discuss the rationale of selecting a quantitative process of research over other methods.

c) Research techniques that will discuss the methods of data collection and analysis that will be used in this study.

3.2 Research Design

According to Saunders, Lewis, and Thornhill, (2009) research design is the overall arrangement of a research or study that involves questions pertaining the kind of evidence that is gathered and its source, and how that particular evidence is analysed in order to arrive at reliable answers to the initial research questions of the study. In summary, the research design is the generic plan on how the research questions of the study will be answered. Research design also encompasses the purpose of the research which can be characterized as either one of the following namely, Exploratory, Explanatory and Descriptive (Van Wyk, 2012). In the case of this study, the purpose of the study will be Explanatory as the aim of this research is to study the contribution of project management in interior design projects and its relationship to project success. This study emphasizes the need in studying a situation or a problem to be able to explain the relationships between variables of the study.

As this study is perceived to be deductive by nature whereby the research will begin with an extensive literature review that will aid in the formulation of a theory or hypothesis hence leading to the testing of the theory through a survey, the framework of this research will be broken into two parts as described below.

The first phase of this research project begins with the identification and development of the research topic. Firstly, a thorough literature review on topics of interest namely, interior design, project management and project success are carried out to identify the research topic. Further literature review on the research topic is conducted as part of a background study on the topic which allows the identification of issues with relation to the management of interior design projects. Based on the background study, the problem statement is identified and hence the research aim and objectives were determined.

At the same time, literature review is still conducted to identify the solutions to the issues identified in order to successfully complete an interior design project. At this stage, it was found that project management could be the possible solution to the issues identified while also possibly increasing project success rates. Therefore, information and findings with regards to the use of project management in interior design projects with relation to project success was gathered to justify the research aims and objectives of this study. Based on that, the next process was the development of research questions with relevance to the research objectives identified. Continued literature review allowed the identification of possible solutions to the research questions posed and in defining the project management process framework for interior design projects.

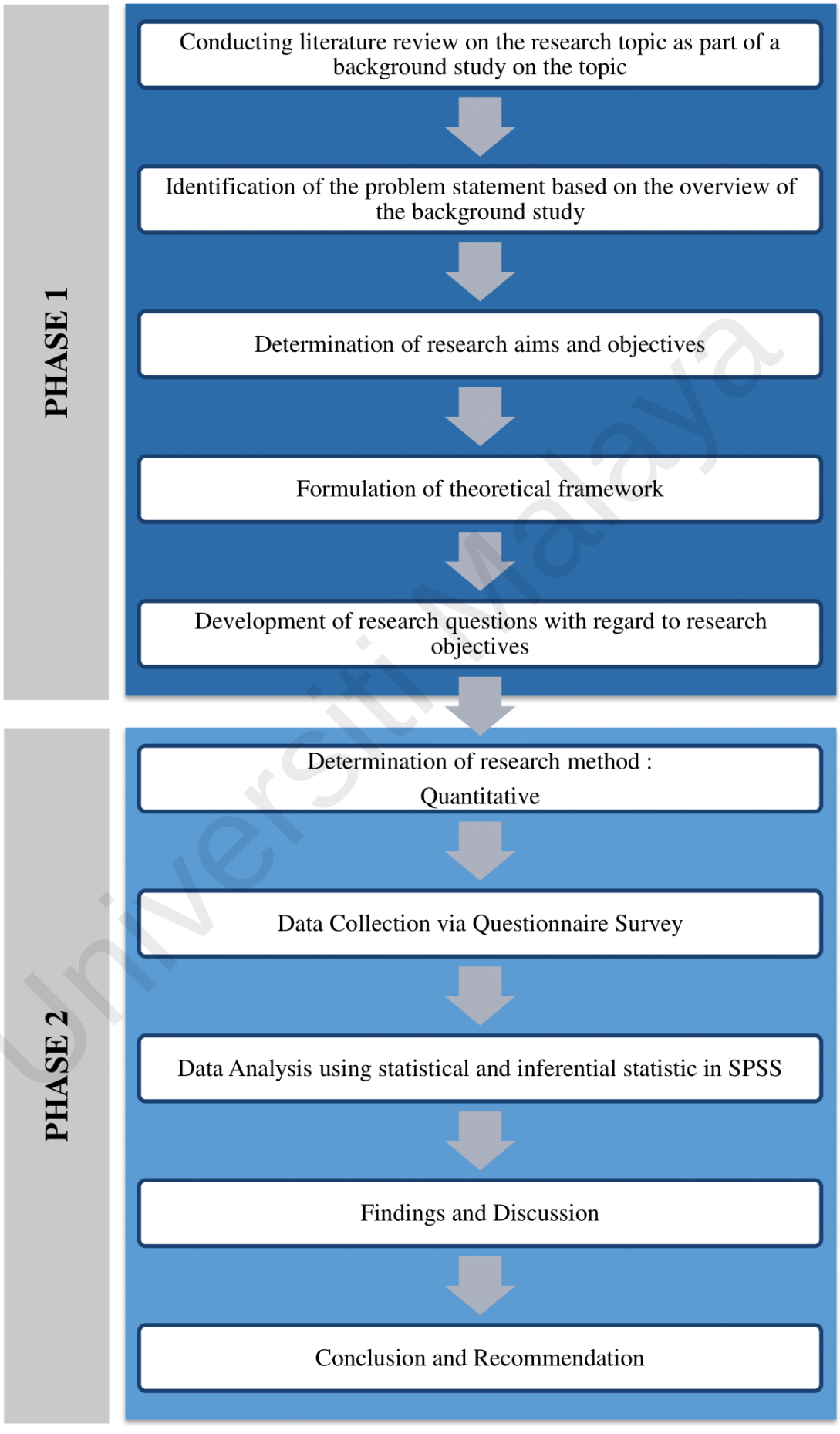
The second phase of this research encompasses the processes with relation to data collection and analysis. This study employed a quantitative data collection method using questionnaires that was formulated based on the information gathered from the literature review in order to address the relevant research questions. At the same time, the population and sample size were determined as explained in the sections that follow. Then, the questionnaire was created using Google Forms and distributed online via email and professional and social networking platforms such as LinkedIn and Instagram to selected respondents according to the identified sample population. A good questionnaire should be able to translate research questions so that precise answers can be obtained to fulfil research objectives (Ismail, 2016). Data was gathered within a stipulated timeframe and was analysed using statistical and inferential statistics in SPSS and discussed with reference to the relationship between project management processes in interior design projects with project success, in the following chapters.

Lastly, a comparison was made between the theoretical framework derived from the literature review carried out against data collected and analysed from the survey on the issues faced in the management of interior design projects as well as what do interior design professionals perceive project success as. This research then ends with a conclusion of the overall research and findings whereby significant findings, fulfilment of research objectives and research questions are elaborated. Also, recommendations for future research is made. The table below details the framework of the research with relevance to the research questions and is followed by a summary of the research process. The first part of the study will address Research Questions (RQ) (1) and (2). The second part of the study will address RQ (3) and RQ (4) as described in the table below.

Table 3. 1: Framework of research with relevance to research questions addressed

Phase of research	**Research Question(s) addressed**
Phase 1: Development of research topic	RQ1: What are the challenges and issues faced by interior designers in completing interior design projects? RQ2: How is success measured in interior design projects?
Phase 2: Data collection and analysis	RQ3: How is the project management process framework implemented in interior design projects in Malaysia? RQ4: How does the implementation of the project management processes influence the success of interior design projects?

Figure 3. 1: Research Process



3.3 Research Approach

This section will explain the research approach that will be undertaken in this study. Generally, there are three methods of research namely, Qualitative approach, Quantitative approach and Mixed method approach (Ismail, 2016). Creswell and Creswell (2017) describes the difference between Quantitative, Qualitative and Mixed method approaches whereby the aim of Quantitative research is to test a theory or specific hypothesis, or to explain the situation. This method is primarily used when a hypothesis is a proposition that may take the form of asserting a causal relationship or problem. Qualitative research on the other hand, aims to gain an understanding on the human and social activities rather than generalization. This method is used when the subject matter is subjective in nature and it requires a detailed investigation. As for Mixed-mode, Creswell and Creswell (2017) states that the method involves both the use of Quantitative and Qualitative methods. Ismail (2016) further adds that the overall strength of this method is greater than the two (2) other methods.

In the case of this research, the Quantitative method was selected as the research is designed in a manner where a theoretical framework is developed based on the findings in literature and hence it is tested and verified based on relevant data that is collected. Quantitative data will be required to deduce possible reasons that explains the relationships between the variables identified in this study. With reference to Saunders et al. (2009), the Quantitative method is suitable for this study as it is most frequently used to answer "who, what, where, how much and how many" questions. Table 3.1 below will provide further insight on why the Quantitative method was chosen for this study.

