THE STUDY ON THE USE OF PROJECT SUCCESS FRAMEWORK AMONG PROJECT PERSONNEL

JOSHUA ANAK SURING

FACULTY OF BUILT ENVIRONMENT
UNIVERSITY OF MALAYA
KUALA LUMPUR

2020

THE STUDY ON THE USE OF PROJECT SUCCESS FRAMEWORK AMONG PROJECT PERSONNEL

JOSHUA ANAK SURING

RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PROJECT MANAGEMENT

FACULTY OF BUILT ENVIRONMENT
UNIVERSITY OF MALAYA
KUALA LUMPUR

2020

UNIVERSITY OF MALAYA

ORIGINAL LITERARY WORK DECLARATION

Name of Candidate: JOSHUA ANAK SURING

Matric No: BQB180032

Name of Degree: MASTER OF PROJECT MANAGEMENT

Title of Research Project ("this Work"): THE STUDY ON THE USE OF PROJECT SUCCESS FRAMEWORK AMONG PROJECT PERSONNEL

Field of Study: PROJECT MANAGEMENT

I do solemnly and sincerely declare that:

(1) I am the sole author/writer of this Work;
(2) This Work is original;
(3) Any use of any work in which copyright exists was done by way of fair dealing and for permitted purposes and any excerpt or extract from, or reference to or reproduction of any copyright work has been disclosed expressly and sufficiently and the title of the Work and its authorship have been acknowledged in this Work;
(4) I do not have any actual knowledge nor do I ought reasonably to know that the making of this work constitutes an infringement of any copyright work;
(5) I hereby assign all and every rights in the copyright to this Work to the University of Malaya ("UM"), who henceforth shall be owner of the copyright in this Work and that any reproduction or use in any form or by any means whatsoever is prohibited without the written consent of UM having been first had and obtained;
(6) I am fully aware that if in the course of making this Work I have infringed any copyright whether intentionally or otherwise, I may be subject to legal action or any other action as may be determined by UM.

Candidate's Signature Date:

Subscribed and solemnly declared before,

Witness's Signature Date:

Name:

Designation:

THE STUDY ON THE USE OF PROJECT SUCCESS FRAMEWORK AMONG PROJECT PERSONNEL

ABSTRACT

Projects, programs and portfolios are essential for human endeavors since time immemorial. However, project success rates in various sectors are dismal and not up to expectations. This research aims to investigate the use of a multilevel project success framework among project personnel in various sectors to identify essential success levels and criteria and determine any weaknesses and gaps for enhancing the framework. This is a qualitative study during which a conceptual framework was developed and tested with data gathered using a questionnaire survey with open-ended questions which was distributed to project personnel based on snowball sampling. A total of 52 responses out of 500 questionnaires sent out were received, giving a response rate of 10.4%. The results found six levels and criteria of the project success continuum in addition to existence of the stakeholder and derived value continuums, several gaps in the use and weaknesses of the project success frameworks and thus the framework was enhanced by adding the input level, owner and sponsor and customer into the stakeholder continuum and operational value to the value continuum. Past researches show no agreement and consensus on a standardized and holistic project success framework, lack of empirical evidence of its relevance, completeness of its criteria and its practical utility and bifurcation between project management and project successes from the outcome and impact success levels. This research provides an enhanced multilevel project success framework with three continuums, the required empirical evidence for the framework and the integration of the bifurcated success continuum which can be used by project personnel to accomplish project success and organization performance excellence in general.

Keywords: Project success framework, Success criteria, Stakeholders, Value, Project Management.

KAJIAN PENGGUNAAN KERANGKA KEJAYAAN PROJEK PADA PERSONEL PROJEK

ABSTRAK

Projek, program dan portfolio sangat penting untuk usaha manusia sejak zaman berzaman. Walau bagaimanapun, kadar kejayaan projek di pelbagai sektor suram dan tidak menepati jangkaan. Penyelidikan ini bertujuan untuk menyiasat penggunaan kerangka kerja kejayaan projek bertingkat di kalangan personel projek di pelbagai sektor untuk mengenal pasti jurang dan kelemahan demi meningkatkan kerangka kerja. Ini adalah kajian kualitatif di mana kerangka konseptual dikembangkan dan diuji dengan data yang dikumpulkan menggunakan tinjauan soal selidik dengan soalan terbuka yang diedarkan kepada personel projek berdasarkan persampelan bola salji. Sebanyak 52 respons diterima daripada 500 soal selidik yang dihantar, memberikan kadar respons 10.4%. Hasilnya mendapati ada enam tahap dan kriteria kesinambungan kejayaan projek di samping kewujudan kontinum pihak berkepentingan dan nilai tambahan, beberapa jurang dalam penggunaan dan kelemahan kerangka kerja dan dengan itu, ia ditingkatkan dengan menambahkan tingkat input kepada kontinuum kejayaan, pemilik dan penaja, dan pelanggan kepada kontinum pihak berkepentingan dan nilai operasi kepada kontinum nilai. Penyelidikan lalu menunjukkan bahawa tidak ada kesepakatan mengenai kerangka kerja kejayaan projek yang standard dan holistik, kekurangan bukti empirikal mengenai relevansinya, kelengkapan kriteria dan utiliti praktikalnya, dan pengasingan antara kejayaan pengurusan projek dan projek daripada kejayaan keberhasilan dan keberkesanan. Penyelidikan ini menyediakan kerangka kerja yang standard dan holistik, bukti empirikal yang diperlukan dan penyatuan kontinum kejayaan terbahagi yang dapat digunakan oleh personel projek untuk mencapai kejayaan projek and organisasi.

Keywords: Kerangka kejayaan projek, Kriteria kejayaan, Pihak Berkepentingan, Nilai, Pengurusan Projek.

ACKNOWLEDGEMENTS

With this opportunity, I would like to express my appreciation and gratitude to my academic supervisor, Dr. Loo Siaw Chuing for her tireless and supportive guidance during the course of this research project and the panel members for their constructive feedback. I also like to thank all the respondents to my research questionnaire and all the lecturers for Master of Project Management at the University of Malaya. Last but not the least, many thanks to my family and friends who has offered encouragement and moral support throughout this course. Thank you to all!

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS AND ABBREVIATIONS

3E1C	:	Economy, Efficiency, Effectiveness and Cost-effectiveness
CF	:	Contingency factors
CM	:	Change management
CSF	:	Critical success factors
IPAT	:	Infrastructure Project Assessment Tool
IPOOI	:	Input, Process, Output, Outcome and Impact
IV	:	Independent variable
KPI	:	Key performance indicators
HLCSF	:	Holistic Life Cycle Success Framework
P3M	:	Project, program and portfolio management
PEHF	:	Project Evaluation Holistic Framework
PM	:	Project management
PS	:	Project success
PSC	:	Project success criteria
PSF	:	Project success framework
ROI	:	Return on Investment
SC	:	Success Criteria
SF	:	Success Factor
TOCF	:	Theory of Change Framework
VfM	:	Value for Money
BM	:	Benefits Management

LIST OF APPENDICES

Nil

CHAPTER 1: INTRODUCTION

Since time immemorial, humans have carried out major endeavours ranging from monuments, buildings to infrastructures which are called projects in modern time (Morris, 1994). Currently, there are three forms of the major endeavours which are known as project, program and portfolio that require strategic alignment with the organizational strategy which is cascaded down along the organizational hierarchy from top to bottom levels (Morris, 2004). Organizations whether businesses, public, private or nonprofit deploy their organizational strategy through strategic initiatives in the forms of projects, programs and portfolios. There are many reasons why these organizations employ project, program and portfolio management in addition to operations and other functions within its organization structure. According to the PMI's **PMBOK** ® Guide Sixth Edition (2017), the reasons cited for undertaking projects, programs and portfolios are as follows: to fulfill objectives by producing deliverables, drive change, enable value creation and respond to four factors of project initiation context. However, the picture of the end result of projects, programs and portfolios within organizations is not impressive when further readings show that there are low project success rates in industries or sectors. This problem has triggered this research project and thus, it shall focus on studying the use of a multilevel project success framework among personnel who participated or are involved in projects, programs and portfolios within various organizations, industries or sectors in Malaysia.

Project success is one of nine research areas in project management (Turner, Anbari and Braille, 2013). These starts from the iron triangle to critical success and failure factors, contingency variables, success criteria and then success frameworks. Judge and Muller (2005) reviewed the literature on project success between 1960s to 2000s and divided the 40 years timespan into four periods: Period 1: Project implementation and

handover (1960s-1980s), Period 2: CSF Lists (1980s-1990s), Period 3: CSF Frameworks (1990s-2000) and Period 4: Strategic Project Management (21 century).

Bannerman (2008) reviewed the literature on project success and divided them into three streams: the first and dominant stream focus on the influence of critical success factors on project success without explicit definition of project success, the second stream deals with the effect of contingency variables on project success which is again not explicitly defined and the third stream concentrates on defining the criteria, levels and frameworks of project success itself. The first two streams are concerned with the how to achieve project success while the third stream is occupied with what measures against which success or failure is judged. Bannerman contended that having a common definition of project success also facilitates agreement on whether, in the face of disparate interests and perspectives, success has been achieved. He emphasized that in the past, there has been an imbalance of attention on these three streams with more research carried out on "how to do it right" (the first two streams) at the expense of reaching any consensus on "doing the right thing" (the third stream). He further stressed that knowing how success is defined is a necessary precursor to determining where and how project effort should be focused to meet performance goals; and knowing where to focus project management effort is guided by an understanding of the drivers of project success and failure.

Later, Müller & Jugdev (2012) resumed their review of the literature on critical success factors in projects and the elucidation of project success. Notably, they continued to contend for strategic project management as well as entrepreneurial project management for innovations and new product development. Due to the voluminous literature available, this research shall concentrate on project success frameworks for there appears to be no agreement on a standardized and holistic format to define and measure project success for improving project success rates, benchmarking purposes and to evaluate project

contribution to economic value added and strategic alignment of organizations in industries or sectors.

1.1 Dismal project success rates

This research project has been triggered by readings of low project success rates in industries or sectors as listed below. It should be noted therein that only the two leading project management bodies report slightly above 50% of organizations surveyed claimed project success while the rest of the reports listed cite low project success rates as listed in Table 1.1 below. This problem wastes about $97 million for every $ billion spent (PIM, 2017). Thus, it should cause alarm among project personnel and becomes a challenge to them to find appropriate cures in order to improve the project success rates.

Table 1.1 Reports of dismal project success rates

Reference	Dismal project success rates
PMI's Pulse of the Profession (2017)	About 62% of organizations survey have a track record of success. Wasting about $97 million for every $1 billion spent.
Wellingtone (2018) supported by APM UK	Only about half of organizations surveyed have a track record of success (p. 20).
IPMA (2019)	Only 19% of organizations deliver successful projects, at least most of the time, 44% are likely to deliver projects that meet original goal and business intent, 30% are delivered on time and 36% on budget, 46% of projects are delivered with stakeholder satisfaction.
KPMG (2020)	53% of organizations had suffered one or more underperforming projects in the previous year that rose to 71% for natural resources companies. 91% of public sector respondents expected project failures.
McKinsey (2017)	Based on a dataset of more than 500 global projects above US $1 billion in resource industries and infrastructure, only 5 percent of projects were completed within their original budget and schedule. In the completed projects, the average cost overrun was 37 percent and average schedule overrun was 53 percent. If this performance continues, we will see a further US$5 trillion loss on the 3600+ currently planned megaprojects.

Deloitte (2018)	Only 54% of major projects deliver on time and within budget. US$109M is lost for every US$1B invested. US$46 trillion estimated global spend on I&CP up to 2030.
Flyvbjerg (2017)	Approximately 1 to 8 in a thousand projects is a success, defined as on target for all three criteria i.e. on cost, on time and on benefits.
Arcidiacono (2017)	Almost 25% of IT projects experience outright failure, 50% of projects require material rework and 20 to 25% of them do not provide Return on Investment (ROI).
UK Oil & Gas Authority (2016)	Since 2011, fewer than 25% of oil and gas projects have been delivered on time; with projects averaging 10 months' delay and coming in around 35% over budget while the levels of capital expenditure have been at an all-time high, averaging just over £12 billion compared to £3 to £6 billion annually (money of the day) through the last decade; and £1 to £2 billion annually on decommissioning.
CHAOS report (2015) by Standish Group	Less than a third of all IT projects were successfully completed.
Ernst & Young (2017)	Oil and gas industry-wide performance over the project development life cycle is poor, with 64% of projects over budget and 73% over schedule (p. 4).
Westwood Insight (2018)	Half of oil and gas fields are not producing to expectations when onstream, mainly due to unexpected reservoir issues.
PWC (2014)	Oil and gas exploration and production (E&P) companies experienced declining capital efficiency since 2005, as production has not kept up with development costs. Culprits include the need to look for oil and gas in challenging "frontier areas," increased difficulty in acquiring acreage, soaring input costs, and difficulty delivering large capital projects (LCPs) on time and within budget.
Merrow (2012) for Society of Petroleum Engineers	Only 22% of oil and gas megaprojects were successful versus half of non-E&P projects.
Merrow (2011) for industrial megaprojects	Only a third of out of 318 projects studied was successful.

1.2 Problem statement

This research is triggered by the dismal project success rates in various sectors as reported by numerous reports. The dismal project success rates present a challenge to those who participate and are involved in projects, programs and portfolios within organizations, those in academia and research and the project professional bodies. There are three key problems associated with assessment of project success rates in various sectors ant this research attempts to study and contribute to their resolution as briefly outlined next.

There is no agreement on a standardized and holistic project success framework by project, program and portfolio personnel and organizations for planning, appraising and evaluating project success at the multilevel of success and multi-tier of organizational hierarchy (de Wit, 1988; Shenhar et al, 2001; Bannerman, 2008; Elbaz & Sprang, 2020). Thus, it is required to develop and agree on a standardized and holistic multilevel project success framework. The multilevel success framework enables the cascading and strategic alignment of the organizational strategy with the strategies of project, program, portfolio, team and individual levels and management of success, stakeholders and value continuums at each of these organizational levels.

There is not much empirical evidence for the multilevel project success framework by Bannerman (2008) which appears the most advanced form among those reviewed. The framework is only conceptual and supported by six case examples, requiring more empirical evidence. The relevance and completeness of the criteria and the practical utility of the framework is yet to be tested by application, so its extent of use is not yet known. Hence, it is required to investigate the use of the framework to provide essential empirical evidence for the framework, to identify the vital success levels and criteria and determine

any weaknesses and gaps in its use among project personnel for enhancing the framework so that the enhanced version can be agreed upon and adopted.

There is a bifurcation not only in the project-product success management but also in the management of project, program, portfolio, organizational maturity and competence domains which have their own separate standards. This results in project management and project successes being separated from the outcome and impact successes as currently structured by leading bodies such as PMI and APM. This separation can disrupt the considerations of project contribution to the economic value added and strategic alignment to the organization (Graham & Cohen, 2001; Morris, 2005). Further, it can weaken the effort to consider the life cycle cost-benefit perspective of each asset based on the cradle to cradle concept as recommended by ISO 55000 (2014) and GPM Global P5 (2017). Therefore, the holistic project success framework shall consider success not only during project life cycle but also during the subsequent product life cycle based on the cradle to cradle concept.

The three problems highlighted above are significant because their existences affect or disable the integrated and continuous process of holistic success management and the essential performance comparison and benchmarking among projects, organizations and sectors. This benchmarking is required to enable sharing of best practices and continuous improvement of the dismal project success rates in various sectors. If these key problems are not resolved, it is expected that the project success rates will remain dismal and eventually, adversely affect the organizational performance over the long-term due to accumulated wastage and non-delivery of the intended outcome and impact to the organizations.

1.3 Research aim and objectives

The aim of this research is to investigate the use of a multilevel project success framework by identifying the essential success levels and criteria, and determining any weaknesses and gaps of the framework for enhancing it to be holistic and fit for use among project personnel who participate or are involved with projects, programs and portfolios within any organizations in various sectors. To achieve the aim, it involves three objectives as follows:

1. To identify the essential success levels and criteria of the multilevel project success framework
2. To determine any weaknesses of the framework and gaps in its use among project personnel in various sectors
3. To enhance the framework to be holistic and fit for use in various sectors

1.4 Research questions

1. What are the essential success levels and criteria of the multilevel project success framework?
2. What are the weaknesses of the framework and the gaps in its use among project personnel?
3. How can the framework be enhanced to be holistic and fit for use?

1.5 Scope of research

The scope of this research shall cover three areas related to the use of a multilevel project success framework used by personnel who participate or are involved in projects, programs and portfolios within any industries or sectors i.e. the levels and criteria of project success, any gaps in the use or weaknesses of the framework and to enhance the framework. It shall focus on project success criteria but exclude critical success factors

and contingency variables. The duration of the research is limited to the time allotted by the university. The location of the research is in Malaysia.

1.6 Significance of research

The whole output of the research which is the enhanced project success framework can be used by project, program and portfolio personnel and those who participate in or are involved in projects, programs and portfolios to improve the currently dismal project success rates in various organizations and sectors together with the operational personnel in accomplishing the intended value creation and strategic alignment along the organizational hierarchy. The project professional bodies can also adopt the enhanced framework and incorporate into their respective standards or guides in effort to improve project success rates. Higher project success rates result in less wastage due to dismal project performance, more value added by the project, program and portfolio management within the value chain and better strategic alignment within each organization. Ultimately, improved project success rates lead to higher value for money, better organizational performance and delivery of intended benefits as the outcome and derived value as the impact on organizations and the society in general.

The enhanced multilevel and multi-tier project success framework is fit for use after being investigated as per the following justification: 1) the weaknesses of the framework have been rectified by appropriate enhancements, 2) empirical evidence for its relevance, practical utility and completeness of its criteria and success levels has been obtained through the questionnaire survey and subsequent data analysis and more can be gathered by future research, and 3) the gaps in the use of the framework have been determined to exist and thus certain corrective actions can be taken by respective organizations such as adoption of a holistic project success framework, provision of training and development courses and integration of currently bifurcated success management and siloed domains

of project, program, portfolio, organizational maturity and competence management. Hence, agreement and adoption of the enhanced project success framework can provide a strategy for holistic success management and enables comprehensive assessment of project-product success rates among organizations and sectors so that comparison and sharing of best practices and performance benchmarking can be carried out for continuous improvement of project success rates up to satisfactory and excellent levels.

1.7 Layout of research project

Chapter 1: Introduction outlines the background and overview of the research. It covers areas such as the background of the research area, problem statement, research aim, objectives and questions as well as the scope and significance of the study.

Chapter 2: Literature Review presents a survey of literature on past researches on the topic of project success. Conscious efforts shall be made to study the evolution and components of the topic, namely critical success factors, contingency variables, success criteria and frameworks with criticism to identify the salient points and any deficiencies so that a holistic project success framework can be developed.

Chapter 3: Methodology explains the methodology that shall be employed in conducting the research, including the design approaches and methods used for determining the population and sampling size as well as the data collection and analysis.

Chapter 4: Results describe the data collection method and the process how the research is conducted. The data collected shall be analyzed in this chapter by the conscious use of the analytical tools mentioned in the methodology. Findings will be reported.

Chapter 5: Discussion interprets the findings by triangulation and comparison of the findings with other studies, discuss the implications for research and practice and

recommendations for addressing the key problems identified by the research and for improving project success rates in various sectors.

Chapter 6: Conclusion presents a summary of the findings of the research in relation to the research aim and objectives, highlight the research contributions and limitations and provide suggestions for further research.

References list all the publications used to gain insights to the development of this research.

CHAPTER 2: LITERATURE REVIEW

The literature review is focused on three relevant areas i.e. the problem statement or research gap, matching of similar project success frameworks into the generic theory of change framework and review of various project success frameworks to identify their strengths and weakness. These three actions enable the data synthesis and development of the conceptual project success framework as explicated below.

2.1 Previous studies on project success

The definition of project success has evolved from simply meeting the iron triangle (triple constraint) of scope, schedule and cost (Barnes, 2007), tetrahedral diamond (quadruple constraint) of scope, schedule, cost and quality, specifications or performance to multiple constraint of scope, schedule, cost, quality, resource and risk and then, from project management and project successes (de Wit, 1988) to multilevel success frameworks (Shenhar et al, 2001; Sutton, 2005; Bannerman, 2008; Elbaz & Spang, 2018) that is based on the basic theory of change i.e. input-process-output.

Extensive studies on project management have been conducted to improve project success rates and project contribution to organization performance excellence. Jugdev and Muller (2005) review the literature on project success since 1960s to 2000s and divided this into four periods: Period 1 on the iron triangle, Period 2 on critical success factor lists, Period 3 on success frameworks and Period 4 on strategic project management. Müller & Jugdev (2012) continued the review on elucidation of project success with focus on entrepreneurial project management for innovation projects such as by Martens et al (2018), Gemunden, Salomo & Krieger (2005) and Hoegl & Gemuenden (2001).

Bannerman (2008) states three main streams in the past studies of project success. The first and dominant stream aims to identify the factors that might contribute to project success, failure or risk such as by Baker, Murphy and Fisher (1988); Cooke-Davies (2002); Pinto & Slevin (1988a and b); Schultz, Slevin & Pinto (1987) and Slevin & Pinto (1986). This stream produces prescriptive lists of critical success factors, failure factors or risk factors that should be amplified to ensure a positive project outcome. Although this stream identifies important preconditions and drivers of project success, it does not provide explicit definition of project success itself, although the factors may indirectly point to relevant criteria.

The second stream focuses on identifying contingency variables that might impact project outcomes or require specific management intervention to mitigate any potential negative effects. These variables include project size (Yourdan, 1997), project type (Pinto and Covin, 1989 and Shenhar et al, 2002); life cycle stage (Pinto and Mantel, 1990), project management complexity (Shenhar and Wideman, 1996) and strategic versus operational mindsets (Schultz, Slevin and Pinto, 1987; Shenhar, Poli and Lechler, 2000). This stream identifies additional project variables that may have a critical impact on project success, depending on the project context and how the variables are managed. However, this stream still does not explicitly define measures of project success.

The third and last stream has its main interest in defining the criteria or measures by which a project is judged to be a success or failure. Some researchers suggest that success criteria should be on project-specific due to a broad range of contingency variables and therefore determined by stakeholders at the start of each project such as by Baccarini (1999), Nelson (2005), Turner (2004) and Wateridge (1998). Several reviews on project success researches exist in the literature such as by Jugdev & Müller (2005), Cooke-Davies (2004); Shenhar, Dvir and Levy (1997); Wateridge (1998). Furthermore,

Baccarini (1999) summarizes characteristics of project success criteria. Thus far, research and practice have tended to focus on "how to do it right" (the first two streams) at the expense of reaching consensus on what "right" is (the third steam). Certainly, there is a role for a common reference framework to enable project success to be discussed in a uniform way and to provide a standard benchmark by which project outcomes can be compared (Pinto & Slevin, 1988a). Despite all these studies, the project success rates remain dismal and not up to expectations. This can be due to several structural reasons as highlighted below.

2.1.1 No agreement on a standardized and holistic project success framework

Despite the voluminous literature, there has been no agreement among project personnel and researchers on a standardized definition of project success and in turn on a holistic project success framework among them as pointed by various researches in Table 2.1 below.

Table 2.1 List of various views on project success

Reference	Various views on project success
de Wit (1988)	…. measuring success is complex and stress to distinguish between project success and success of project management effort.
Shenhar et al (2001)	While this concept seems simple and intuitive, there is very little agreement in previous studies as to what really constitutes project success.
Bannerman (2008)	There has been much discussion on the nature and definition of project success, but no consensus has emerged.
Sebestyen (2017)	… the possibility of a consensus is a continuous quest.
Elbaz & Spang (2018)	… the definition of project success varies from stakeholder to stakeholder.
Welde (2018)	Project success is a heterogeneous measure. Different stakeholders may have different definitions of successful.

Rezvani & Khosravi (2018)	Defining project success is a challenging issue as it can mean different to different project stakeholders and individuals.
Castro et al (2019)	Given the diversity of success criteria measures….
Pirotti et al (2019)	… it is challenging to provide a definite and a consensus definition [of success] from all individuals concerned.
Elbaz & Spang (2020)	Different models have been developed to assess the project success….
Olawale et al (2020)	… it is widely held that project success means different things to different people and as such, it is mind dependent.

2.1.2 Not much empirical evidence for project success framework

The second problem statement which is related to the first one emphasizes that there is not much solid empirical evidence for the most advanced form of a multilevel project success framework such as that by Bannerman (2008). After scanning through the literature, it can be noted that some researchers have developed several useful project success frameworks. There distinction contended by de Wit (1988) appears to be the starting point to mark the paradigm shift from meeting the basic iron triangle which represents the project management success to the next level called the project success which focus on the output or deliverable success. Subsequently, Shenhar, Dvir & Levy (1997) revealed a multidimensional project success which comprises four success levels and criteria along with the respective metrics or indicators for tracking KPI (key performance indicators). Their four success levels are project efficiency, impact on customer, business success and preparing for future.

Shortly after, Baccarini (1999) developed a logical framework method (LFM) which distinguishes project management success (project efficiency) from product success (project effectiveness) based on the framework developed by the American Aid Agency for development projects in 1970s. LFM uses a hierarchy of objectives which has a four

level structure called as goal, purpose, output and input with going forward as the "how" while going backward as the why. Baccarini also effectively matched his four levels of LFM to the four dimensions of project success by Shenhar et al (1997) as shown in Table 2.2 below and calls the entire success continuum as project success which in turn consists of project management success and product success. Howsawi & Eager (2014) replaced the preparing for the future with a dimension called context or externality success to cater for overcoming challenges posed by external environment to the organizations, so still keeping the success levels at four but cascaded from top to bottom as context, business, product and project. They then tested their framework using three case studies. Later, Shenhar et al (2007) added team satisfaction as an additional dimension, increasing the number of success levels and criteria to five.

Bannerman (2008) appears to capitalize on the above evolution to develop his multilevel project success framework with five levels and criteria which is augmented by two more continuums called stakeholders as the middle tier and derived value as the top tier as shown in Figure 2.1. He emphasized that his proposed framework is conceptual and backed up by six 6 case examples, therefore the need for more research to test its relevance, completeness of its criteria and practical utility through application in practice and research. The five success dimensions by Shenhar et al (2007) can be matched to that of Bannerman (2008) as shown in Table 2.2. Bannerman (2012) used a slightly modified phrase to call his framework i.e. multidomain framework for defining IT project success.

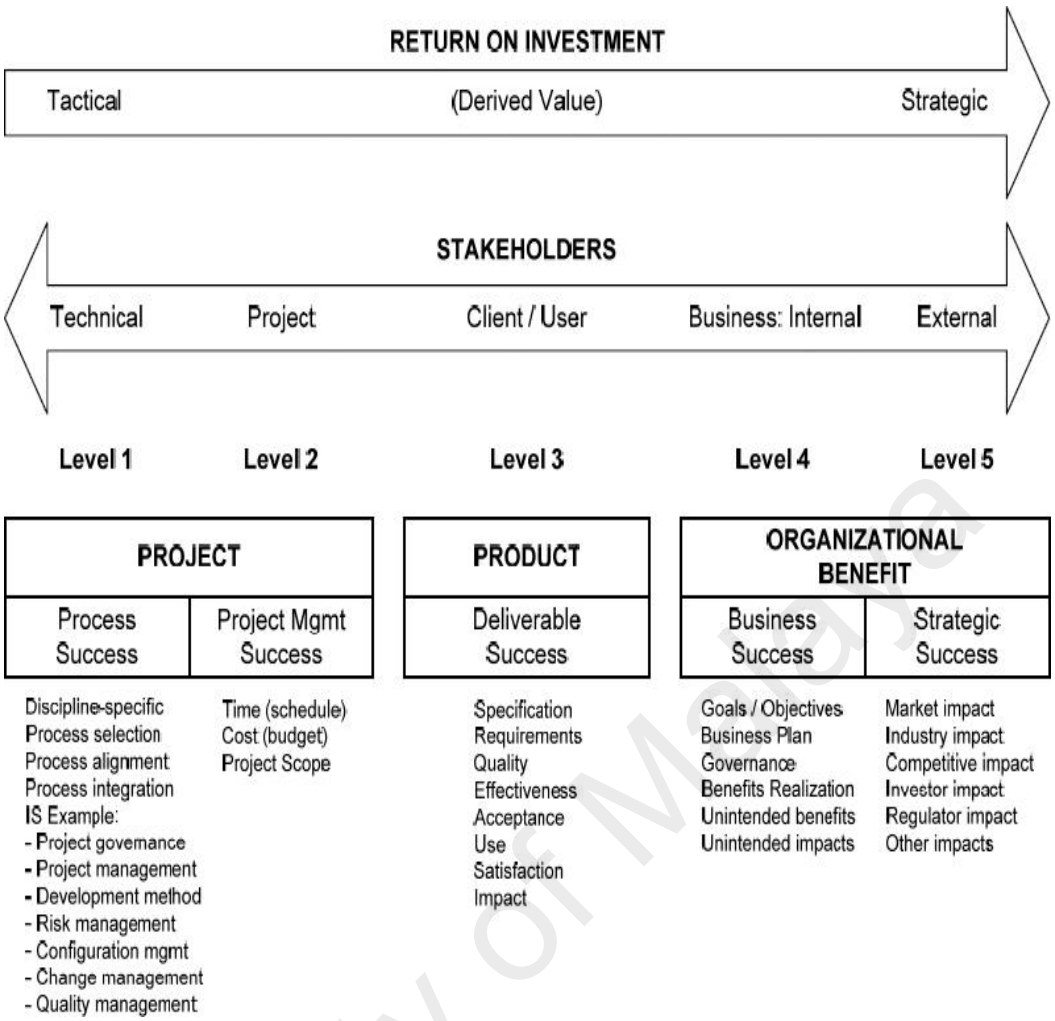


Figure 2.1 Multilevel project success framework by Bannerman (2008)

Interestingly, UNDP (2012) outlines its results framework for evaluating success of international development aid projects. The results framework has five levels i.e. input, process, output, outcome and impact. UK DFID (2013) uses the same results framework and highlights the importance of using not only the indicators of the five levels of success of the theory of change but also the derived indicators for assessing the value for money (VfM) namely economy, efficiency, effectiveness and cost-effectiveness (3E1C) as in Figure 2.2. Therefore, the input level is added into the conceptual multilevel project success framework that is enhanced from that of Bannerman (2008) to enable generation of the derived indicators for evaluating the value for money (VfM). This addition also

makes the framework more holistic because it shall cover the full life cycle of the asset, product, service or result as the output delivered by projects as explained in the next section. Baccarini (199) mentioned the stakeholder satisfaction to include contractor and customer, so these two stakeholders are added into the stakeholder continuum in the Bannerman (2008)'s original framework.