Table 3. 2: Research approach chosen with relevance to research objectives

Research Objectives	Research Approach	Data Collection Technique	Purpose
To explore the challenges and issues in the management of interior design projects.	Quantitative (What?)	Literature Review	• To understand the issues that are faced in managing interior design projects. • To understand the processes of interior design management.
To establish the measure of success in interior design projects.	Quantitative (What?)	Literature Review	• To understand the concept of project success. • To determine the success criteria used in interior design projects.
To examine the implementation of project management process framework for interior design projects in Malaysia.	Quantitative (What and How much?)	Questionnaire	• To determine the extent of implementation of project management processes in interior design projects in Malaysia.
To determine the relationship between the implementation of the project management processes in interior design projects and project success.	Quantitative (What and How much?)	Literature Review and Questionnaire	• To understand the definition project success in interior design projects. • To determine the relationship between project management processes and the success of interior design projects.

3.4 Research Techniques

There are several techniques of research based on the quantitative and qualitative research. Some of the techniques used in the Quantitative approach include Questionnaire and Interviews (Creswell & Creswell, 2017). There are different ways of selecting, picking or collecting written information and that is known as the data collection technique. Saunders et al. (2009) further adds that the most important thing is whether the chosen research technique will enable the researcher to answer the research questions posed and accomplish the research objectives stated.

3.4.1 Data Collection

This study will use the questionnaire method. Saunders et al. (2009) describes the questionnaire method as a data collection technique in which every respondent is required to respond to a same set of questions that is in a predetermined order. The rationale for selecting this method is as stated below:

a) As this study will first identify and develop the theoretical framework based on the findings in literature and then test it during the data collection process, the questionnaire survey will be a suitable method of data collection. Besides that, the variables that had been intended to be tested will also be pre-determined through literature review, thereby identifying the information that will need to be gathered from the respondents.

b) It was also found that previous research works such as that done by Ismail (2016) that studied project management against project success also used questionnaire for data collection. Besides that, other research works by Demirkesen and Ozorhon (2017) as well as Suresh and Sivakumar (2019) which studied the relationship of two

variables; project management and project success, also used questionnaire as their mechanism of data collection.

c) The questionnaire method has many advantages whereby as each respondent is asked to answer a fixed set of questions, it serves as an efficient way of collecting responses from a large sample before quantitative analysis (Saunders et al., 2009). Besides that, the questionnaire can also be designed to assist in the analysis stage.

d) Questionnaires are suitable for explanatory research such as this study as they enable the researcher to analyse and explain the relationship between variables studied particularly in the case of cause-and-effect relationships (Saunders et al., 2009).

3.4.1.1 Structure of the Questionnaire

The general structure of a questionnaire is very much associated with a good introduction, well-organized instructions, and a neat structure of questions for ease of response from the respondent. The questionnaire for this study has been divided into four (4) parts which include:

Part A : General Information of the respondent
Part B : Knowledge on Project Management
Part C : Presence of Project Management in Interior Design Projects
Part D : Project Success (determination of success factors and success measure)

The questionnaire was designed mainly using close-ended questions whereby respondents were required to choose from multiple-choice answers or to rate certain statements using the Likert scale. Closed-ended questions were primarily used for the

ease of quantitative data collection and analysis. Open-ended questions were only used in the segments where the respondents' opinion was required. The aim of the questionnaire was to answer both RO3: To examine the implementation of project management process framework for interior design projects in Malaysia, and RO4: To determine the relationship between the implementation of the project management processes in interior design projects and project success.

3.4.2 Research Sample

This subsection will describe the population, sampling design, sampling size and sampling frame used in this research.

3.4.2.1 Sample Population

The target group of the questionnaire were professionals and individuals who were involved in interior design projects, specifically in the design and implementation stages. Therefore, the target group mainly consisted of Professional Interior Designers and the numbers of individuals were gotten from the List of Registered Members (Interior Designer) by the Board of Architects Malaysia / Lembaga Arkitek Malaysia (LAM). LAM is a statutory authority that enforces the Architects Act 1967 whereas The Malaysian Institute of Interior Designers (MIID) is an organisation owned and governed by its elected members. Furthermore, MIID is the national institute that represents the interior design profession in this country and is the consolidation of the two previous bodies with relation to the interior design profession namely, Interior Designers Institute of Malaysia and the Malaysian Society of Interior Designers (MSID). LAM is a statutory body that governs the practice of interior design in Malaysia whereas MIID is an organisation that is owned and governed by its own members. In the case of this research, the sample population is taken from the MIID Members' Listings of Corporate members

and Associate members. These categories are chosen as members that can be registered with LAM are first required to be corporate members of MIID. Besides that, Corporate members and Associate members are required to have working experience in the interior design industry in order to gain their membership unlike the Student members, Graduate members and Academic members where working experience is not a pre-requisite. As this research focuses on the implementation of project management processes where project experience is required for data collection, the Corporate members and Associate members of MIID will be used as the sample population.

As it will be tedious to gather data from all the respondents identified in a population, sampling is done in a manner that it may truly represent the properties of the population. The table below summarizes the sample population of interior designers that was obtained from the relevant website at the time the sample population was determined.

Table 3. 3: List of Population

Population	**Quantity**	**Source**
Corporate Members	643	MIID website
Associate Members	92	MIID website
Total	735	

3.4.2.2 Sampling Design and Method

Based on the two available methods of Probability Sampling which is based on a random selection method that allows the researcher to make a strong inferential statistic of the whole population and Non-Probability Sampling which is based on a non-random selection method based on convenience or other relevant criteria, Probability Sampling is used due to the advantage where the selection of any one element is independent of the

selection of the other elements and the importance of representativeness of samples for wider generalizability (Ismail, 2016). Besides that, Saunders et al. (2009) also states that with the utilization of simple random sampling, the findings are considered representative of the whole population and this could be generated in more economical manner rather than collecting the data for the entire population. In this research, first the size of the population was determined and then the sample size was determined based on Krejcie and Morgan's table for determining sample size from a given population. After that, the questionnaire was distributed to the selected participants via email and professional and social networking sites such as LinkedIn and Instagram. However, the response rate was average during the initial stages of the distribution timeframe. Therefore, an additional questionnaire distribution to a network of interior designers was required as further elaborated in section 4.2 below.

3.4.2.3 Sampling Size

The sample size is imperative in determining the number of participants that will be used in the survey in order to ensure a statistically reliable result. Krejcie and Morgan's table for determining sample size from a given population was used in this research as shown below. With reference to Table 3.4 below, the population size identified was about 750 as shown in the given population. Therefore, the total sample required for the purpose of this research would be 254 samples.

Table 3. 4: Table to determine sample size based on a given population

N	*S*	*N*	*S*	*N*	*S*
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	1000000	384

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

Source: Krejcie & Morgan, 1970

Source: Krejcie and Morgan (1970)

3.4.3 Data Analysis

Quantitative analysis of data can be done using descriptive and inferential statistics (Saunders et al., 2009). Descriptive statistics converts raw data by reorganizing, ordering and manipulating data for complex interpretation whereas inferential statistics is deployed to determine whether the differences between the groups support the expectations or observations of a pattern. Some other examples of quantitative data analysis techniques

are graphs and charts. The analysis of the data collected for this study has been analysed using the statistical package for social science (SPSS) software. The data collected from the questionnaire is analysed using descriptive statistics (percentage and average mean) in sections where characteristics of the dataset only requires to be described. Inferential statistics (correlation analysis) is used where the data collected was analysed to determine the relationship between two variables and used to make predictions and generalizations about the larger dataset.

3.5 Summary

In summary, this chapter elaborated the overall research design of this study with a clear selection of the research type and presented the processes involved in carrying out this study. Besides that, this chapter also justified the selection of a quantitative research method by presenting the relevant reasons of the said selection. This chapter then ended with a detailed discussion on the research technique that will be employed in this study which encompasses details on data collection, research sample, population and summary of data analysis that will be used in order to obtain the findings of this research that will be presented in the next chapter.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data collected in this research. The data collected has been analysed using the Statistical Package for the Social Sciences (SPSS) software and is be presented in five (5) sections as follows:

a) General information and background of the respondents
b) Respondent's knowledge and perception of project management in interior design projects
c) Presence and practice of project management processes in interior design projects in Malaysia
d) Project success in the Malaysian interior design sector
e) Correlation between project management processes and project success

The data collection from the questionnaire survey was used to achieve RO3: To establish the implementation of project management process framework for interior design projects in Malaysia, and RO4: To determine the relationship between the implementation of the project management processes in interior design projects and its relationship with project success.

4.2 Response rate of the Questionnaire Survey

According to the sample size identified in Chapter 3, a total of 254 surveys were sent out through emails and direct messages via professional and social networking sites such as LinkedIn and Instagram. The questionnaires were sent to the selected participants from 14th June 2021 to 14th July 2021 where they were given a link to access the questionnaire. The response rate was average during the initial stages of the distribution timeframe. Therefore, an additional questionnaire distribution to a network of interior designers on LinkedIn (a business and employment-oriented online service) was required as an alternative to increase the response rate. 25th July 2021 was decided to be the deadline to accept responses for the questionnaire in order to proceed with the analysis of data.

The final response rate was 33.85% (86 respondents). The response rate is considered acceptable by benchmarking it with similar previous studies by Demirkesen & Ozorhon (2017) that achieved a response rate of 24% and Ismail (2016) that achieved a response rate of 14.2%. Details of the respondents with reference to their nature of business are presented in the table below.

Table 4. 1: Details of Respondents

Nature of Business	**Frequency (Number of respondents)**	**Percentage (%)**
Interior Design Consultancy	19	22.1
Interior Design & Build	52	60.5
Interior Design Contractor	10	11.6
Interior Product Supplier	3	3.5
Interior Architecture Consultancy	2	2.3
Total	**86**	**100.0**

4.3 Reliability Test

The reliability of the questionnaire was measured by testing its consistency with the Cronbach's alpha test in SPSS. According to Taber (2018), the Cronbach's coefficient alpha statistic is commonly used to measure and indicate the reliability of tests and scales (questionnaire) that have been used in the study is fit for purpose. The analysis is done by indicating that the same response pattern is shown by the subjects over the course of the questionnaire while also demonstrating the extent of correlation between items. Therefore, Cronbach's alpha is used to demonstrate that a certain questionnaire, test or scale that has been constructed for a research study is fit for its purpose. The resulting alpha coefficient of reliability is measured between 0 to 1 in providing this overall assessment of a measure's reliability. The table below shows the reliability test of the questionnaire survey in this research.

Table 4. 2: Reliability analysis using Cronbach's alpha value

Question	**Cronbach's alpha value**
Section B: Knowledge on Project Management	0.941
Section C: Presence of Project Management	
Section D: Project Success	

Based on the result shown above, the Cronbach's alpha value of the questionnaire is 0.941 which signifies an excellent internal consistency. The rule of thumb for interpreting the Cronbach's alpha value is shown in Table 4.3 below. Therefore, this suggests that the questionnaire survey is fit for its purpose and the data collected can be analysed accordingly.

Table 4. 3: Cronbach's alpha value

Cronbach's Alpha	Internal consistency
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

4.4 Background of respondents (Section A)

In analysing the statistical characteristics of the respondents' backgrounds, all the respondents were from the interior design sector in Malaysia. The respondents come from a range of company backgrounds such as interior design consultancy, interior design and build companies, interior contractors, interior suppliers as well as interior architecture consultancies that work on both interior design and architecture projects. The respondents also had different years of working experience ranging from one (1) to more than twenty (20) years and held different positions in their respective organizations. Majority of the respondents were Interior Designers which comprise of 62.8%. The other respondents held positions of Project / Design Directors (20.9%), Project Executives / Managers (10.5%), Technical Executive / Manager (2.3%), Architects (2.35) and Construction Manager (1.2%).

As for nature of business, majority of the respondents were from interior design and build companies which comprise of 60.5%. The remaining respondents were from interior design consultancies (22.1%), interior design contractors (11.6%), interior suppliers (3.5%) and architecture consultancies (2.3%). An interior design consultancy primarily

provides design services and then functions as the contract administer between the client and contractor whereas an interior design and build company provides both design and construction services therefore functioning as the designer and contractor in an interior design project.

Besides that, the respondents worked on a range of interior design projects. Majority of the respondents were involved with residential projects which make up 45.3%. The other respondents were involved with projects types of mixed development (37.2%), commercial (11.6%) and others which comprised of retail and hospitality (5.8%). The data presented above is summarised in the table below and signifies that there was participation from respondents who were from a variety of backgrounds with different work experience and types of projects worked on. This enables the generalization of findings towards the interior design sector in Malaysia.

Table 4. 4: Background of Respondents

Category	Item	No. of Respondents	Percentage (%)
Work experience	1 – 5 years	50	58.1
	6 – 10 years	17	19.8
	11 – 15 years	15	17.4
	16 – 20 years	1	1.2
	> 20 years	3	3.5
Level of education	Diploma	20	23.3
	Bachelor's Degree	54	62.8
	Master's Degree	12	14.0
Nature of business	Interior Design Consultancy	19	22.1
	Interior Design & Build	52	60.5
	Interior Design Contractor	10	11.6
	Supplier	3	3.5

	Other: Architecture Consultancy	2	2.3
Position in the company	Interior Designer	54	62.8
	Technical Executive / Manager	2	2.3
	Project Executive / Manager	9	10.5
	Construction Manager	1	1.2
	Project / Design Director	18	20.9
	Other: Architect	2	2.3
Types of projects	Residential	39	45.3
	Commercial	10	11.6
	Mixed Development	32	37.2
	Other: Retail & Hospitality	5	5.8

4.5 Perception of Interior Design Professionals towards Project Management in Malaysia (Section B)

In this section of the questionnaire, respondents were asked questions regarding their knowledge and perception with regards to the implementation of project management processes in interior design projects in Malaysia.

4.5.1 Contribution of project management

The questions were intended to find out the respondents' perception on the contribution of project management towards the successful execution of projects. Respondents were given a few criteria derived from PMBOK to which they were required to rate using a Likert scale of; 1=Strongly Disagree, 2= Disagree, 3=Neutral, 4= Agree, 5=Strongly Agree. Table 4.5 below presents the findings on the contribution of project management towards the successful execution of projects from the perspective of professionals from the interior design sector in Malaysia.

Table 4. 5: Contribution of project management

Criteria	Mean Score	Std. Deviation	Ranking (mean)
Meet business objectives	4.23	0.714	3
Satisfy stakeholder expectation	4.05	0.906	9
Increased chances of success	4.14	0.842	6
Timely delivery of projects	4.30	0.841	2
Resolve problems and issues	4.37	0.720	1
Response to risks in a timely manner	4.09	0.928	8
Optimized use of organizational resources	4.17	0.770	5
Identification, recovery and termination of failing projects	4.12	0.832	7
Management of constraints (scope, quality, schedule, cost, resources)	4.23	0.807	3
Better management of changes in projects	4.21	0.769	4

Referring to Table 4.5, the results show that the respondents agreed to the all the criteria enlisted as contribution of project management towards the successful execution of projects. This finding is in alignment with the findings of Badewi (2016) who states that project management practices influences project management success and at the same time affects project investment success. Similarly, Al-Hajj and Zraunig (2018) highlights that through an extensive literature review, there was not even one successfully completed project found to not have utilised at least basic project management practices. In this study, the highest mean score of 4.37 was recorded for *resolve problems and issues* and lowest mean score of 4.05 was recorded for *satisfy stakeholder expectation.* Besides that, respondents were also given an option to further elaborate on other contributions of project management processes based on their industry experience. The responses were as follows:

- Increases the quality of workmanship on site as well as the quality of the outcome (quality control)
- Aids in manpower allocation and site monitoring processes
- Reduces miscommunication between stakeholders
- Enhances workflow which in return enhances the quality of the end-product
- Provides some effect to resolving ambiguity in scopes of the project
- Feasibility aspects and value engineering (use of alternative methods and materials that cost lesser but do not interfere with the aspect of functionality)
- Better management of consultants and other parties (stakeholders)
- As a good case study or point of reference for other projects

4.5.2 Challenges in the management of interior design projects in Malaysia

The second question in Section B was regarding the difficulties encountered by respondents with regards to managing interior design projects. A list of issues faced in the management of interior design projects were identified through an extensive literature review as summarised in sub-chapter 2.5.7. Respondents were required to rate the frequency of which they encountered those issues to test the extent of occurrence of such problems in the interior design sector in Malaysia. Respondents were provided with a Likert scale of; 1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always. Table 4.6 below presents the findings on the issues encountered in managing interior design projects in the context of Malaysia.