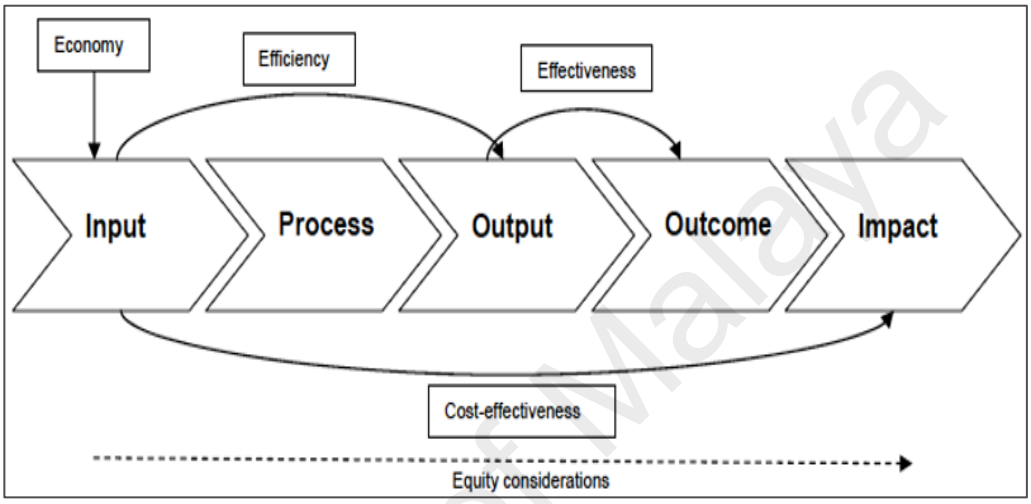
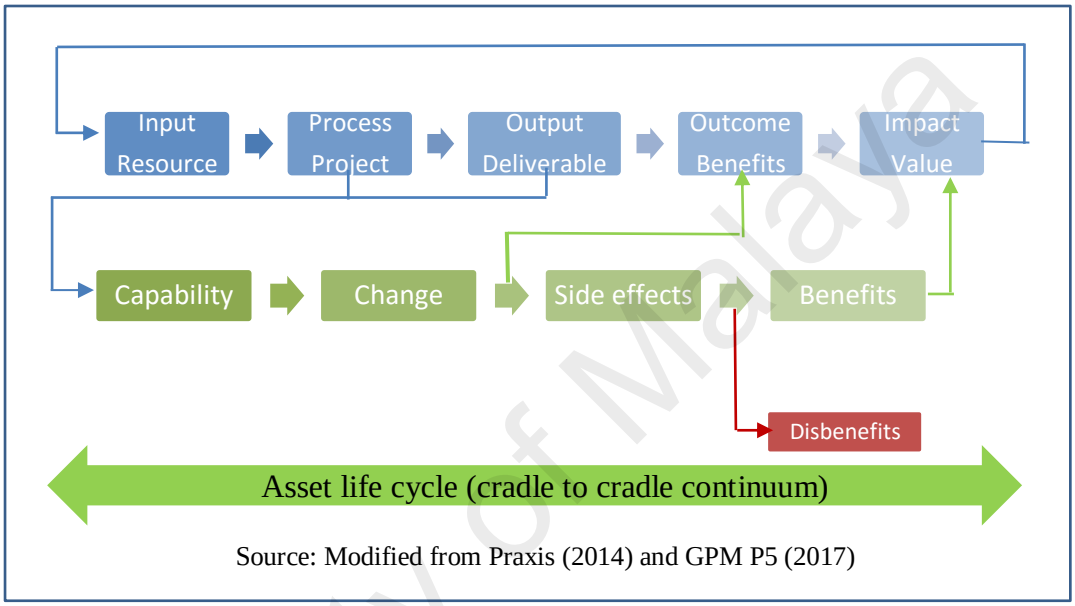


Figure 2.2 The results framework by UNDP (2012) with VfM indicators

The matching of similar project success frameworks or criteria with that of Bannerman (2008) based on the theory of change is depicted in Table 2.2 below to put them into the right perspectives. The other similar frameworks which have not mentioned earlier include those by Sutton (2005), Morris & Hough (1987), Lim & Mohamed (1999) which was developed based on Hayfield (1979) and Serra & Kunc (2015). These frameworks fit well with that Bannerman (2008) as can be seen from Table 2.2. It should be noted the framework by Serra & Kunc (2015) is developed for benefits management which covers the outcome and impact levels in the Bannerman (2008)'s framework; however, they added more levels to cater for the need for making the pre-requisite organizational change management to enable the transition from the output to outcome levels. It is possible to add on the subset flow for organizational change management, when this is required, into

the main flow of the theory of change framework as illustrated in Figure 2.3 below although this study focuses on the latter only. This figure shows the importance of the conceptual framework which is enhanced from the Bannerman (2008) framework because they both share a similarity in the form of the main flow.

Figure 2.3 Theory of change framework main flow with a subset flow



Source: Modified from Praxis (2014) and GPM P5 (2017)

Table 2.2 Matching of similar project success frameworks based on theory of change

Source/Level	Name & components	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Bannerman (2008)	**Multilevel success**	**[Input]**	**Process success**	**PM success**	**Deliverable success**	**Business success**	**Strategic success**
	Domain		Project		Product	Organizational benefits	
	Stakeholder	Owner/ Sponsor	Team [Contractor/Consultant]	Project management	Client/User / [Customer]	Business internal	External
	Value		**[Operational]**		**Tactical**	**Strategic**	
UNDP (2012), DFID (2013)	Results framework	Input	Process	Output	Outcome	Impact	[Effect]
De Wit (1988)	Dichotomy	[Input]	Project management (PM) success		Project success based on cascaded objectives		
	Hierarchy / Goal		Departmental management			Venture management	BOD
			Exploration/Technical/Project		Operations		
	Objective		Exploration	Development	Production	Profitability	Survival
	Management level		Technical Level III			Management Level II	Institutional Level I
	Time dimension		Short run		Intermediate run	Long run	
Shenhar et al (1997, 2001, 2007)	Five dimensions of success	[Input]	Team satisfaction	Project efficiency	Impact on customer	Business success	Preparing for future
	Time horizon		Short term	Medium term	Long term	Very long term	Future
Baccarini (1999)	LFM	Input	[Process]	Output	Purpose	Goal	
		Project success					
		Project management success			Product success		
	Time dimension	Short term			Long term		
	View	Project efficiency/Internal			Project effectiveness/External		
	Stakeholder	Stakeholder satisfaction (Perceived success, hard vs soft measures)					
Sutton (2005)	Project success model		Basic PM success	Repeatable PM success	Project success	Corporate success	[Impact]
	Strategic alignment		Work management	Project management	Program management	Portfolio management	Strategic management
Morris & Hough (1987), Asley (1986)	Project success criteria	[Input]	Contractor's commercial performance	Project management	Project functionality	Nil	Nil

Lim & Mohamed (1999), Hayfield (1979)	Macro view vs micro view		Micro viewpoint: Narrow satisfaction (Time, cost, quality, performance & safety)			Macro viewpoint: Broad satisfaction (Utility & operation) and Completion (Time)				
Serra & Kunc (2015)	Benefits management	[Input]	[Project]	Project Output	Change mgt	Desired Outcome	Intermediate benefits	End benefits	Strategic objectives	
PMI PMBOK (2017)		[Input]	Process based, ITTO	Project mgt	Change mgt	Program management Multiple project management Change management		Portfolio management Benefits management	Strategic management	
APM BoK (2019)	Project-based working	[Input]	Topic based	Project mgt	Change mgt	Program management Multiple project management Change management		Portfolio management Benefits management	Strategic management	
GPM P5 (2017)	Asset life cycle	Life cycle cost-benefit management (cradle to cradle)								
Praxis (2014)	P3 management	[Input]	Management of project, program, portfolio and change						Strategic management	
Elbaz & Spang (2018)	Six-dimensional project success	[Input]	Management success			Functional success		Business and Organization success	Strategy, investment & ownership success	
			Process success	PM success						
Zidane, Johansen & Ekambaram (2015)	Project evaluation holistic framework	Need / Objectives / Input	Throughput	Output		Outcome		Impact	Purpose	
	Value		Operational			Tactical		Strategic		
	VfM	Relevance	Efficiency							
			Effectiveness							
		Sustainability [cradle to cradle life cycle]								
Netlipse (2016)	IPAT model	[Input]	Project delivery			Benefits realization				
	Stakeholder		Project delivery organization (PDO)			Client/Sponsor (C/S)				
	Internal context		Prime responsibility by PDO			Prime responsibility by C/S				
			Shared responsibility by PDO & C/S							
	External dynamics		Shared responsibility by PDO & C/S							

Pinto & Slevin (1988b)	Project success model		Project success	Client success	
			Time, cost & performance	Use, satisfaction and effectiveness	
IPMA (2018)	PEB	[Input]	Project results		
	Stakeholders		Stakeholders' satisfaction		
Hartman & Ashrafi (2004)	SMART framework	Balance of PM issues	Technical	Business	Social

Note: […] denotes elements added by the author

Recently, the results framework (called logframe) has been used by Welde (2018) for evaluating the success of a motorway project in Norway and Volden (2018) for evaluating 20 infrastructure projects also in Norway. These two studies appear to be the limited examples of application of the multilevel success framework outside of development projects as of now. Volde clearly divides the value continuum into operational, tactical and strategic levels within a chart with time vs uncertainty axes, so the operational level is added into the derived value continuum in the original framework of Bannerman (2008). Elbaz & Spang (2018) use a six-dimensional project success for evaluation of infrastructure projects in Germany and their model is actually a refinement of five dimensions of project success by Shenhar et al (2007) and thus Bannerman (2008) as well. However, Nanthagopan, Williams & Thomson (2018) in their evaluation of development projects in Sri Lanka appears to truncate the results framework into three levels i.e. project management success for process level, project success for output level and NGO organization success whose evaluation criteria appear to cover both outcome and impact levels viz. "Achieving vision, mission and objectives. Stakeholders' reputation and rapport. Sustainability."

In brief, the multilevel project success framework has not been widely used by industries or sectors since its inception, resulting in lack of solid empirical evidence to be holistic and fit for use. Most researches just briefly define what project success means when it is treated as the dependent variable with varying completeness of success criteria used from moderately complete to none at all during the studies on the influence of related components of project success such as the critical success factors and contingency factors on project success as shown in Table 2.3 below.

2.1.3 Bifurcated project success management continuum

The third problem statement highlights the bifurcation or separation of project management (process) and project (deliverable) successes from their subsequent counterparts which are the business (outcome) and strategic (impact) successes under the umbrella of organization benefits. This separation glaringly exists in the PMI PMBOK Guide (2017) and APM BoK Guide (2019) that segregate the standard for project management from the standards for program and portfolio managements (as shown in Table 2.2), perhaps to ease the development of the respective guides as separate standards This leaves the option or necessary actions to consolidate and map the management of projects, programs and portfolios to each organization. This separation may seem advantageous at first but new project management bodies such as GPM P5 (2017) and Praxis (2014) combine and present the three domains of projects, programs and portfolios as one package or standard as shown in Table 2.2 earlier.

GPM P5 not only consolidates or integrates the three domains but goes further by advocating an overall asset life cycle cost-benefit perspective based on a cradle to cradle life span as in Figure 2.4 below in its Global P5 standard for Sustainability in Project Management in line with ISO55000 (2014). Praxis, published by APM UK declares that it is a free framework for the management of projects, programs and portfolios. It brings together under its umbrella a body of knowledge, methodology, competence framework and capability maturity model in a single integrated framework with a single structure and terminology. Thus, this eliminates the need for mapping and translation between different guides. PMI PMBOK Guide (2017) only refers to project life cycle but not the product life cycle which clearly bifurcates the project from the product, service or result that can lead to heavy focus on achieving success over the short-term instead of over the long term. This can mean a project success can result in a product failure. Another life cycle perspective is demonstrated by a typical product life cycle with five stages that is

illustrated in Figure 2.5 below where project management is required during the first phase called product development.