Table 4. 6: Issues in interior design project management

Knowledge Area	Issues	Mean Score	Std. Deviation	Ranking (mean)
Scope	Unclear scope of work / overlapping scope of work	3.21	0.896	2

	Failure to fully understand client requirements	2.63	0.908	16
Schedule	Lack of standard indoor construction work system	2.90	1.063	10
	Progress monitoring issues	2.76	1.005	15
	Schedule overrun	3.35	0.979	1
Cost	Inability to determine the economic viability of projects	2.83	0.910	12
	Cost overrun	3.05	1.005	6
Quality	End-user dissatisfaction	2.55	0.807	17
	Quality Control (work defects, quality of furniture, fitting and equipment, quality of workmanship)	2.98	0.811	7
Risk	Low accuracy and efficiency in terms of quantitative measurements and calculations	2.63	0.798	16
	Technical defects	3.14	0.856	4
	Buildability issues	2.84	0.919	11
	Lack of safety awareness	2.95	0.880	8
Stakeholder	Design issues caused by other consultants' faults, disruptive workflow, client's demands or the designers itself	3.10	1.006	5
	Lack of coordination between multidisciplinary consultants/ contractors	3.14	0.960	4
Communication	Difficulties in communication	2.93	0.878	9
Change	Poor control in design/project changes	3.20	0.779	3
Resource	Organization / team members not being up to date with current technological software / technical knowledge	2.80	0.905	13
	Designers have a lack of knowledge pertaining to the concepts of management	2.78	0.925	14

Table 4.6 shows that seven (7) of the issues as highlighted in red have a mean score of 3.00 and above which indicates that respondents encountered those issues 'Sometimes' and most commonly in comparison to all the other issues listed. Those issues fall into the knowledge areas of Scope Management, Schedule Management, Cost Management, Risk Management, Stakeholder Management and Change Management. Overall, the highest mean score of 3.35 was recorded for *Schedule Overrun* while the lowest mean score of 2.55 was recorded for *End-user dissatisfaction*. This signifies that interior design professionals in Malaysia face the same issues as highlighted by the various authors as described in sub-chapter 2.5.7. Besides that, respondents were also given an option to further elaborate on other issues faced in managing interior design projects based on their industry experience. The responses were as follows:

- Interference of unauthorized persons (i.e. clients or consultants) in the decision-making process on construction work whereby instructions are given to contractors/suppliers without the approval of the project manager
- Issues with convincing clients on the value of the project
- Poor documentation which leads to final close-out issues
- Design concept (client's expectation) with relevance to budgetary constraints as well as changes in client's requirements
- Uncooperative contractors

In summary, it can be deduced that the respondents agreed on the importance of project management processes in contributing to the successful execution of projects. Additionally, it can be deduced that there are issues faced in the lifetime of interior design projects in the Malaysian context with relevance to the management of projects. However, these were found to occur occasionally with some issues being more common than others.

4.6 Presence of Project Management in Interior Design Projects in Malaysia (Section C)

In this section of the questionnaire, respondents were asked to select answers that best reflect the current project management practices in their organization. The questions were intended to find out the presence of project management processes and its frequency as practiced in interior design organizations in Malaysia.

4.6.1 Project Planning and Monitoring

In the first part of this section, respondents were asked questions regarding the current project management practices in their organization which included project planning and monitoring approaches. The results are presented and discussed in the tables below, beginning with project planning approach.

Table 4. 7: Project Planning Approach

Planning Approach	No. of Respondents	Percentage (%)
Planning in detail in the early stage then revised if required	42	48.8
Developed by iteration (The project is divided into periods of time, usually from two to six weeks)	22	25.6
Planning in macro in the early stage then detailed in each phase of project	20	23.3
Depends on scale of project	2	2.3

Table 4.7 shows that most of the respondents (48.8%) planned in detail during the early stages of the project and then revised the project plan if required. This signifies that most of the respondents defined the basis of all project work and the way they will be performed at the early stages of the project, which as stated by Freitas, Silva, Campilho, Pimentel,

and Godina (2020) is a traditional predictive project management approach that involves planning everything upfront and then controlling and adjusting when needed, throughout the course of the project timeline. Additionally, Noorhani and Mustapha (2021) highlighted that a thorough project plan should be prepared, its progress tracked efficiently and communicated with the relevant stakeholders as a failure to do so may result in schedule delays and budgetary setbacks. Meanwhile, 23.3% of respondents planned in macro in the early stages of the project then detailed their planning in each phase of the project, while 25.6% of the respondents developed their project plan by iteration. These approaches are similar to the more pared-down, focused approach at the beginning of the project, combined with the flexibility to revise as the project progresses as suggested by Sicotte and Delerue (2021). Two (2) respondents did not select the options given but instead responded that their project planning approach depended on the complexity of the project as small scaled and short termed projects did not require developing a detailed project network.

Table 4. 8: Person responsible for project planning and monitoring

Criteria	Person(s) responsible	No. of Respondents	Percentage (%)
Project Planning	Project management office (PMO)/ a department	9	10.5
	Project Manager	21	24.4
	Project Designer	23	26.7
	Shared responsibility between project team members	33	38.4
Project monitoring	Project management office (PMO)/ a department	12	14.0
	Project Designer	21	24.4
	Shared responsibility between project team members	26	30.2
	Project Manager	27	31.4

In the case of project planning, the results in Table 4.8 show that most of the respondents (38.4%) stated that project planning was a shared responsibility between project team members. This signifies that there is no one person who is responsible for the project planning. This is followed by Project Designer (26.7%), Project Manager (24.4%) and Project management office (PMO) / department (10.5%). Where project monitoring is concerned, the Project Manager was mostly shown to be the person in charge with 31.4%. This is followed by a shared responsibility between project team members (30.2%), Project Designer (24.4%) and Project management office (PMO) / department (14.0%). 23 respondents stated that the Project Designer is responsible for the project planning while 21 respondents stated that the Project Designer was responsible for project monitoring, therefore, supporting the findings of Noorhani and Mustapha (2021) that project management skills as well as design skills are both required for interior designers to carry out their projects effectively.

4.6.2 Stakeholder Involvement

In the next part of Section C, respondents were asked questions relating to the involvement of stakeholders in the different phases of the project as “design issues caused by other consultants’ faults, disruptive workflow, client's demands or the designers itself” and “lack of coordination between multidisciplinary consultants / contractors” were identified as challenges faced in the management of interior design projects during the literature review phase of this study. Table 4.10 below shows the involvement of stakeholders with reference to different stages in a project.

Table 4. 9: Stakeholder involvement in a project

Frequency	No. of Respondents	Percentage (%)
Not involved	1	1.2
Design phase only	13	15.1
Planning phase only	1	1.2
Pre-construction phase only	11	12.8
Construction phase only	23	26.7
All project phases	37	43.0

Referring to Table 4.10, the results show that many of the respondents had stakeholders involved in all project phases (43.0%). However, the rest of the respondents stated that stakeholders were only involved in certain phases of the project which amounts to 57.0%, out of which only 1.2% responded that stakeholders were involved in the planning phase. This signifies that over half of the interior design professionals in Malaysia did not involve all stakeholders in all phases of the project. de Oliveira and Rabechini Jr (2019) highlights that it would be difficult to achieve the objectives of the project without participation of people either directly or indirectly as a project is typically a social activity where the establishment of relationships, communication and leadership are important. Besides that, Srinivasan and Dhivya (2020) state that positive commitment between various stakeholders and team members involved in a project can be created through adequate stakeholder participation thus enabling project success whilst increasing performance. Also, Lundmark (2020) highlights that in design and development projects, stakeholder participation provides information to the design as the user's perspective is considered. This signifies that stakeholder involvement is crucial in ensuring better project efficiency and ultimately project success.

4.6.3 Interior Design Work Development Process

In this part of the questionnaire, respondents were asked to rate the interior design work development process (project management process framework) as practiced in their respective organizations. Relative to that, after an extensive literature review the RIBA Plan of Work was decided to be used as a theoretical framework to study the implementation of project management process framework for interior design projects in Malaysia. The RIBA Plan of Work consists of eight stages starting from Strategic Definition up to Use. A Likert scale of; 1=Never, 2=Rarely, 3=Occasionally / Sometimes, 4=Almost every time, 5=Frequently was used to test the level of practice of each process. Table 4.11 below presents the findings on the implementation of interior design work development process that is representative of the interior design sector in Malaysia.