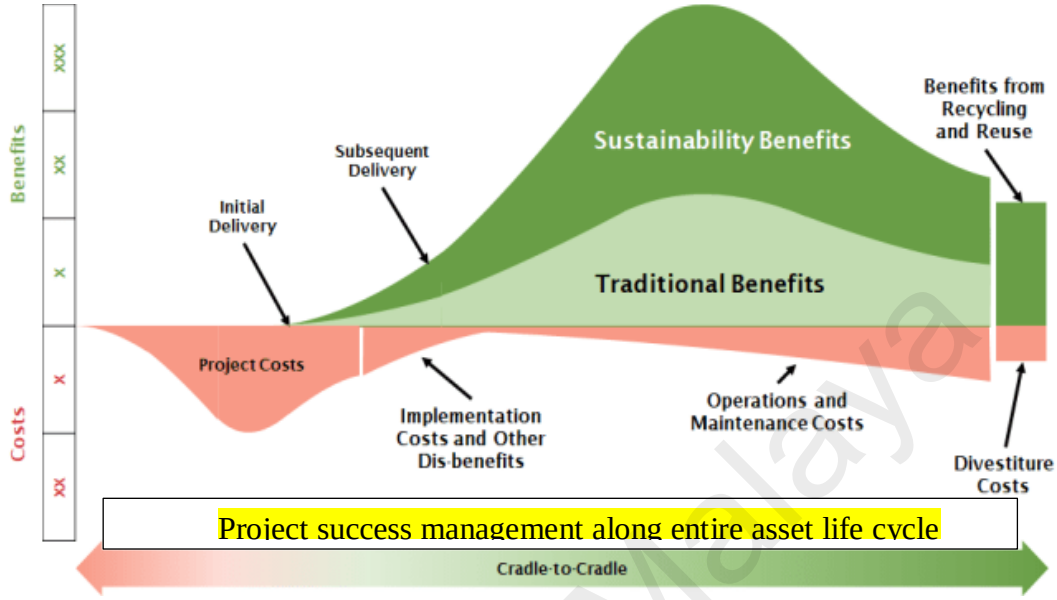


Figure 2.4 Overall cradle to cradle asset life-cycle perspective (GPM P5, 2017)

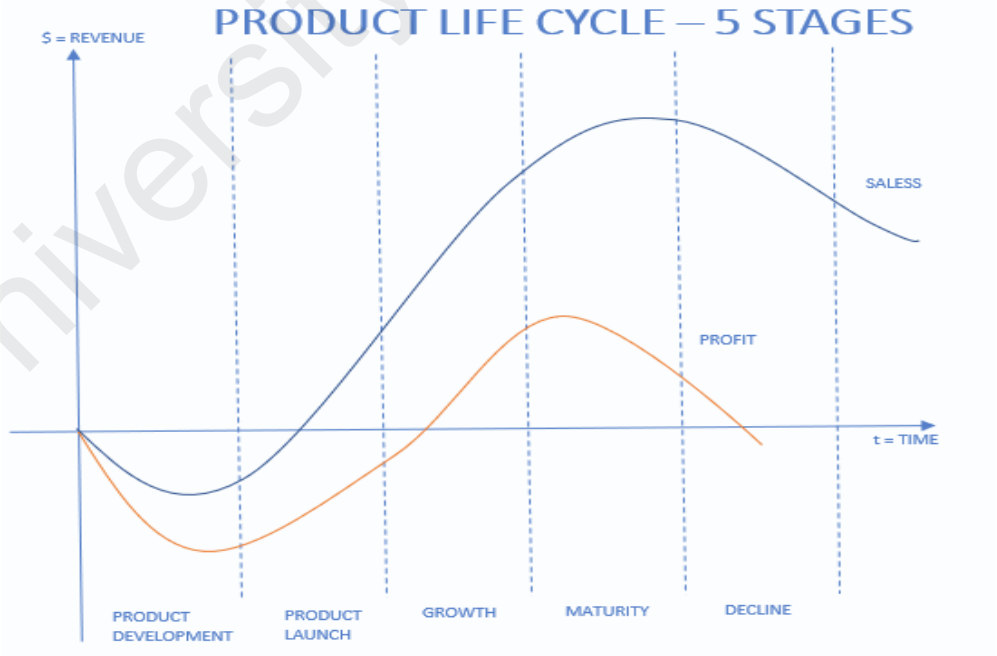


Figure 2.5 Product / service life cycle (cradle to cradle perspective)

Source: Seekerexecutive.com (2018)

The possible disadvantage of the said glaring bifurcation is that it might fail to instigate project personnel and their organizations to realize the need for integrating the management of projects, programs and portfolios as one domain (GPM P5, 2017; Praxis, 2014) in order to enable their fair-share contribution to the economic value added and strategic alignment with the overarching organizational strategy as contended by Graham & Cohen (2001) and Morris (2004) respectively. In fact, Graham & Cohen (2001) contended for the need to move beyond the triple constraints by approaching project management as a business venture management to enable project contribution to the economic value added and the organizational strategy as illustrated in Figure 2.6. Morris (2004) argued for the need and importance of strategic alignment from the top level of the organizational strategy through the portfolio, program and project strategies down to team and individual levels as shown in Figure 2.7.

Meredith & Zwikael (2020) testifies to the existence of the problem of lacking the drive or unable to reap benefits post-project completion when they stated "Given that no one is specifically accountable for delivering these benefits, it should be no surprise that these projects are largely unsuccessful.', thus requiring the creation of a position they call 'the project owner'. Varajão & Trigo (2016) propose the inclusion of success management as another knowledge area in project management as they contend that project success contributes to improvement of project success rates and organizational success. This is followed by Takagi, Varajão & Nascimento (2019), Takagi, Varajão & Ribeiro (2019) and Takagi & Varajao (2019). However, their definition of success appears to be restricted to only project success instead of explicitly covering success of all three domains of project, program and portfolio management to complement the organizational strategic management and other functional areas within the organization particularly operations management as part of the overarching value chain framework of Porter (1985).

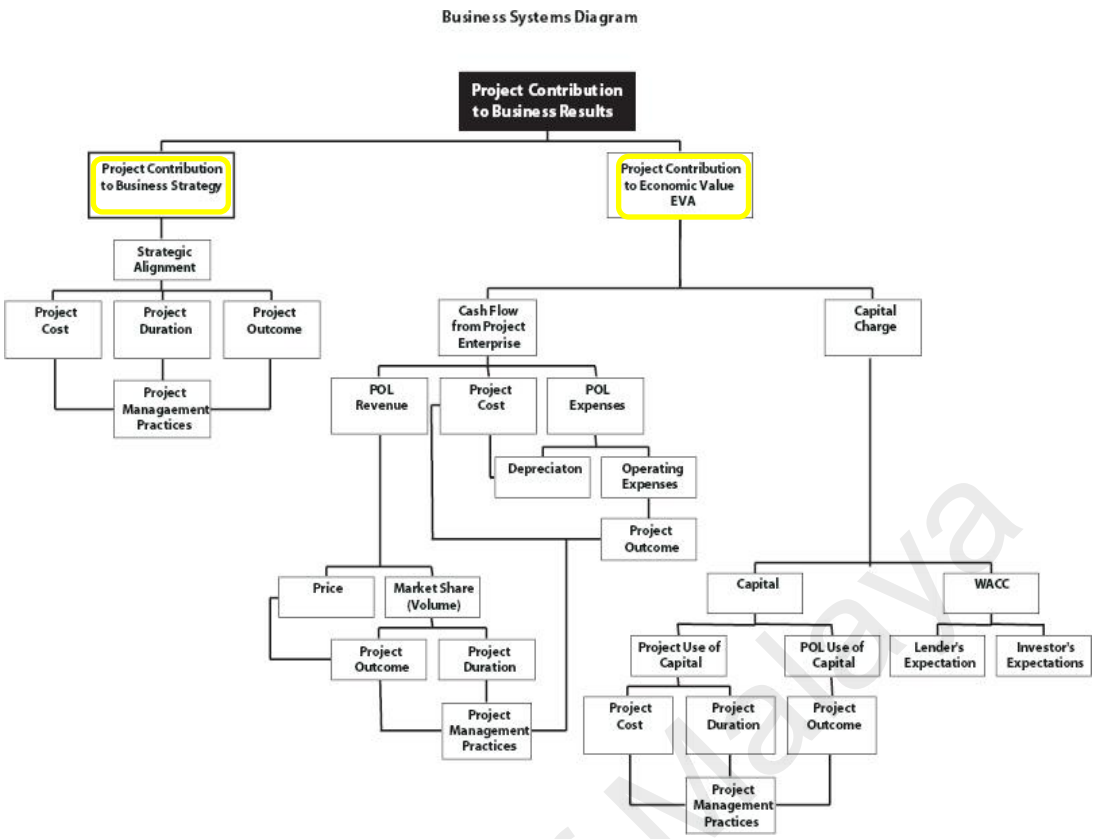


Figure 2.6 Project contribution to organizational performance results

Source: Graham & Cohen (2001)

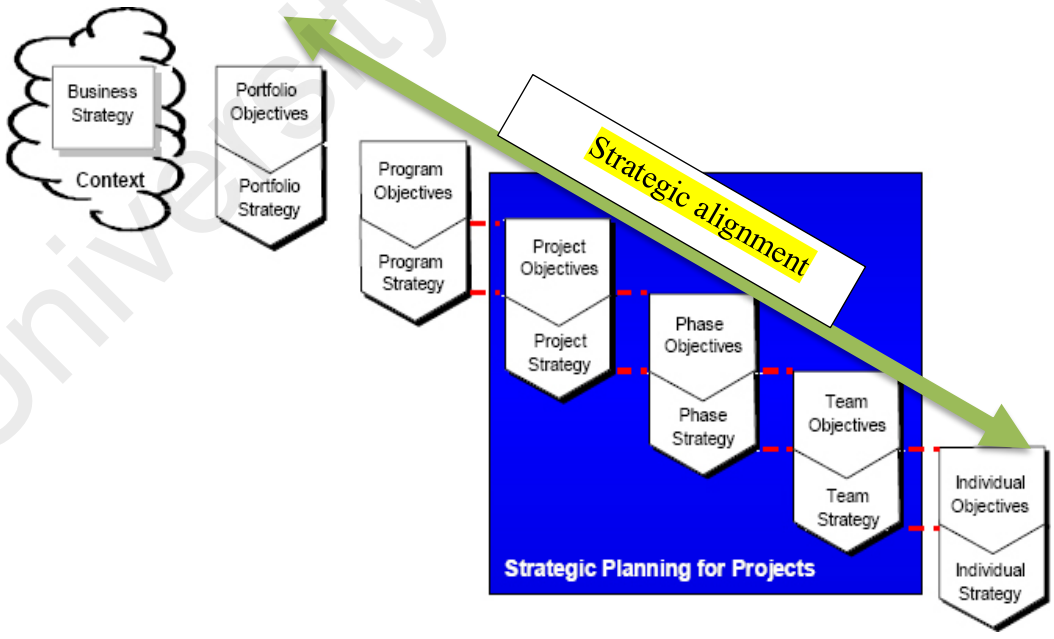


Figure 2.7 Strategic alignment along the organizational hierarchy

Source: Enhanced from Morris (2004)

2.2 Review of project success frameworks and criteria

There is a number of project success frameworks being reviewed to assess their respective strengths and weaknesses in order to develop a conceptual framework for this research. Earlier, the matching of some notable project success frameworks was presented in Table 2.2. Next, the list of references studied and the findings of the review on the strengths and weaknesses of the respective project success frameworks and/or criteria are tabulated in Table 2.3 below. The review focus on relevant seminar works on project success frameworks and is eventually restricted to mostly on a period between 2016 to 2020 for the currency of the research problem statement and due to the voluminous research on project success. Out of the list, several other project success frameworks which appear to be in a different format at the first glance were also reviewed such as the six-dimensional project success by Elbaz & Spang (2018) in Figure 2.8, project evaluation holistic framework by Zidane, Johansen & Ekambaram (2015) in Figure 2.9 and the IPAT model by Netlipse (2016) in Figure 2.10. As has been shown in Table 2.2, all three frameworks can be matched into the multilevel project success framework. The IPAT model does not define success criteria (results), thus effectively making it a CSF framework which is excluded in this research which focuses on the use of project success frameworks with their criteria (results) and indicators.

In short, many of the success frameworks can be arranged into multilevel based on their success criteria to match the form and function of the Bannerman (2008)'s framework and according to the result frameworks developed based on the theory of change by UNDP (2012) and DFID (2013). Some of the researches use project success as the dependent variable in their studies either by defining the criteria adequately such by Welde (2018), Volden (2018) and Zidane, Johansen & Ekambaram (2015) or inadequately such as by Salman et al, 2020; Hassani-Alaoui, Cameron & Geannelia, 2020), using the customized versions such as by Hadjinicolaou, Dumrak & Mostafa,

2020; Nathagopan, Williams & Thompson, 2019), mixed up versions of both success criteria and factors such as by Mkoba & Marnewick, 2020; Miller, 2019) or not defining the success criteria at all such as by Elbaz & Spang, 2020; Pirotti et al, 2019).

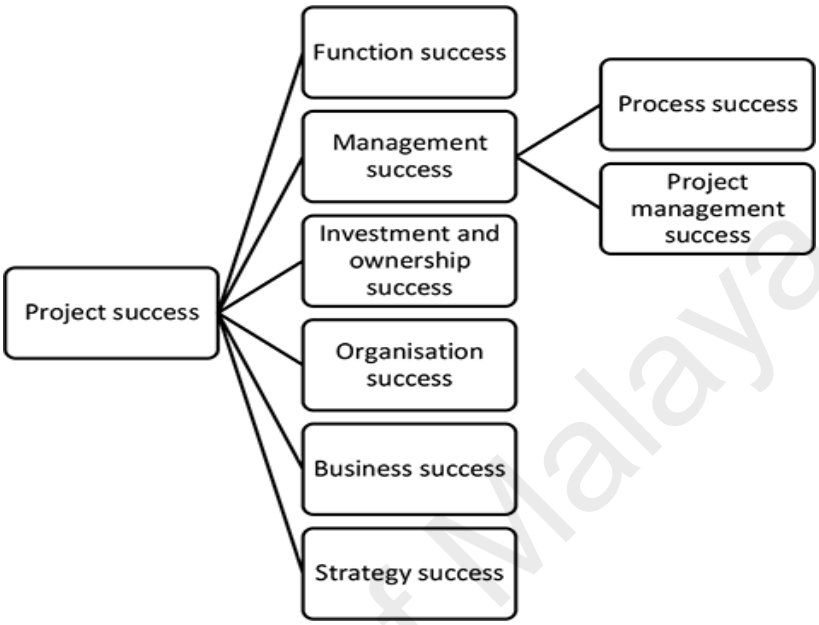


Figure 2.8 Six-dimensional project success by Elbaz & Spang (2018)

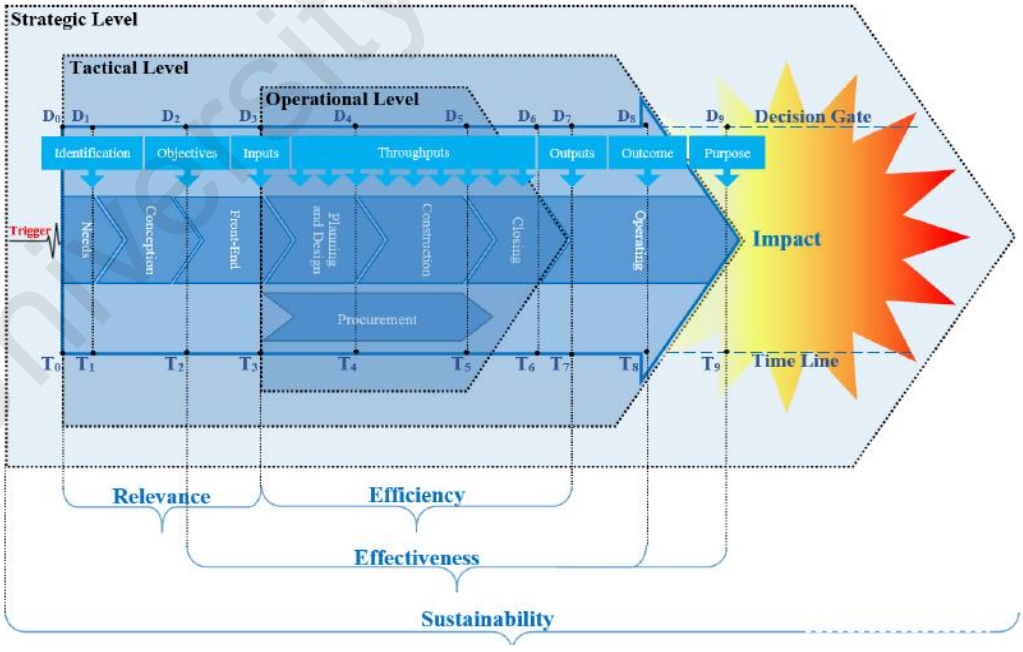


Figure 2.9 Project evaluation holistic framework by Zidane, Johansen & Ekambaram (2015)

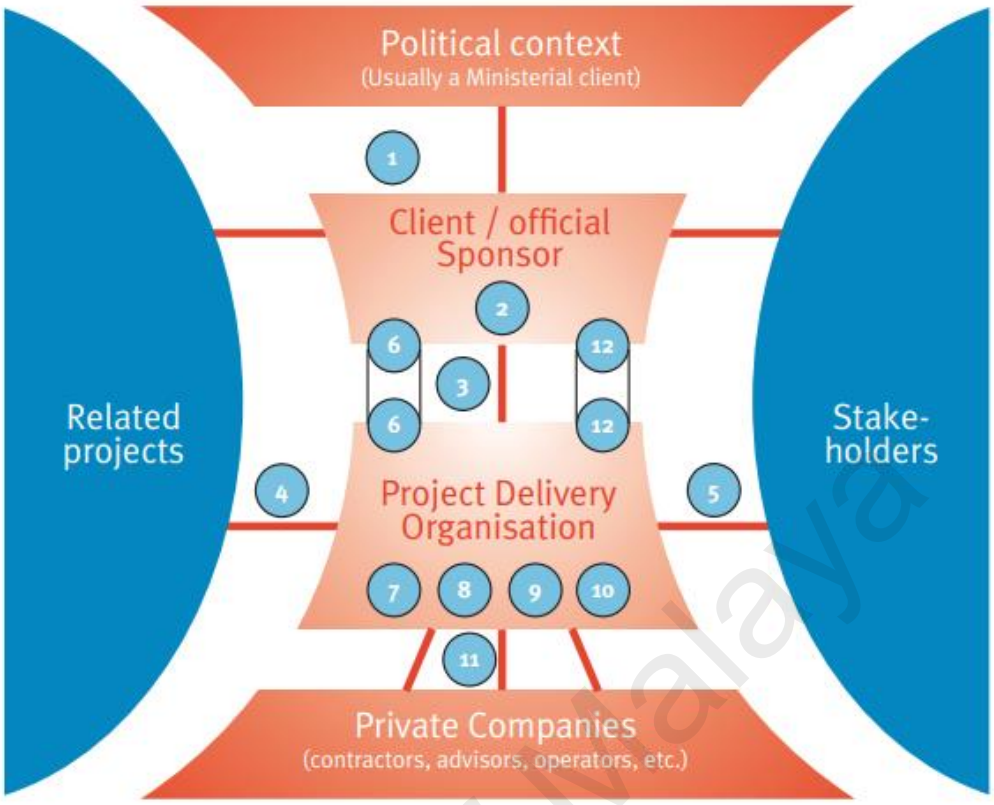


Figure 2.10 Infrastructure project assessment tool (IPAT) model by Netlipse (2016)

Table 2.3 Review of project success frameworks and criteria

Reference	Strength	Weakness
Shenhar et al (2001)	Use 4 levels of success criteria with metrics with time dimension: project efficiency, impact on customer, business success and success for future. Their relative importance increases with technical uncertainty and time.	No process success level.
Chan and Chan (2002)	Use sets of objective and subjective measures as KPI at pre-completion, construction and post-construction phases.	The phases be arranged into multilevel success continuum but lack focus on strategic/industry level.
Sutton (2005)	Use 4 success levels: basic PM, repeatable PM, project success and corporate success	No strategic success level for external stakeholders or context
Gross and Wehnes (2005)	Use objectives fulfilled and satisfaction of stakeholders	Points based system, not multilevel
Bannerman (2008)	**Use 5 levels of criteria (process, project management, deliverable, business & strategic) and 3 continuums of success, stakeholders and value.**	**No input level to calculate economy, efficiency and cost-effectiveness**
UNDP (2012)	Use goal-oriented framework of 5 levels of success: Input-Project-Output-Outcome-Impact. Enable deriving indicators for VfM called economy, efficiency, effectiveness and cost-effectiveness.	But stakeholders and value not depicted
Serra & Kunc (2015)	Focus on intermediate and end benefits only. Need for business change between output and outcome	Can be arranged into multilevel
Zidane, Johansen & Ekambaram (2015)	**Use five dimensions of success i.e. operational, tactical, strategic, relevance, effectiveness and impact within a value chain framework.**	**Multilevel based on OECD (2000) and Samset (2003). In line with Bannerman (2008) and UNDP (2012).**
Netlipse (2016)	Use a nexus of context, organization and results (success criteria) and Infrastructure Project Assessment Tool (IPAT) model uses twelve project management themes which can be evaluated at three stages ie ex	Not arranged in multilevel. Effectively, IPAT model is a project strategy framework, not exactly a results (success criteria) framework.

	ante appraisal, monitoring and post ante evaluation for improvement and benchmarking purposes throughout project start to finish.	
Silva, Warnakulasooriya & Arachchige (2016)	Divide project success criteria into efficiency (short term) and effectiveness (long term) measures: cost, time, quality, safety & cash flow vs environment, client, employee, profitability & learning cum development.	Not arranged into multilevel
Revani et al (2016)	Project success is defined by communication, troubleshooting, mission clarity and top management support.	The success criteria used are success factors.
Varajao & Trigo (2016)	IS project success criteria are: Compliance with time, budget and scope, business goals and client's business objectives; Satisfaction of user, customer, operational team and sponsor; Quality of resulting products/services (deliverables); Use of IS solutions by the customer; Contribution to the organization development; Intangible benefits like image; Satisfaction of participating vendors, personal development of team members, public recognition or the social, economic and environmental impacts and value created.	Not arranged into multilevel
Joslin & Muller (2016a)	Project success criteria used are: Project efficiency Organizational benefits Project impact Future potential Stakeholder satisfaction.	Follow Shenhar et al (2001)
Nguyen, Nguyen & Chao (2016)	Criteria of IS project success: project success, IS success and acceptance and use of technology.	Incomplete levels of success
Badewi & Shehab (2016)	Criteria of ERP project success comprise project success, project management success and investment success under business change management.	Only three levels of success.
Joslin & Muller (2016b)	Projects were mostly evaluated based on time, cost, scope, and	Not multilevel

	sometimes customer satisfaction. For the research organizations, success was measured by number of ideas proposed, developed and industrialized.	
Akal, Abu El-Maaty & Hamrawy (2016)	Criteria of highway project success in Egypt are project completed on time and within budget, health, safety and number of accidents, profitability and quality in construction have been ranked as the most important measures.	Can be arranged into multilevel of success criteria.
Badewi (2016)	Criteria of organizational governance project success are project management success, benefits management success and project investment success.	Not many organizations managing both project and benefits at the same time.
Wahaj et al (2017)	Three criteria of construction project success in India: Client success, consultant success and contractor success	Other stakeholders not included.
Sebestyen (2017)	Use six aspects of success: traditional (iron triangle), advanced considerations, extension (value creation), human, finance and stakeholder perceptions.	The aspects can be arranged into multilevel.
Lee & Kruger (2017)	ICT project success criteria are project management, project and value created more than cost incurred.	Can be arranged into multilevel
Shenhar & Holzmann (2017)	Success criteria of megaprojects are efficiency, customer/user impact, financial/business and impact on society	Process success excluded
Albert, Balve & Spang (2017)	Use hard and soft criteria to define project success. Hard criteria are cost, time and performance, economic/business and quality (technical vs financial). Soft criteria include satisfaction of company, line-manager, project-member, customer, end-user and supplier.	Hard and soft criteria can be arranged along separate continuums which are multilevel.
Davis (2017)	Multiple stakeholder groups' perception of project success dimensions are iron triangle, accountability & involvement and benefits to stakeholders	For stakeholders' continuum only.

ul Musawir et al (2017)	Criteria of organizational strategy implementation project success are project management success, project ownership success and project investment success	Limited levels of success
Silva, Warnakulasuriya & Arachchige (2017)	Perceived construction project success criteria are project implementation efficiency, project compliance management efficiency and preparing for future.	Lack of business and strategic successes. No value creation included. Focus on operational and tactical successes.
Ullah et al (2017)	Success criteria of construction industry in Pakistan are cost, human resource, quality, safety, scope, stakeholder and time.	It can be arranged into multilevel but excludes strategic level or value creation.
Sharma & Chanda (2017)	Criteria of R&D project success are cost (budget overrun), quality and schedule (delay).	Only project management success.
Haried & Claybaugh (2017)	Criteria of IS offshore project success are outcome success (financial impact) and relational success (trust, commitment, benefits & risk-sharing and conflict)	Only two levels of success i.e. outcome and stakeholders' satisfaction.
Sumner (2018)	Success criteria of ERP projects are: Project cost and duration Business and system benefits	Incomplete criteria
Volden (2018)	**Use a multilevel logic model of Input-Process-Output-Outcome-Societal objective Three criteria of public project success: Operational (efficiency), Tactical (effectiveness) and Strategic (other impacts, relevance, sustainability and benefit-cost efficiency).**	**Societal objective should be expanded to include all impacts.**
Rezvani & Khosravi (2018)	Use project management criteria such as time/schedule, cost/budget and quality; stakeholders' satisfaction, meeting user/customer/owner's requirements, standardized project delivery, efficiency and availability of resources.	Can be arranged into multilevel. No strategic level or value creation included.
Elbaz & Spang (2018)	Use eight dimensions of success: function, process, project management, investment and ownership, organization, business and strategy.	Multilevel but perhaps over subdivided.

Welde (2018)	**Use three levels of success criteria based on a logical framework of inputs, activities and results: Operational (efficiency), Tactical (effectiveness), Strategic (impact, relevance & sustainability) and Value for money. Use a spider chart.**	**Multilevel as per theory of change UNDP (2012).**
Nguyen & Hadikusumo (2018)	Define project success using time, cost, quality management and benefits.	Not multilevel
Adzmi & Hassan (2018)	The success of the IT project is determined by its time completion, within cost and meet project performance based on initial plan.	Not multilevel
Pankratz & Basten (2018)	Use a black box of output variables (success criteria) and input variables (success factors). Eight success criteria used are adherence to budget & schedule, meeting functional & non-functional requirements, Process efficiency, customer and contractor satisfaction and System is used by end user.	Only 3 basic success levels i.e. input, process and output.
Mikkelsen (2018)	Criteria of project success are project efficiency based on triple constraints, and project effectiveness with product/client and organizational dimensions	Can be arranged into multilevel
Kristiansen & Ritala (2018)	Three sets of metrics for radical innovation are market orientation, learning and future opportunities and resource dedication.	Only three success levels and criteria.
Barros & Ribeiro (2018)	Use success breakdown structure whereby multi-stakeholder use success criteria at project, product, business, personal and satisfaction levels with respective indicators assessed at short, medium and long terms.	Can be matched with multilevel
Turner & Xue (2018)	Criteria for megaprojects are output, outcome and impact.	Multilevel but has 3 levels only
Redda & Turner (2018)	Identified 3 success criteria: project management, business and future potential/growth.	Only 3 success levels
Neumann, Robson & Sloan (2018)	Success criteria for organization change/IT programmes are	Can be matched into multilevel

	process complexity, efficiency, customer service and business performance, growth, profitability and competitiveness	
Biddulph et al (2018)	4 key PSC: time & cost performance, quality and customer satisfaction.	Incomplete PSC.
Slay et al (2018)	3 categories of success criteria of public sector projects /programs: Core outcomes, stakeholder satisfaction and compliance to project management processes	Can be arranged into multilevel
Castro et al (2019)	Use four criteria: project efficiency, organizational benefits, project impact, stakeholder satisfaction and future potential.	Based on Shenhar et al (2007)
Nathagopan, Williams & Thompson (2019)	Use three levels of success: project management, project and NGO	Outcome and Impact levels combined.
Liu et al (2019)	Two components of smart city project success: Data integration-oriented performance Citizen service-oriented performance	Two levels only
Osei-Kyei & Chan (2019)	The success index model developed consists of four unrelated success criteria groupings: cost effectiveness, quality of services and technical specification, environmental impact and long-term partnership.	Can be arranged into multilevel
Mubeen et al (2019)	Four criteria of software project success: Meet an agreed budget, deliver on time, add value and meet quality requirements	Can be arranged into multilevel
Odabashian, HassabElnaby & Manoukian (2019)	Success criteria of renewable energy projects: Time performance and Financial performance	Inadequate criteria
Bigbee & Stenvenson (2019)	IT project success criteria: adherence to schedules, vigilant cost accounting, and producing desired outcome	Inadequate criteria
Kissi et al (2019)	Success criteria of construction projects in Ghana are Performance of Cost, Schedule, Quality, Health and safety, Relationship with project	Not arranged into multilevel and no strategic level