Table 4. 10: Interior design project management process framework

Stage	Process	Mean Score	Std. Deviation
1: Strategic Definition	Preparation of client requirements	4.43	0.712
	Development of business case for feasible options including review of project risks and project budgets	3.91	0.806
	Confirmation of option that best delivers client requirements	4.30	0.798
	Review of feedback from previous projects	3.92	1.008
	Site appraisal	4.06	0.817
2: Preparation and Briefing	Preparation of project brief including project outcomes and sustainability outcomes, quality aspirations and spatial requirements	3.95	0.880
	Feasibility studies	3.74	0.910
	Confirmation on project budget	4.09	0.849
	Sourcing of site information including site surveys	4.06	0.886
	Preparation of project program	3.83	0.996

	Preparation of project execution plan	3.84	1.039
	Preparation of responsibility matrix	3.67	1.132
3: Concept Design	Preparation of design concept incorporating relevant requirements in alignment to cost plan, project strategies and outline specification	4.26	0.723
	Agreement on potential changes in project brief	3.97	0.860
	Design reviews with client and project stakeholders	4.36	0.766
	Preparation of design program	4.17	0.870
4: Spatial Coordination	Undertake design studies, engineering analysis (if any) and cost exercises to test design concept	3.63	0.971
	Completion of spatially coordinated design aligned to updated cost plan, project strategies and outline specification	3.94	0.899
	Initiation of change control procedures	3.87	0.918
	Review of design against building regulations or any other authority requirements	4.01	0.914
5: Technical Design	Development of technical design and drawings	4.27	0.726
	Preparation and coordination with design team on Building Systems Information	4.05	0.839
	Preparation and integration of specialist/ subcontractor Building Systems Information as part of final specification	4.03	0.789
	Preparation of construction program	3.98	0.907
6: Manufacturing and Construction	Finalisation of site logistics	3.76	0.957
	Manufacturing of building systems and commencement of construction	3.71	0.919
	Monitoring progress against construction program	4.07	0.794
	Inspection of construction quality	4.19	0.805
	Resolve site queries as required	4.17	0.843
	Undertake commissioning of project	3.76	0.981
	Preparation of defects list	4.10	0.868

	Preparation of building / operational manual (including health and safety file and fire safety information)	3.65	1.156
7: Handover	Hand over building in line with Plan for Use Strategy	3.95	0.944
	Review of project performance	3.87	0.980
	Seasonal commissioning as required	3.70	0.946
	Rectification of defects	4.19	0.833
8: Use	Appointment of facilities management and asset management teams, and strategic advisers as needed	3.33	1.173
	Implementation of facilities management and asset management	3.35	1.156
	Post occupancy evaluation of building performance in use	3.48	1.049
	Verification of project outcomes	3.69	1.109
	Update of building manual (including as-built drawings)	3.67	1.111

Table 4.11 shows that the mean value for the processes in all the stages of the project falls between 3.33 (lowest mean value) and 4.43 (highest mean value) which signifies that project management processes were being practiced *Occasionally / Sometimes* to *Almost every time*. Project stages 1: Strategic Definition, 3: Concept Design, 5: Technical Design and 6: Manufacturing and Construction indicate that over 50% of the processes in each of these stages has mean values of more than 4.00 which shows that these processes are practiced almost every time (as highlighted in Table 4.11). Meanwhile, project stage 8: Use recorded the least mean values of overall. This indicates that project management processes in this stage of the project were the least practiced as compared to the other stages.

Besides project management processes, respondents were also about tools and standards that they use to manage projects. Respondent were provided with a list of seven (7) tools

and standards to select from besides being given the option to name other tools and standards that they utilized in managing projects that were not stated in the list provided.

Table 4. 11: Tools and standards to manage projects

Tools and Standards	No. of Respondents	Percentage	Rank
Microsoft Project	40	46.5	1
Architects Act 1967 (Act 117) & Rules	37	43.0	2
PMBOK Guide	13	15.1	3
BIM (Building Information Modelling)	11	12.8	4
Microsoft Excel	8	9.3	5
RIBA Plan of Work Toolbox	8	9.3	5
Last Planner System of Production Control	5	5.8	6
Others: Asana, ISO project, manual	5	5.8	7

Table 4.12 above shows the list of tools and standards used by the respondents, ranked in order of most used to least used. The findings indicate that Microsoft Project was the most used project management tool (46.5%) and Last Planner System of Production Control was the least used project management tool (5.8%). Respondents also listed 3 other tools and methods that they used in managing projects which were Asana, ISO project monitoring system and manual method. Besides that, despite the British Institute of Interior Design (BIID)'s suggestion that the RIBA Plan of Work to be an excellent resource for interior designers as it provides a valuable insight on a project's workflow right from the beginning to the end of a project (British Institute of Interior Design, 2021), the findings show that only 9.3% of the respondents used this tool. Thus, indicating that this tool has not been adopted much in the interior design sector in Malaysia.

In summary, in can be concluded that project management processes in interior design projects was not comprehensively practice in Malaysia. The data collected on the implementation of the said processes indicates that most of the processes were ranked under *Occasionally / Sometimes* as shown in Table 4.11. The mean values for stages 2: Preparation and Briefing, 4: Spatial Coordination and 8: Use indicated that most of the processes in these stages were not practiced as much as those in stages 1: Strategic Definition, 3: Concept Design, 5: Technical Design and 6: Manufacturing and Construction. A summary of the project management processes that were mostly practiced in interior design projects in Malaysia is shown in the table below.

Table 4. 12: Interior Design Project Management Processes Practiced in Malaysia

Stage	**Process**
1: Strategic Definition	Preparation of client requirements
	Confirmation of option that best delivers client requirements
	Site appraisal
2: Preparation and Briefing	Confirmation on project budget
	Sourcing of site information including site surveys
3: Concept Design	Preparation of design concept incorporating relevant requirements in alignment to cost plan, project strategies and outline specification
	Design reviews with client and project stakeholders
	Preparation of design program
4: Spatial Coordination	Review of design against building regulations or any other authority requirements
5: Technical Design	Development of technical design and drawings
	Preparation and coordination with design team on Building Systems Information
	Preparation and integration of specialist/ subcontractor Building Systems Information as part of final specification

6: Manufacturing and Construction	Monitoring progress against construction program
	Inspection of construction quality
	Resolve site queries as required
	Preparation of defects list
7: Handover	Rectification of defects

4.7 Project Success in the Malaysian Interior Design Sector

In the last part of the questionnaire, respondents were asked questions regarding their knowledge and perception with regards to project success. The questions were also intended to find out how project success is measured in the interior design sector in Malaysia as well as the performance of projects with relevance to a list of success criteria.

4.7.1 Documentation of Project Objectives in Interior Design Projects in Malaysia

In the first part of this section, respondents were asked to rate how clearly project objectives are documented in their respective organizations. Respondents were given a few criteria to which they were required to rate using a Likert scale of; 1=Poor, 2=Fair, 3=Good, 4=Very Good, 5=Excellent. Table 4.13 below presents the findings on the documentation of project objectives as practiced in interior design firms in Malaysia.

Table 4. 13: Documentation of project objectives

Criteria	Mean Score	Std. Deviation
What does success look like for this project?	3.73	0.913
How will success be measured?	3.78	0.900
What factors may impact success?	3.65	0.904

What does success look like for this project? refers to the documentation of success criteria or determinants of success; *How will success be measured?* refers to how the success criteria of the project will be measured and; *What factors may impact success?* refers to aspects or elements related to the project that may influence project success. With reference to Table 4.13, the mean values for all the criteria fell above 3.00 which signifies that project objectives were documented at a *Good* level. The highest mean score of 3.78 was recorded by the criteria; *How will success be measured?* Therefore, it can be deduced that the respondents placed the most importance on how the success criteria of the project will be measured as highlighted by Joslin and Müller (2016) that different stakeholders may perceive project success differently and therefore, it is crucial to define the success criteria at the initiation stage of the project in order to form a common understanding.

4.7.2 Perception of project success of interior design professionals in Malaysia

Dvir et al. (2003) states that the success of a project may vary depending on subjective, individual judgment and in their study, they perceive success through the satisfaction of the main stakeholders involved in the project. Similarly, Davis (2017) reiterates the importance of all stakeholders to have the same perception of success dimensions in a project. Thus, this section of the questionnaire is intended to find out how project success is defined from the perspective of professionals from the interior design sector in Malaysia. A list of determinants of project success were derived through literature review. A Likert scale of; 1=Strongly Disagree, 2= Disagree, 3=Neutral, 4= Agree, 5=Strongly Agree, was used to test the level of agreement of respondents. Table 4.14 below presents the findings on the definition of project success as perceived by interior design professionals in Malaysia.

Table 4. 14: Definition of project success

Project Success Determinants	Mean Score	Std. Deviation
Project efficiency (schedule and budget are met)	4.24	0.796
Impact on the customer (expectations met, customer satisfaction)	4.43	0.712
Functional requirements are met	4.35	0.699
Technical requirements are met	4.33	0.774
Business success (commercial success)	4.15	0.678
Team satisfaction (team morale and skill development)	4.07	0.968

Referring to Table 4.14, the mean values for all the project success determinants fell above 4.00 which signifies that respondents *Agree* with all the six (6) determinants proposed in the questionnaire. *Impact on the customer* which includes client's expectations satisfaction was found to be the determinant with the highest mean score (4.43) while *Team satisfaction* recorded the lowest mean score (4.07). This is similar to the findings of Suresh and Sivakumar (2019) whereby a project is considered effective when the full satisfaction of the users is achieved by meeting all the objectives of the project and all designated interests of the project such as sponsors and initiators who accept the results of the project and hence close the project officially. Additionally, Sanjuan and Froese (2013) as well as Joslin and Müller, (2016) state that a project is considered successful when stakeholders' requirements and expectations are met and this is usually when a project is completed within schedule or on time, within budget and within the planned scope and quality.