	stakeholder, Scope definition and Environmental performance	
Akbiyikli et al (2019)	Criteria of PFI projects are: Risk evaluation, pricing, allocation and management, completion on time and budget, clear objectives set and life cycle cost.	Not arranged into multilevel, no benefits or value creation included.
Zaman et al (2019)	Criteria of Telecommunication Project Success: Meeting design goals, Impact on customers and Benefits to organization	Not arranged into multilevel. Based on Shenhar et al (1997)
Rojas et al (2019)	Criteria of medical project success are: Safe and effective product, Regulatory compliance, Patient safety, Consistent quality and Overall product success	Not arranged into multilevel. No value creation included.
Miller (2019)	Criteria of interdisciplinary decision support project success are: Achieving project mission and schedule/plan, Client consultation and acceptance, Personnel engagement, Delivering technical tasks Value-adding project management	Segmented but not organized into multilevel. Success criteria and factors are tabulated together.
Ahmadabadi & Heravi (2019)	Criteria of PPP project success are project efficiency, impact on customer, business success and preparing for future.	Follow Shenhar et al (2001)
Bryde, Unterhitzenberger & Joby (2019)	Criteria of client-contractor project success are project management success, deliverable and client satisfaction.	Incomplete levels of success. No value creation. Not arranged into multilevel.
Zwikael & Smyrk (2019)	Criteria of project success are project management success, project ownership success and project investment success.	Can be arranged into multilevel.
Yamin, Abdul-Rahman & Alashwal (2019)	Criteria of development project success in Maldives are satisfaction of stakeholders who are the donor, project team and beneficiaries.	Focus on stakeholders' satisfaction. Not multilevel.
Pirotti et al (2019)	Project success criteria encapsulate human, budgetary and technical variables.	Success criteria are not explicitly mentioned or defined.
Oh, Lee & Zo (2019)	Criteria of ISD project success are requirements fulfilment, schedule compliance, cost compliance, customer satisfaction, contribution of shared culture and value, output	Can be arranged into arranged into multilevel

	quality, solution of project problem.	
Farokhad et al (2019)	Success criteria of R&D and Innovation projects are project management criteria, future potential, partner's satisfaction and project goals & mission (knowledge generation)	Can be arranged into multilevel
Haass & Guzman (2019)	Criteria of project success are efficiency & effectiveness, business success, impact & sustainability.	Can be arranged into multilevel.
Derakhshan, Turner & Mancini (2019)	Criteria of project success are success at organization, project and value levels, knowledge, stakeholders (internal & external) and trust & ethics.	Can be arranged into multilevel
Beng, Kamran & Hamzah (2019)	Success criteria are business/shareholder value and reputation.	Only 2 success levels, inadequate.
Chan & Adabre (2019)	Six components of success for housing projects: household satisfaction, stakeholders' satisfaction, house operation cost, time measurement, location affordability cost and quality.	Incomplete success criteria
Yan et al (2019)	Revealed 4 underlying dimensions for construction programs' success: organizational strategic goals, construction program performance, social harmony an stakeholders' satisfaction.	Can be arranged into multilevel.
Adabre & Chan (2019)	Success criteria of housing projects are product, project management and project successes.	No impact level
Cooper (2019)	Success drivers of NPD projects are product characteristics, business (organizational & strategic) and systems & methods.	Can be arranged into multilevel
Viswanathan, Tripathi & Jha (2020)	Criteria of international construction project success are cost performance, schedule performance and firm's performance.	Inadequate levels of success
Hadjinicolaou, Dumrak & Mostafa (2020)	Studied seven dimensions of project success: Completion on time, Completion on budget, Delivery of agreed	Multilevel, following Shenhar et al (2001)

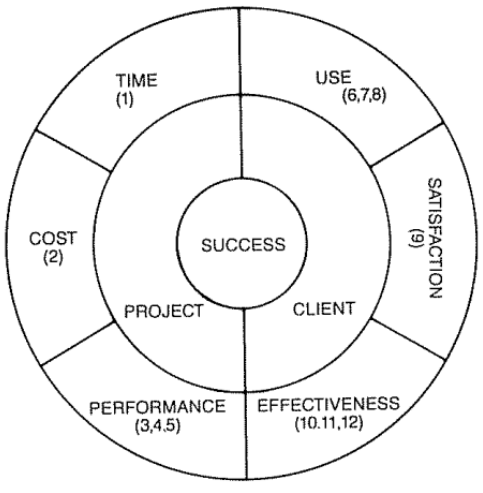
	specifications, Team satisfaction, Stakeholder satisfaction, Delivery of business success and Preparation for future business growth.	
Hassani-Alaoui, Cameron & Geannelia (2020)	Success criteria for agile software development: increase client and customer satisfaction with the product as core business, focus on quality of product instead of budget & schedule which are managed at enterprise level.	Can be arranged into arranged into multilevel. Basic tactical success criteria. Lacking strategic level.
Salman et al (2020)	Criteria of software development project success are completed on time and within the budget allocated by the customer and customer satisfaction level in accordance with his requirements with the product.	Can be arranged into multilevel. No benefits or value considered.
Mkoba & Marnewick (2020)	Criteria of IT project success are: Level 1 – process and project management; Level 2 – deliverable and business; Level 3 – pass project auditing and Level 4 – pass project assurance	Levels 1 and 2 are success criteria as per Bannerman (2008) but levels 3 and 4 are success factors.
Elbaz & Spang (2020)	Project success literature is briefly reviewed and listed but the research does not define any success criteria to be influenced by CSF studied.	No success criteria used in the CSF framework is studied.
Holzmann & Mazzini (2020)	4 project success criteria of creative industries: Business & strategic criteria and efficiency & operational criteria.	Multilevel except no input level
Hughes, Rana & Dwivedi (2020)	Project success literature is briefly reviewed but no success criteria are used in the CSF framework studied.	No success criteria used in the CSF framework studied.
Olawale et al (2020)	Success criteria of smart city projects are iron triangle, impact, project objectives and stakeholder satisfaction.	Success criteria can be arranged into multilevel.
Rehman (2020)	5 success criteria used are project efficiency, impact on customer, impact on team, business success and preparing for future.	Multilevel based on Shenhar et al (2007)
Hadzaman, Takim & Nawawi (2020)	4 success measures of BIM-based projects are: socio-	Can be arranged into multilevel.

	organizational, legal, technical and financial.	
Raziq et al (2020)	Success criteria reviewed but not defined as the dependent variable for the study.	Studied only effect of organizational aspects on project success.
Breese, Couch & Turner (2020)	Success criteria are project objectives and realized benefits.	Incomplete levels of success
Doan, Nguyen & Nguyen (2020)	Success criteria used are time, budget, outcome, end use, satisfaction and efficiency.	No strategic/value success level.
Tam et al (2020)	Success criteria of agile software development projects are cost, time and customer satisfaction.	No business and strategic value success levels included.
Lameijer et al (2020)	Success criteria of process improvement projects are lumped under project goal achievement.	Can be arranged into multilevel
Saad, Zahid & Muhammad (2020)	Success criteria of construction projects are iron triangle, customer communication and stakeholder satisfaction.	No business and strategic success levels included.
Kang et al (2020)	Success criteria of NPD projects are meeting required NPD performance (e.g. technical performance and time to market performance) and achieving its intended goals such as customer satisfaction, market share and commercial success.	Can be arranged into multilevel
Demirkesen & Bayhan (2020)	Seven categories of success criteria of lean implementation namely the financial, managerial, technical, workforce, culture, government, and communication.	Can be arranged into multilevel.
Luo, Zhang & He (2020)	Success criteria used are time, cost & quality, health & safety, environmental performance, participants' satisfaction, user satisfaction and commercial value.	Can be structured into multilevel with strategic success and full continuums of stakeholder and value.

There are several more project success frameworks available in the literature which can be matched and fit into the multilevel framework based on the theory of change in Table 2.2 above, notably the project success model by Pinto & Slevin (1988b) which defines success based on the project vs client nexus as in Figure 2.11, SMART project

management framework by Hartman & Ashrafi (2004) to consider and balance key project management issues as in Figure 2.12 and the project excellence baseline (PEB) by IPMA (2018) in Figure 2.13 which is a points-based system to evaluate and score the project results and enablement factors which was developed based on the project excellence model by Gross & Whnes (2005) and Westerveld (2003); and EFQM excellence model (2003).

The project success model by Pinto & Slevin (1988b) states that success consists of project success and client success which can be matched to the multilevel success framework as in Table 2.2. The components of the project results of the PEB by IPMA (2018) are customer satisfaction, project team satisfaction, other stakeholders' satisfaction, project results proper (objectives fulfilled) and impact on the environment. Thus, the project results and various satisfactions based on objectives fulfilled correspond to the levels of the project success continuum and the stakeholders' continuum in the multilevel framework respectively, so they can be roughly matched as in Table 2.2. The SMART framework can also be matched because its three balance levels i.e. technical, business and social correspond roughly to the success and stakeholders' continuums as shown in Table 2.2.



(Numbers in parentheses are item numbers on Success instrument)

Figure 2.11 Project success model by Pinto & Slevin (1988)

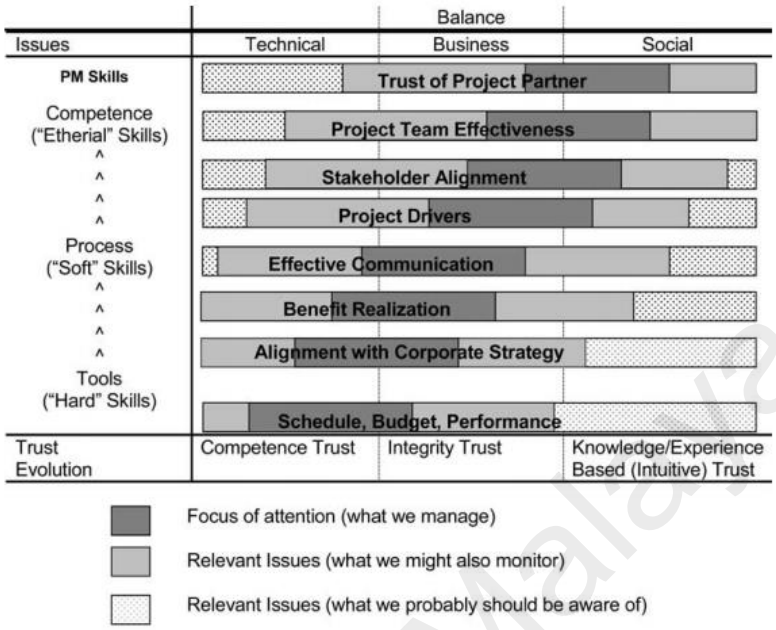


Figure 2.12 SMART Project Planning framework by Hartman & Ashrafi (2004)

Figure 2.13 Project Excellence Baseline by IPMA (2017)

2.3 Conceptual project success framework

The results of the literature review on numerous project success frameworks are synthesized and summarized into a conceptual framework as depicted in Figure 2.14 below. It has been matched and synthesized in Table 2.2 earlier that the seemingly different project success frameworks or criteria used in the past researches are in fact the various forms or versions of the framework developed based on the theory of change i.e. input, process, output, outcome and impact (IPOOI). The conceptual framework has six levels and criteria of project success continuum which are adequate as it covers the major stages of the life cycle, thus simple enough to be comprehended by users and agreed upon for adoption, application and adaptation by project personnel and organizations in industries or sectors.

DERIVED VALUE: RETURN ON INVESTMENT					
Operational		Tactical		Strategic	
STAKEHOLDERS					
Owner/ Sponsor	Team Contractor/ Consultant	Client/User	Customer	Business Internal	External
SUCCESS					
Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
INPUT	PROJECT		PRODUCT	ORGANIZATIONAL BENEFIT	
RESOURCE	PROCESS	PROJECT MANAGEMENT	DELIVERABLE	BUSINESS	STRATEGIC
Input	Process	Output	Outcome	Impact internal	Impact external
Legend: Blue box means added					

Figure 2.14 Conceptual multilevel project success framework

Sources: Enhanced from Bannerman (2008), UNDP (2012) and DFID (2013)

The Bannerman (2008)'s multilevel framework has originally five levels and criteria of project success, so it lacks the input level that is used in the results framework of UNDP (2012) and DFID (2013). The input level is required in order to enable determination of

indicators for assessing value for money (VfM) spent on projects, programs and portfolios to generate products, services or results within organizations. The VfM indicators are economy, efficiency, effectiveness and cost-effectiveness. According to the Center for Theory of Change (2019), when using the results framework, the following questions need to be answered:

- Economy: Are we buying inputs of appropriate quality at the right price? What are the main drivers of costs? How do you plan to manage such costs?
- Efficiency: How well do we convert inputs into outputs? Are we developing capacity from the scratch or are we building on what they already have?
- Effectiveness: How well are the outputs from an intervention are achieving the desired outcome?
- Cost-effectiveness: How much impact does a project achieve relative to the input that are invested in it?

Further, the Center for Theory of Change (2019) explains that the use of the theory of change and how its results framework helps to map any project in six steps i.e. 1) identify the long-term goals, 2) map backwards and connect the preconditions or requirements required to achieve that goal and explain why these preconditions are essential and adequate, 3) identify the basic assumptions about the context, 4) determine the interventions that the initiative will perform to create the desired change, 5) develop indicators to measure the outcomes to assess the performance of the initiative and 6) prepare a narrative to explain the logic of the initiative.

Welde (2018), Volden (2018) and Zidane Johansen & Ekambaram (2015) use the a slightly updated terms for the VfM indicators which are economy, efficiency, effectiveness, relevance and sustainability that are generated based on the input level. In fact, the project evaluation holistic framework by Zidane, Johansen & Ekambaram (2015)

has two more levels before the input level which are the objectives and identification of needs and can be utilized in practice as shown by their research. However, for this study, these two prior levels are not covered for simplicity and time constraints and reserved for further future research. Therefore, the input level needs to be added into the Bannerman (2008)'s framework to enhance it, making a total of six levels and criteria of project success as depicted in Figure 2.14 above.

The input level is concerned with provision of resources such as money, manpower, materials, equipment and tools and/or services like management, technical expertise, supervision and the like for the project to kick off and satisfactorily and successfully completed. After incorporating the input level, it is required to add owner/sponsor who can provide resources and/or services to project, programs and portfolios within organizations into the stakeholders' continuum as in Figure 2.14 above. Another two additional stakeholders are also added i.e. customers in addition to client/users and contractors/consultants to the middle stakeholders' continuum. Onto the derived value continuum at the top tier, an operational value is added at the left end as this is clearly included in the frameworks by Welde (2018), Volden (2018) and Zidane, Johansen & Ekambaram (2015) as illustrated in Figure 2.14 above. In short, the multilevel project success framework has three parallel continuums called success continuum as the bottom layer, stakeholder continuum as the middle layer and value continuum as the top layer as in Figure 2.14 above. Projects, programs and portfolios should be managed by organizations to be successful, satisfactory and creating value to the organization performance in the quest for excellence. Management of projects, programs and portfolios should optimize their contribution to the economic value added and strategic alignment of the organizations (Graham & Cohen, 2001; Morris, 2004).

CHAPTER 3: METHODOLOGY

This chapter discusses the methodology of this research. The approach and workflow of this study had been adapted to form a well-designed research structure which is described in this chapter to present the complete research methodology. It aims to inform the techniques used to collect data and generate the subsequent findings. Detailed researches are conducted to discover information from various individuals, groups of individuals or societies to learn a new perspective of a particular subject (Neubauer, Witkop, & Varpio, 2019). Different research approaches result in different questions to be answered, conceptualization and boundary of the study. This research firstly reviewed available literature in relevant topics from various journals, research reports, trusted study reports, government body publications, and other related publications in the Google scholar, libraries, etc. Many of the references examined provided useful secondary data and information pertaining to this research aim and objectives. Literature review is carried out to provide insights on the related topics and finding the implementations that have been done by others (Prastica, et al., 2018). It helped setting the next course of action for this research as outlined below.

3.1 Research framework

The high-level workflow of the research framework is briefly outlined in Figure 3.1 below. In essence, the research framework consists of three phases as follows:

- Phase 1 – Submission of the research proposal;
- Phase 2 – Submission of the first three chapters of the research and
- Phase 3 – Submission of the remaining three chapters and the final report.

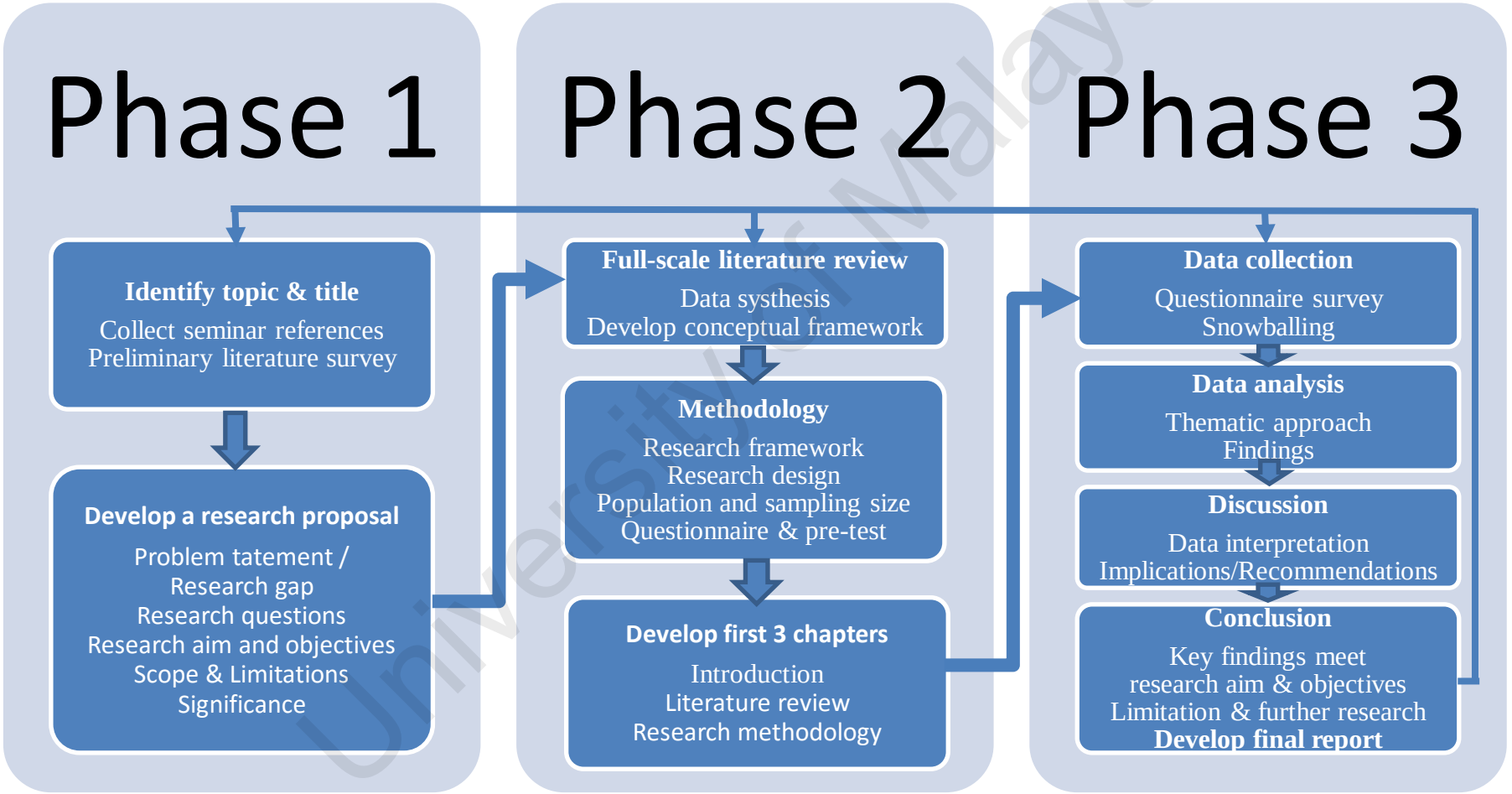


Figure 3.1 Overview of the research framework

The key stages of the research framework and the methods selected are concisely explained in Table 3.1 below.

Table 3.1 Stages of the research framework

Stages	Method
Overview study about project management in industries with emphasis within Malaysia	In order to have a big picture of the topic, many literatures related to project success, project, program and portfolio management and strategic organizational management were scoured through and studied briefly to understand and grasp issues faced the industries or sectors, starting from the oil and gas industry in the Malaysian context. Many current problems related to project success existing in the industries are learned and understood.
Determining and stating the research problem or gap in project management that are prevalent in industries	Many issues are identified in the literature which also many recommendations for improvement that is valuable for the industries to accept and implement. However, some problems such as low project success rates remain chronic and exist as challenges that are deemed by practitioners and researchers to be a part of project management that are hard to prevent. Thus, a research topic and its title were identified after several iterations.
Formulating of problem statement to identifying a research gap	The need to identify a research gap within this literature drove further exploration into low project success rates to search for a broader understanding and knowledge on the topic and to draw an informed conclusion of what can be contributed to this area of study.
Formulation of research aim and objectives	Upon achieving a satisfactory outcome on the research questions which enable further questions to be tested within this research, several research objectives are derived to constructively achieve the research aim. The aim of this study directed the investigation of the possibility of using project success framework to define, appraise and evaluate project success in industries or sectors.
Formulation of relevant research questions	After several possibilities of a problem statement or research gap, questions were developed to test the validity of the gap. This formulation of research questions changed several times as the gap for research being clearer and more precise over successive attempts.
Determining research scope, significance and limitations	This research has limited time and resources to complete therefore, the research scope needs to remain relevant within a reasonable boundary. The scope, significance and limitations for this research are carefully thought of in order to ensure the research is practical to be conducted within this course. The significance of the study is viewed from the perspectives of the

	practitioners and researchers as the end user of the research findings and conclusion. The limitations in this research are recommended for future studies. The scope of this research covers the project success rates and project success frameworks used by practitioners and researchers.
Conducting a full-scale literature review	In order to prepare to conduct this research on the targeted respondents, it is crucial to gain essential and adequate knowledge and expertise in the chosen topic of interest. There needs to be an interactive engagement of communication with the respondents to raise their interest to provide more information from their experience. Therefore, an extensive review of literatures is conducted within the research scope and limitations. The data and information have been digested and synthesized using comparative and contrasting analysis into a valuable and meaningful train of thought with constructive criticisms as required for enhancement of the project success framework. The information obtained are recorded within this research for further reference of the author and readers in general.
Designing the research methodology	The selected method to conduct this research set the direction for subsequent actions to be taken. Few researches within the Malaysian context provided much guidance for the direction of this research. The methods are closely followed and modified accordingly as the research progressed.
Data collection method	This research conducted the data collection qualitatively through structured questionnaire survey with 15 open-ended questions to be answered by the respondents in the form of free text entries. The questions were typed into the Google form to facilitate and ease its distribution through online and mobile devices. The population of respondents comprised different project personnel and different industries or organizations. The sampling was based on snowballing, starting from personal contact in the oil and gas industry. Most respondents provided further referrals as respondents. The data were collected in a tabulated format for efficient and effective review and analysis.
Data analysis method	The data collected in a Google form were transferred into a spreadsheet and analysed accordingly using the thematic concept. The perceptions and experiences shared by different respondents from different positions and industries provided insights that are varied and provided validity of the data. Data saturation is achieved by targeting respondents as many as possible (during the MCO period of the Covid-19 pandemic) to provide the reliability of the data.

Discussion, data interpretation and implications	The results of the data analyzed were interpreted and triangulated against the information gained from the review of literatures earlier in this study. This expanded further the existing knowledge on project success framework in particular and project management in general by providing some new and useful findings that can be beneficial for current project personnel and further evaluation in future research. The implications of the research were also discussed.
Conclusion, limitation and further research	This research concluded by stating whether the research findings have accomplished the intended aim and objectives of the research. Limitations of the research were identified and thus, the recommendations for further research were put forward.
Citing references	All references used in this research were listed at the end of the report.

3.2 Research design

Research must be properly designed to be robust because correlation does not imply causation, but a well-designed study can provide causation. The components of this research design comprise qualitative primary data collection, hermeneutic phenomenology research tradition, exploratory research purpose, deductive research reasoning, descriptive research claim and homogenous purposive sampling which are succinctly explained below.

3.2.1 Qualitative primary data collection

Data can be derived from primary or secondary sources. Primary data are directly retrieved from a certain population of people, therefore being a first-hand information. Secondary data are obtained from recognized written publications such as from journals, research papers, study reports, governments and other publications. Reviewing secondary data is vital throughout the research particularly during the literature review in order to provide essential supportive empirical evidences, identify the research gap or problem statement and to develop the solution or cure for the problem. Some research would also opt to conduct the complete research by using secondary data e.g. meta-analysis of

existing research data, as the means to make comparison and contrast analysis and appropriate conclusions and recommendations. For this research, available secondary data related to project success are quite voluminous and extensive, so the review had focused on project success framework and/or criteria to produce substantial findings on the current status of the chosen topic and to ensure that the problem is still relevant and of practical importance and utility.

Primary data can be collected through qualitative and quantitative methods and are both very commonly adapted in social science researches such as this study. The qualitative method for collecting primary data is often performed through in-depth interviews with research respondents being made of experts while the quantitative method is performed through surveys and questionnaires whose respondents can be both experts and non-experts. Qualitative data collection provides multiple perspective of a context to be discovered and comprehended through various viewpoints and data sources (Baxter & Jack, 2008). In contrast, quantitative data collection is conducted from wide-ranging respondents, which is essential for a generalized identification and characterization of a phenomenon through comparison of the respondent's responses. The qualitative method inquiries from the respondents through open ended questions to answer the "why" and "how" about the topic to permit elaboration of ideas in order to obtain data from them. Gathering of detailed information would enhance the understanding of researchers (Keers & Fenema, 2018). On the other hand, in quantitative research survey, focused and pointed closed ended questions mostly with Likert scale answers are developed to test specific variables that are derived from hypothesis.

The qualitative data gathering involves document examination. The documents read include previous researches from Google Scholar, online reports in internets, library books and miscellaneous documents as necessary. Where possible, peer-reviewed articles

are preferred but conference papers and reliable online publications will be used to increase relevance of the subject matter and up to date information with the website link and access date provided in the reference.

In general, documents are preserved recording of a person's thoughts, actions or creations (Potter, 1996). The emphasis is on discovery and description of the research topic, including search for contexts, underlying meanings, patterns and processes, rather than mere quantity or numerical relationships between two or more variables (Altheide, 1997). The examination of documents may also provide confirmatory evidence of the information obtained from thoughts, discussions, observations and experiences. In the document examination i.e. during the literature survey, attention is focused on studying and understanding the current percentage of project success rate and the four components of project success i.e. from the iron triangle, critical success and failure factors, contingency variables, success criteria and project success framework. The reasons for using a multilevel project success framework are also studied and recorded. Critical thinking is used to identify and evaluate strengths and weaknesses of the existing project success frameworks or sets of success criteria, so that enhancement can be proposed and developed. The key findings and research methods in previous researches are noted and compared for appropriate synthesis and triangulation.

This research collects primary data to gain insights from expertise and experiences of the individuals working in the industries or sectors that participate as the research respondents. For this research to investigate a phenomenon using the respondents lived experiences and perceptions (Neubauer, Witkop, & Varpio, 2019), the qualitative method using the questionnaire survey with open-ended questions as the research instrument is applied. The quantitative and qualitative data collection methods can be complementary to one another due to their distinct approaches and can be triangulated. However, direct,

face to face interviews to gather as much information as possible from the respondents about the topic and obtain the most advantageous information for research (PressAcademia, 2018) was not able to be administered due to the MCO period due to the Coid-19 pandemic.

3.2.2 Hermeneutic phenomenology research tradition

Creswell (2007) described narrative, phenomenology, grounded theory, ethnography and case study as five research traditions in the qualitative data collection. Gentles, Charles, Ploeg, & McKibbon (2015) critically examined the phenomenology, grounded theory and case study traditions in qualitative data collection researches. The grounded theory approach emphasizes largely on interview data and only to a certain extent document data that are flexible to be used in developing a substantial theory and emphasizing on the understanding of society while in a case study, the researchers need to collect data through observations, interviews, documents and so forth to analyze a single or small number of bounded cases which is studied within its distinct context. They further explained that in order to learn and understand about human lived experiences in qualitative research, some first-person accounts are necessary to achieve this approach that are generally obtained through participant interviews.

Phenomenological researches can generate useful outcomes from the experiences of others (Creswell, 2007). Neubauer, Witkop, & Varpio (2019) explain that a phenomenology can be explained descriptively or interpretatively. In an interpretive or hermeneutic phenomenology, the researcher is not bias-free, and has experience in their reality of the phenomenon, hence making reflections of their own experiences on the theme of data collected from their research participants while the researcher in a descriptive or transcendental phenomenology approach is non-biased and make interpretations based on a phenomenon that is not in their reality but within their

consciousness and therefore exclude them from being perceptive during data collection and analysis.

Research applies certain traditions characterized by its unique approach for collecting data and analysis (Gentles, Charles, Ploeg, & McKibbon, 2015). The phenomenology tradition fulfils this research aim by focusing on various individuals and their experiences (Creswell, 2007) through questionnaire survey with open-ended questions comparable to Yap, Abdul-Rahman, & Chen (2017). As the author lives in the reality of the phenomenon being studied, so his own experiences are reflected in the interpretations of the interview data and thus this phenomenon was approached hermeneutically.

3.2.3 Exploratory research purpose

A research can have either a single or multiple purpose which is a desire to produce results for fulfilling the identified research gap. An important measure in framing a research aim and objectives is to first determine the purpose of the research. The purpose of a social research can be categorized as exploratory, descriptive or explanatory. Akin to Yap, Abdul-Rahman, & Chen (2017), this phenomenological research has an exploratory purpose as the research desires for investigations to discover and establish information about the chosen topic.