4.7.3 Interior Design project performance

The last part of the questionnaire was intended to find out the project performance of the respondents' projects. KPI's of project success was used as the tool to measure the

performance of projects. Respondents were required to rate their project performance using a Likert scale of; 1=Poor, 2=Fair, 3=Good, 4=Very Good, 5=Excellent. Table 4.15 below presents the findings on the performance of interior design projects in the context of Malaysia.

Table 4. 15: Interior design project performance

Criteria	Mean Score	Std. Deviation
Project Efficiency (Cost and Schedule)	3.87	0.720
Health and safety	3.93	0.837
Quality	4.03	0.758
Functionality	4.13	0.748
Client / End-user's satisfaction	4.20	0.764
Design team's satisfaction	3.93	0.865
Construction team's satisfaction	3.95	0.893

Table 4.15 shows that *Project Efficiency (Cost and Schedule)* recorded the lowest mean score which signifies that projects performed the least well in this aspect as compared to the rest. This is to relative to issues of schedule overrun and cost overrun recording mean scores above 3.0 as shown in sub-chapter 4.5.2. On the other hand, *Quality*, *Functionality* and *Client / End-user's satisfaction* recorded mean scores above 4.00 which shows that projects performed *Very Good* in these aspects.

In summarising Section D of the questionnaire, it can be concluded that all respondents agree with the determinants of project success as shown in Figure 4.1 below which is beyond the traditional measure of time, cost and quality. Besides that, projects were shown to perform the least in terms of *Project Efficiency* which includes cost and schedule thus, supporting the findings of Roh et al. (2011), Ismail (2016) as well as Kropp et al.

(2018) that schedule, cost overruns and progress monitoring were issues faced in managing interior design projects.

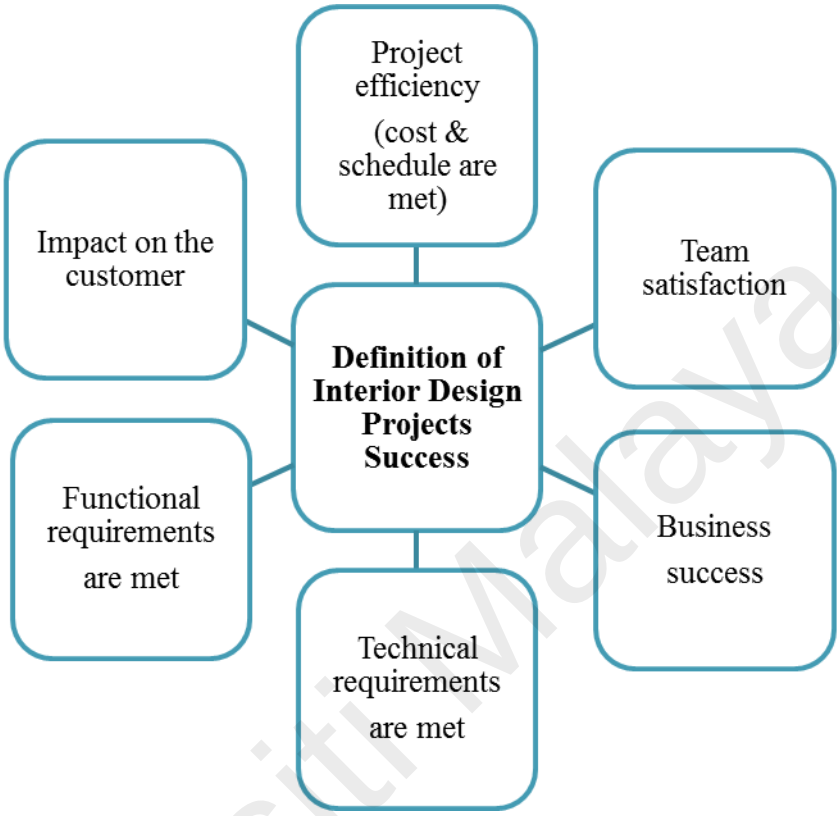


Figure 4. 1: Definition of interior design project success

4.8 The Relationship between Interior Design Project Management Processes and Project Success

This section is to determine the relationship between the implementation of the project management processes in interior design projects and its relationship with project success. Therefore, a correlation analysis was carried out to test the relationship between the variables. As both the variables to be tested were ordinal, the Spearman's rho correlation coefficient was used where the value r = 1 means a perfect positive correlation and the value r = -1 means a perfect negative correlation as shown in Figure 4.2. The rule of thumb for interpreting Spearman's correlation value as suggested by Pallant (2011) as shown in Table 4.16 was used to interpret the relationship between the variables. The

level of significance is expressed as p-value, and a p-value of less than 0.05 (typically ≤ 0.05) is statistically significant where this indicates strong evidence against the null hypothesis, as it shows a less than 5% probability that the null hypothesis is correct.

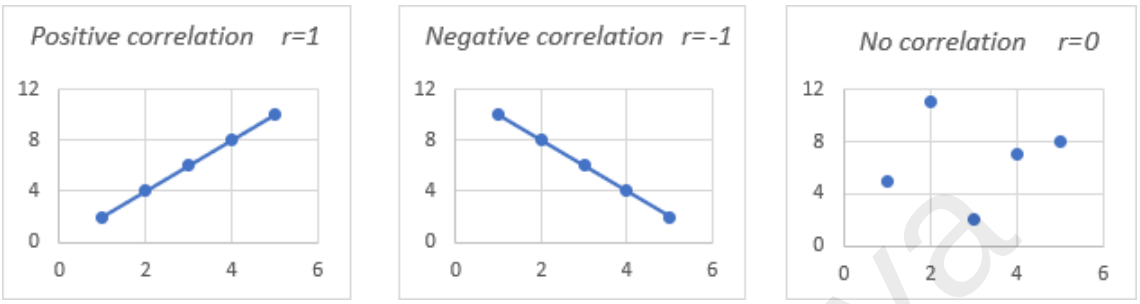


Figure 4. 2: Correlation coefficient, r
(Source: Cheusheva, 2021)

Table 4. 16: Rule of thumb for interpreting Spearman's correlation
(Source: Pallant, 2011)

Size of correlation	Interpretation
±.10 to ±.29	Small correlation
±.30 to ±.49	Medium correlation
±.50 to ±1.0	Large correlation

$H1_a$: There is a statistical relationship between the implementation of project management processes in interior design projects and project success.

$H1_0$: There is no statistical relationship between the implementation of project management processes in interior design projects and project success.

Hypothesis 1 was tested to establish if there was an association between the implementation of project management processes in interior design projects and project success. The Spearman Rho correlation results are shown in Table 4.17 below, where $H1_0$ (null hypothesis) was rejected at $p<0.05$ level of significance. The results showed a *medium correlation* between most of the project management process variables and project success variables (as highlighted in red). Large correlations are highlighted in blue. The relationship between implementation of project management processes at each project stage and its relationship with project success is further elaborated in the section that follows.

Table 4. 17: Correlation coefficient tested between the implementation of project management processes in interior design projects and project success

Project Management Process in ID projects \ Project Success Measure	Project Efficiency (Cost and Schedule)	Health and safety	Quality	Functionality	Client / End-user's satisfaction	Design team's satisfaction	Construction team's satisfaction
1: Strategic Definition							
Preparation of client requirements	.344	.109	.347	.509	.498	.388	.416
Development of business case for feasible options including review of project risks and project budgets	.297	.283	.341	.371	.256	.247	.276
Confirmation of option that best delivers client requirements	.446	.305	.336	.571	.484	.411	.457
Review of feedback from previous projects	.269	.150	.212	.342	.268	.291	.239
Site appraisal	.427	.249	.378	.456	.494	.412	.418
2: Preparation and Briefing							
Preparation of project brief including project outcomes and sustainability outcomes, quality aspirations and spatial requirements	.277	.184	.226	.411	.338	.280	.271
Feasibility studies	.327	.163	.290	.443	.404	.347	.363
Confirmation on project budget	.317	.222	.223	.374	.342	.212	.205
Sourcing of site information including site surveys	.408	.259	.310	.506	.475	.448	.488
Preparation of project program	.324	.147	.232	.356	.381	.361	.439
Preparation of project execution plan	.296	0.203	.288	.431	.410	.399	.457
Preparation of responsibility matrix	.303	.189	.227	.368	.310	.339	.419

3: Concept Design							
Preparation of design concept incorporating relevant requirements in alignment to cost plan, project strategies and outline specification	.353	.214	.234	.433	.394	.273	.268
Agreement on potential changes in project brief	.155	.154	.121	.296	.193	.108	.139
Design reviews with client and project stakeholders	.368	.359	.291	.508	.369	.137	.083
Preparation of design program	.191	.220	.209	.434	.266	.183	.177
4: Spatial Coordination							
Undertake design studies, engineering analysis (if any) and cost exercises to test design concept	.171	.177	.133	.203	.203	.202	.211
Completion of spatially coordinated design aligned to updated cost plan, project strategies and outline specification	.152	.215	.082	.247	.198	.139	.193
Initiation of change control procedures	.201	.265	.166	.377	.150	.137	.142
Review of design against building regulations or any other authority requirements	.278	.229	.172	.410	.225	.247	.262
5: Technical Design							
Development of technical design and drawings	.224	.084	.074	.297	.270	.168	.173
Preparation and coordination with design team on Building Systems Information	.289	.158	.155	.289	.322	.208	.201
Preparation and integration of specialist/ subcontractor Building Systems Information as part of final specification	.222	.192	.131	.336	.263	.200	.227
Preparation of construction program	.338	.239	.237	.413	.376	.299	.277

6: Manufacturing and Construction							
Finalisation of site logistics	.470	.307	.303	.419	.448	.331	.284
Manufacturing of building systems and commencement of construction	.465	.345	.295	.457	.354	.359	.340
Monitoring progress against construction program	.318	.228	.198	.244	.377	.277	.409
Inspection of construction quality	.399	.346	.287	.448	.482	.314	.396
Resolve site queries as required	.262	.251	.235	.431	.323	.220	.235
Undertake commissioning of project	.487	.457	.439	.478	.412	.403	.412
Preparation of defects list	.215	.237	.114	.319	.244	.223	.175
Preparation of building / operational manual (including health and safety file and fire safety information)	.387	.307	.274	.343	.349	.351	.269
7: Handover							
Hand over building in line with Plan for Use Strategy	.351	.297	.173	.419	.233	.278	.259
Review of project performance	.372	.345	.343	.491	.386	.442	.300
Seasonal commissioning as required	.391	.350	.284	.361	.375	.477	.440
Rectification of defects	.320	.198	.186	.424	.357	.333	.274
8: Use							
Appointment of facilities management and asset management teams, and strategic advisers as needed	.259	.256	.170	.177	.213	.175	.161
Implementation of facilities management and asset management	.250	.214	.154	.208	.148	.145	.137
Post occupancy evaluation of building performance in use	.188	.249	.186	.174	.162	.154	.133
Verification of project outcomes	.245	.362	.202	.225	.251	.165	.132
Update of building manual (including as-built drawings)	.183	.311	.170	.208	.128	.070	.020

4.8.1 The relationship between implementation of project management processes at each project stage and its relationship with project success

$H2_a$: There is a statistical relationship between the implementation of project management processes during the *Strategic Definition Stage* and project success.

$H2_0$: There is no statistical relationship between the implementation of project management processes during the *Strategic Definition Stage* and project success.

$H3_a$: There is a statistical relationship between the implementation of project management processes during the *Preparation and Briefing Stage* and project success.

$H3_0$: There is no statistical relationship between the implementation of project management processes during the *Preparation and Briefing Stage* and project success.

$H4_a$: There is a statistical relationship between the implementation of project management processes during the *Concept Design Stage* and project success.

$H4_0$: There is no statistical relationship between the implementation of project management processes during the *Concept Design Stage* and project success.

$H5_a$: There is a statistical relationship between the implementation of project management processes during the *Spatial Coordination Stage* and project success.

$H5_0$: There is no statistical relationship between the implementation of project management processes during the *Spatial Coordination Stage* and project success.

$H6_a$: There is a statistical relationship between the implementation of project management processes during the *Technical Design Stage* and project success.

$H6_0$: There is no statistical relationship between the implementation of project management processes during the *Technical Design Stage* and project success.

$H7_a$: There is a statistical relationship between the implementation of project management processes during the *Manufacturing and Construction Stage* and project success.

$H7_0$: There is no statistical relationship between the implementation of project management processes during the *Manufacturing and Construction Stage* and project success.

$H8_a$: There is a statistical relationship between the implementation of project management processes during the *Handover Stage* and project success.

$H8_0$: There is no statistical relationship between the implementation of project management processes during the *Handover Stage* and project success.

$H9_a$: There is a statistical relationship between the implementation of project management processes during the *Use Stage* and project success.

$H9_0$: There is no statistical relationship between the implementation of project management processes during the *Use Stage* and project success.

Referring to Table 4.17, null hypotheses $H5_0$ and $H9_0$ failed to be rejected at at $p<0.05$ level of significance as the correlation coefficent analysis showed no relationship between most of the variables. On the other hand, null hypotheses $H2_0$, $H3_0$, $H4_0$, $H6_0$, $H7_0$ and $H8_0$ are rejected as most of the variables in *Strategic Definition Stage, Preparation and Briefing Stage, Concept Design Stage, Technical Design Stage, Manufacturing and Construction Stage and Handover Stage* has a *significant relationship* with project success. It can be concluded that the implementation of specific project management processes is pertinent in contributing to the quality of the end-product, satisfaction of clients and end-users as well as completion within time and cost hence, contributing to project success as a whole.

Besides that, the results also show that certain project management processes have a *large correlation* with the project success measure of Functionality as summarised in the Table 4.18 below:

Table 4. 18: Processes that have a large correlation with project success

Project Stage	Project Management Process	Success Measure
1: Strategic Definition	Preparation of client requirements	Functionality
	Confirmation of option that best delivers client requirements	
2: Preparation and Briefing	Sourcing of site information including site surveys	
3: Concept Design	Design reviews with client and project stakeholders	

With reference to the processes of *Preparation of client requirements* and *Confirmation of option that best delivers client requirements*, an inference can be made that by carrying out these processes diligently, the functionality of the project can be achieved successfully as the success of an interior design project is determined by what extent the user's needs and desires have been met (Karaaslan & Yazıcıoğlu, 2015). Moreover, the *Sourcing of site information including site surveys* is crucial in determining the direction of the design scheme thus enabling a successful design (Shi, 2021). Hong (2012) further adds that it is crucial to carry out a comprehensive interior design survey in order to enable the designing of the space to be carried out effectively, as the interior environment should be designed based on the basis of improving the quality of the living environment. Lastly, *Design reviews with client and project stakeholders* relates to the involvement of stakeholders in the project. de Oliveira and Rabechini Jr (2019) as well as Srinivasan and Dhivya (2020) emphasized on the importance of the coordination of actions for stakeholder engagement and information collection with regards to their insights throughout the course of the project, to ensure project success. Therefore, it can be inferred that reviewing the design with clients and project stakeholders at stipulated intervals allows for a project that is successful in terms of functionality.

Furthermore, the results also show that three (3) project management processes have a *correlation with all the project success measures* as summarised in Table 4.19 below. Park-Lee and Person (2018) state that the most obvious manifestation with regards to issues pertaining client requirements involves uncertainties about the scope and outcome of design projects thus resulting in design consultants placing prime attention to establish their scope of work in projects. However, the authors further elaborate that specific phases and design outcomes are often undecided and subject to change. Therefore, it can be inferred that a *confirmation of an option that best delivers client requirements* does

correlate to all project success factors. Crowe, Mills, Poeling, Curtin, Bjørnskov, Fischer, and Granderson (2020) state that commissioning is a systematic process of verifying and documenting new and existing building systems if they operate as per design and the client's requirements. Therefore, it can be inferred that *Undertake commissioning of project* correlates to all project success factors as this process is representative of and relates to every aspect of the project. Lastly, *review of project performance* also means that each element of the project must perform according to the client's requirements and therefore this can be measured by all the project success factors as tested in this study.

Table 4. 19: Processes that have a correlation with all project success measures

Stage	Project Management Process
1: Strategic Definition	Confirmation of option that best delivers client requirements
6: Manufacturing and Construction	Undertake commissioning of project
7: Handover	Review of project performance

In summary, it can be deduced that most of the project management processes correlate to project success measures, therefore proving the importance of project management processes in contributing to the quality of the end-product, satisfaction of clients and end-users as well as completion within time and cost thus, contributing to project success as a whole.

4.9 Summary

The results from the questionnaire survey and its analysis were presented in this chapter. Thus, the objectives of this chapter, RO3: To examine the implementation of project management process framework for interior design projects in Malaysia and RO4: To determine the relationship between the implementation of the project management processes in interior design projects and project success, are deemed to be completed in this chapter. The findings of this study is concluded in the chapter that follows.

CHAPTER 5: CONCLUSION

5.1 Introduction

This chapter will summarize this entire study, present the significant findings, as well as revisit and discuss the fulfilment of the research questions, research objectives and aim of this study. Lastly, recommendations for the interior design sector as well as for future research will be provided.

5.2 Overall Summary

This research was carried out based on the existing scenario of project management in interior design projects both globally as well as within the context of Malaysia. Through an extensive literature review, it was found that there has been numerous researches on design theories, interior design education, characteristics of the interior design profession as well as on project management in general but little has been found on project management in the interior design sector and its contribution to overall project success. Further exploration in the interior design sector led to the discovery that there are numerous issues in the lifetime of an interior design project especially on interior scope of work and the management of the projects.

Hence, the aim of this research was to study the project management processes in interior design projects and its relationship to project success. The intention of this research was to focus on the challenges and issues in the management of interior design projects, the importance of project management processes and its impact on the successful completion of projects. In doing so, the deductive approach was used in this research whereby the theory was established first through an extensive literature review before empirical

research and analysis was based on the data collected in order to answer the research questions developed based on the issues identified in the literature review.

5.3 Significant Findings

This study identified these seven (7) significant findings as described below:

The most significant finding is that *schedule overrun* was found to be the most encountered issue in the management of interior design projects in Malaysia. The highest mean score of 3.35 was recorded indicating that this problem occurred the most in the interior design sector in Malaysia.

Secondly, interior design projects in Malaysia were shown to perform the least in terms of *Project Efficiency* which includes cost and schedule, in comparison to other performance measures. Based on the rating of the performance of the respondents' respective projects, *Project Efficiency* recorded the lowest mean score in comparison to the other project performance criteria. This finding also relates to the first significant finding above, whereby schedule overrun is the most encountered issue in the context of the Malaysian interior design sector.

Thirdly, project management processes in interior design projects is not comprehensively practiced in Malaysia. The mean value for the processes in all the stages of the project falls between 3.33 (lowest mean value) and 4.43 (highest mean value) which signifies that project management processes were being practiced *Occasionally / Sometimes* to *Almost every time*.

Furthermore, *Impact on the customer* was found to be the most important project success determinant. This project performance criterion was found to be the determinant with the highest mean score of 4.43 thus indicating that most of the interior design professionals in Malaysia place a heavier emphasis on this aspect when evaluating their project performance.

Next, interior design professionals *Agree* that the implementation of project management processes contributes to the successful completion of interior design projects. In finding out the respondents' perception on the contribution of project management towards the successful execution of projects, the highest mean score of 4.37 was recorded for the *resolve problems and issues* and lowest mean score of 4.05 was recorded for *satisfy stakeholder expectation.*

Besides that, the most employed planning approach was the traditional predictive project management approach whereby planning is done in detail in the early stage then revised if required. Most of the respondents (48.8%) planned in detail during the early stages of the project and then revised the project plan if required.

Lastly, it was found that there is no statistical relationship between the implementation of project management processes during the *Spatial Coordination Stage* as well as *Use Stage* with project success. The correlation coefficient analysis showed no relationship between the processes in the aforementioned stages with the project success determinants.

5.4 Revisiting the research questions (RQ)

After presenting the significant findings of this study, it is important to revisit the research questions as outlined in Chapter 1. The research questions are reflected on how these questions have been answered below.

RQ (1): What are the challenges and issues faced by interior designers in completing interior design projects?

The seven (7) challenges mostly pointed out by the respondents include unclear scope of work / overlapping scope of work, schedule overrun, cost overrun, technical defects, design issues caused by other consultants' faults, disruptive workflow, client's demands or the designers itself, lack of coordination between multidisciplinary consultants/ contractors as well as poor control in design/project changes. These seven (7) issues have a mean score of 3.00 and above which indicates that respondents encountered those issues *Sometimes* and most commonly in comparison to all the other issues listed. The respondents also listed other additional issues faced in managing interior design projects, namely; (1) interference of unauthorized persons (i.e. clients or consultants) in the decision-making process on construction work whereby instructions are given to contractors/suppliers without the approval of the project manager; (2) convincing clients on the value of the project; (3) poor documentation which lead to final close-out issues; (4) design concept (client's expectation) with relevance to budgetary constraints as well as changes in client's requirements; and (5) uncooperative contractors.

RQ (2): How is success measured in interior design projects?

The project success determinants used to measure project success in the interior design sector in Malaysia includes; (1) project efficiency (schedule and budget are met); (2) impact on the customer (expectations met, customer satisfaction); (3) functional

requirements; (4) technical requirements; (5) business success; and (6) team satisfaction (team morale and skill development). In testing the level of agreement of respondents, all these determinants had a mean score of more than 4.00 which indicated that respondents *Agree* to these determinants as the definition of project success.

RQ (3): How is the project management process framework implemented in interior design projects in Malaysia?

Project management processes in interior design projects is not comprehensively practiced in Malaysia. The frequency of implementation of most of the project management processes were ranked under *Occasionally / Sometimes*. Only project stages 1: Strategic Definition, 3: Concept Design, 5: Technical Design and 6: Manufacturing and Construction indicated that over 50% of the processes in each of these stages recorded mean values of more than 4.00 which shows that these processes are practiced almost every time.

RQ (4): How does the implementation of the project management processes influence the success of interior design projects?

Most of the variables in the *Strategic Definition Stage, Preparation and Briefing Stage, Concept Design Stage, Technical Design Stage, Manufacturing and Construction Stage* and *Handover Stage* has a significant relationship with project success. However, there is no statistical relationship between between the implementation of project management processes during the *Spatial Coordination Stage* as well as *Use Stage* with project success. Besides that, the processes of Preparation of client requirements, Confirmation of option that best delivers client requirements, Sourcing of site information including site surveys and Design reviews with client and project stakeholders has a large correlation with the project success measure of Functionality.

5.5 Fulfilment of Research Objectives (ROs) and Aim of the Study

With reference to the significant findings presented and the answered research questions as shown above, then the four (4) research objective of this study have been met. The following section reflects on how the research objectives have been met.

RO (1): To explore the challenges and issues in the management of interior design projects.

RO 1 required to find out the challenges and issues faces in managing interior design projects. Findings from the literature review spelled out a range of different issues faced. These issues where then tested on how frequently it occurred in the context of Malaysia. Besides that, respondents also gave additional information on other issues they faced. RQ 1 as described in the previous section aided the fulfilment of RO 1.

RO (2): To establish the measure of success in interior design projects.

Findings from the literature review detailed out the determinants of projects success and ways to measure project performance. With that theoretical framework, respondents were asked questions regarding their knowledge and perception with regards to project success. The questions were also intended to find out how project success is measured in the interior design sector in Malaysia as well as the performance on projects with relevance to a list of success criteria. RQ 2 as described in the previous section aided the fulfilment of RO 2.

RO (3): To examine the implementation of project management process framework for interior design projects in Malaysia.

After an extensive literature review, the RIBA Plan of Work was decided to be used as a theoretical framework to study the implementation of project management process

framework for interior design projects in Malaysia. Respondents were required to rate the level of practice in their organizations for each process segregated according to eight (8) project stages via an online questionnaire. Data analysis then showed that not all the project management processes in interior design projects were practiced comprehensively in Malaysia. Besides that, questions with relation to project planning and monitoring as well as stakeholder involvement which play a crucial role in the implementation of the project management process framework were asked to gain a better insight of the management of interior design projects in Malaysia. RQ 3 as described in the previous section aided the fulfilment of RO 3.

RO (4): To determine the relationship between the implementation of the project management processes in interior design projects and project success.

This objective was fulfilled through an inferential analysis which tested the correlation between each of the project management processes and project success measures. In conclusion, most of the project management processes correlate to project success measures, therefore proving that the proper implementation of project management processes influences project success which includes the quality of the end-product, satisfaction of clients and end-users as well as completion within time and cost thus, contributing to successful interior design projects as a whole. RQ 4 as described in the previous section aided the fulfilment of RO 4.

Finally, with the research questions answered and the objectives of this study being met, this research achieved its aim to study the implementation of project management processes in interior design projects and its relationship to project success.

5.6 Recommendations for future research

This research has been able to establish the level of implementation of project management processes in interior design projects as practiced in Malaysia. However, this was limited to the interior design professionals based in the main cities in Peninsular Malaysia. Therefore, it is recommended that future research is conducted with the inclusion of professionals from all states in order to get a better and clearer perspective. Besides that, the respondents of this study also identified additional issues they faced, besides those that were identified through the literature review. Future research can focus on the frequency of these issues and their relationship with project management processes.

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