Data from exploratory research methods tend to be qualitative that are achieved by means of interviews and brainstorming sessions. On the other hand, other research purpose such as descriptive studies desires to describe characteristics of populations and illustrate events that occur while explanatory studies desire to explain phenomena and make predictions of future occurrences of events. Data for descriptive studies can be either qualitative or quantitative that can be collected by means of surveys to determine statistics whereas data for explanatory studies are collected through quantitative means in order to generalize results for the population. This research is an explanatory study that

intends to identify the levels and criteria of project success framework, to determine any gaps in the use and weaknesses of the framework to enhance it and collect empirical evidence of its relevance, completeness of its criteria and its practical utility.

3.2.4 Deductive research reasoning

Reasonings are used to relate theory with observations of the research and it can be either inductive or deductive. Inductive reasoning is used by scientists and academicians to form hypotheses and theories while deductive reasoning applies the hypotheses and theories into observations of specific situations (Trochim, 2006). The comparison of the inductive vs deductive reasonings is shown in Figure 3.2 below. Inductive reasoning uses specific instances to produce general principles and deductive reasoning uses general principles to produce specific conclusions (Herr, 2007).

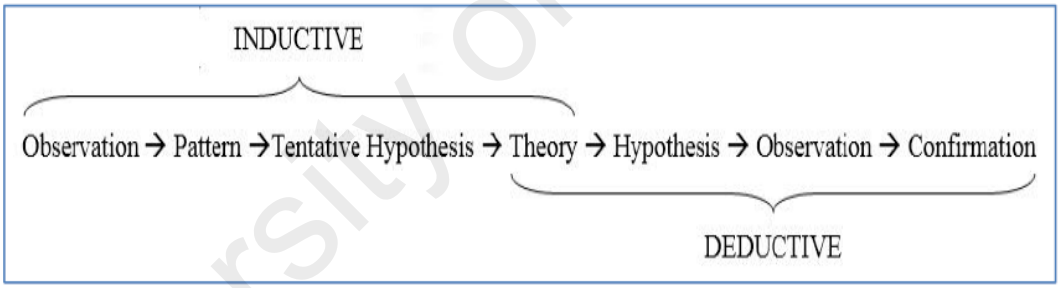


Figure 3.2 Inductive and Deductive Reasoning (Trochim, 2006)

This study uses the deductive reasoning in order to apply theories identified from previous researches in the literatures and to observe the applicability of these theories in the industry and to receive results or feedbacks from the industry. The conceptual project success framework is developed based on the literature review and tested among project personnel as respondents to the questionnaire survey after which the data are collected and analyzed before being interpreted and triangulated with relevant research findings obtained during the literature review.

3.2.5 Descriptive research claim

Descriptive claim in research is directed towards the goal of making current best practices available to all through attempts to document and formalize existing methods (Behdad, Berg, Thurston, & Vance, 2013). In contrast, normative claim in research is geared towards a new method on how it should be done and therefore seek to improve existing practices (Behdad, Berg, Thurston, & Vance, 2013).

This aim of this research is to enhance and formalize a standardized and holistic project success framework for defining, appraising and evaluation of project success at various stages of the asset life cycle on a cradle to cradle basis. Thus, it uses the descriptive research claim by identifying the levels and criteria of project success framework, determining any gaps in the use and weaknesses of the framework and finally enhancing the framework to be in a standardized form and holistic in nature i.e. having essential levels and criteria of success to adequately define, appraise and evaluate project success by practitioners or researchers. The enhanced framework is then made available to all be they project personnel, industries or organizations.

3.2.6 Homogenous purposive sampling

Researches are conducted on a certain population by using sampling techniques to choose a representative sample of subjects from the population. Population could mean people, things or cases that are the subject of research (Etikan, Musa, & Alkassim, 2016). All the sampling strategies in some sense are purposeful to provide representative data for collection and analysis. Selecting the type of population sampling for conducting a qualitative research depends on the nature and type of the research that in turn varies according to its context and objectives (Gentles, Charles, Ploeg, & McKibbon, 2015). They further state that the theoretical sampling method is intended for developing or

integrating conceptual categories within a study in terms of their properties and dimensions which is more commonly used on the grounded theory tradition for research.

Purposive sampling and convenience sampling are studied for their respective appropriateness and applicability in this research. Both techniques are of nonprobability sampling type which does not provide a good representation of the population due to the subjective nature in choosing the samples which can lead to bias in the results. Despite of this limitation, nonprobability sampling is particularly useful when the population size is very large, thus randomization is impossible. Therefore, it is used for researches that do not target producing results by generalization based on an entire population. Compared to the probability sampling type, it requires less of the researcher's resources, time and workforce in order to collect data.

In this study, the researcher identifies respondents that are willing to share their knowledge and experiences according to what the needs to be known (Etikan, Musa, & Alkassim, 2016). This research intends to approach the targeted group of knowledgeable and experienced respondents whose views are most sought after, when there is a broad information area to be covered that requires in depth content that this non-probability sampling technique would be able to gather (Gentles et al, 2015). Etikan, Musa, & Alkassim (2016) explain that the purposive sampling method primarily emphasizes on reaching data saturation whereby a comprehensive understanding would have been achieved. In contrast, convenience sampling generalizes the knowledge gained from the respondents as a representative of the population. They further state that having the requirement for people with particular characteristics would have the researcher inclining towards purposive sampling to be better able in assisting with research that are relevant to that characteristics.

Therefore, this study adopts the homogenous purposive sampling by targeting those who participate or are involved in projects, programs and portfolios within organizations in any industries or sectors who would possess almost similar knowledge and experiences in a project environment. Purposive sampling is also more typically used in a qualitative study compared to convenience sampling that is mostly used for quantitative study, although the latter is also applicable to the qualitative method. This research also uses the convenience sampling by snowballing the questionnaire survey, starting from contacts in the oil and gas industry who then suggested referrals as respondents until no more responses were received.

3.3 Data collection

3.3.1 Research questions

In developing the research questions, it is essential and useful to design them to be open ended questions (Gentles et al, 2015) to adequately explore the topic, gather data as much as possible and to receive different perspectives from respondents about the same or similar topic. The research questions were formulated to gather data for accomplishing the research aim and objectives. The sub-questions under each main question of the research are also kept open ended to avoid a “yes” or “no” answer unless it is necessary to do so. Open-ended questions are thus able to foster discussions and encourage the interviewee to provide information and thoughts in more depth within their knowledge and experience (PressAcademia, 2018).

3.3.2 Questionnaire survey questions

The questionnaire survey contains sixteen open-ended questions with four questions on the demography of the respondents to provide profiling during the data analysis and twelve questions on the first two research questions as shown below. The questions were developed by the researcher and reviewed by the academic supervisor on several

iterations to ensure relevant questions were formulated to gather the necessary data to answer the research questions and thereby accomplish the research aim and objectives before agreement was made.

Table 3.2 Questionnaire survey questions

Questions of research and questionnaire survey	**Response Free text**
1. Demography:	
1.1. Job position/title:	
1.2. Work experience (in years):	
1.3. Industry/sector:	
1.4. Email (optional):	
2. What are the levels and criteria of success of projects, programs and portfolios in your organizations?	
2.1. Is your organization satisfied with the success of projects, programs and portfolios undertaken by your organization?	
2.2. Does your organization define and evaluate success of projects, programs and portfolios in your organization?	
2.3. What levels and criteria are used by your organization to define and evaluate the success of projects, programs and portfolios in your organization?	
2.4. What indicators are used to measure the respective success criteria of projects, programs and portfolios in your organization?	
2.5. Who are involved in defining and evaluating the success of projects, programs and portfolios in your organization?	
2.6. What is the goal of delivering projects, programs and portfolios in your organization?	
2.7. How often does your organization define and evaluate the success of projects, programs and portfolios of your organization?	
3. Which success criteria are considered more important and often used in your organization?	
3.1. Which success criteria of projects, programs and portfolios are considered more important in your organization?	

3.2. Which success criteria are more often used in your organization to define and evaluate delivery of projects, programs and portfolios?	
3.3. Why does the use of the success criteria improve the success rate of projects, programs and portfolios in your organization?	
3.4. How will your organization adapt the success criteria if the project management body of knowledge and standard are changed from knowledge areas and process-based to performance domains and principle-based respectively?	
3.5. Any suggestions or recommendations for improving the success of projects, programs and portfolios in your organization?	

3.3.3 Pilot study

A pilot study was conducted to assess on the quality of the questionnaire survey design by receiving any feedbacks of any flaws and weaknesses and also to ascertain that the research questions are rational and constructive to ensure that the information collected is clear, precise and complete (Yap, Abdul-Rahman, & Chen, 2017) to meet the research needs before it is distributed to respondents to contribute their thoughts and experiences. Review of the questions was first done with six experienced industry practitioners, three seniors who had more than ten years of working experience in the construction industry and three juniors with more than six but less than ten years of related experiences. They consisted of individuals with different roles in a project team. Fine tunings were made based upon the comments made by the industry practitioners before they were subjected to review and comment by two academics with doctoral qualification to make assessment and further improvement, if necessary.

In a trial survey, no major hiccups or issues were experienced in the research respondents in providing their responses to share their thoughts, expertise and experiences. Few respondents clarified with the researcher the meanings of one or two questions. Some respondents commented the questions were interesting to them and relevant to their work. This effectively provided the motivation for some of them to

suggest referrals as the questionnaire survey was conducted based on snowballing sampling. So, no further adjustments were made on the questions which led to the conclusion that the questions were rational and constructive, thereby fit for a full-blown questionnaire survey to be kicked off.

3.3.4 Research respondents

The respondents for this research were chosen based on the variety of information they can contribute. The unit for analysis in this research is experience and expertise of individuals who participate or are involved in projects, programs and portfolios either as members of the project team, participants and those who are involved in projects, programs and portfolios, internal and external stakeholders, client, end users and customers, owner or sponsor and contractors and consultants. The participants were therefore chosen in accordance with specific criteria in order to reliably contribute to the structure and character of the experience under investigation (Sousa, 2014). This study involved respondents from client and provider organizations from various sectors or industries for collecting essential data.

The combinations of industry practitioners from different backgrounds is important to produce deep and balanced opinions of the research topic (Yap, Abdul-Rahman, & Chen, 2017). To retain the required empirical evidences and involvement of parties with different priorities, this study identified the project clients, contractors, consultants and stakeholders who would make significant contributions based on their different and diverse expertise and experience in a project environment. Some of the initial contacts who become the early respondents to the survey are working in the oil and gas industry who recommended referrals including from construction, government and property sectors. The respondents can be from client, contractor/consultant or business owner organizations as long as long as they participate or are involved in projects, programs and

portfolios so that they would be able to provide useful information for the cause of this research. Respondents are employees of organizations within any sectors who provide their job title or position within their organizations along with their number of years of their work experience and the sector they are working in. The participants were sent the questionnaire with an invitation for them to participate in the survey on a voluntary basis and upon their agreement provide their responses through the Google form. Name and email were made optional to provide in the questionnaire survey to provide confidentiality if required by the respondents. Upon receipt of their respective responses, a thank you note is sent to the respondents to notify and acknowledge receipt of their responses.

3.3.5 Profiles of respondents

The respondents were inquired about their current role within their organization and their work experiences in the construction industry. The names and the identity of the organizations that the respondents belong to are not included in this survey for reason of confidentiality and are coded to preserve anonymity. It was expected that the job title or position of the respondents can be classified into four categories: top management, management, technical/executive and non-technical personnel. Their work experience can be classified into between 5 to 10 years, between 10 to 20, between 20 to 30, between 30 to 40 and above 40 years.

3.3.6 Conduct of questionnaire survey

Survey or interview in academic research can be conducted through different structures from being fully structured, semi-structured or unstructured. This research adopted the semi-structured method for questionnaire survey with open-ended questions with the focus to gain insights on the research questions and ultimately accomplish the research aim and objectives. Semi-structured questionnaire survey with free text entries can enable more in-depth understanding for the researcher by developing and itemizing

the survey questions where the respondents can provide a series of answers for complex research questions and ask clarifications as necessary from the researcher (Yap, Abdul-Rahman, & Chen, 2017). The questionnaire survey was administered in the form of a online Google form which can be accessed via mobile devices. The participants were informed that they require about thirty minutes to respond to all questions in the survey. All questions were made mandatory entries except for optional questions.

3.3.7 Questionnaire, variables and indicators

The research requires the respondents to identify the levels and criteria of project success that they have used while participating or involved in projects, programs and portfolios within their organizations to reveal any gaps in their use of project success framework or any weaknesses of the framework used. Respondents were encouraged to express themselves with their knowledge and experiences without introducing bias in the response (Yap, Abdul-Rahman, & Chen, 2017). All the survey respondents were asked sixteen standardized open-ended questions of which three are summarized in Table 3.1 below.

Table 3.3 Questionnaire, variables and indicators

Key questions of survey	**Variables**	**Indicators**
2.1 Is your organization satisfied with the success of projects, programs and portfolios undertaken by your organization?	Success rates	Yes/No Mostly yes/no High, Medium or Low
2.2 Does your organization define and evaluate success of projects, programs and portfolios in your organization?		Yes/No Mostly yes/no
2.3 What are the levels and criteria of success of projects,	Success levels	Multilevel of success: input, process, project management, deliverable, business and strategic.

programs and portfolios in your organizations?		Multitier: Success continuum Stakeholder continuum Value continuum
	Success criteria	Project management/Iron triangle vs project/product success List of some criteria Multicriteria: Input, Process, Output, Outcome and Impact
2.4. What indicators are used to measure the respective success criteria of projects, programs and portfolios in your organization?	Success indicators	Relevant KPIs for success criteria: Process/Technical excellence Scope, cost and schedule Quality/Performance HSES Resource utilization Risk assessed and mitigated Value created Stakeholder need and expectation satisfied Iron/Golden triangle, triple constraint Tetrahedral diamond Multiple constraints
2.5 Who are involved in determining project success criteria in your organization?	Stakeholders satisfaction	Owner/sponsor, Project team Contractor/Consultant Client/Users Customers Internal stakeholders External stakeholders
2.6 What is the goal of delivering projects, programs and portfolios in your organization?	Value creation	Strategic – Value creation, Impact Tactical – Business success, Outcome Operational – Deliverable, Output, Process, Project management
2.7. How often does your organization define and evaluate the success of projects, programs and portfolios of your organization?	Frequency of success planning and measurement Time dimension	Weekly, Monthly, Quarterly, Half-yearly, Yearly. At every key phases of asset life cycle (cradle to cradle concept) i.e. during conception, development, delivery, operations and decommissioning.
3.1. Which success criteria of projects, programs and portfolios are considered more important in your organization?	Higher success levels	Strategic and business levels Value continuum
3.2. Which success criteria are more often used in your organization	Lower success levels	Process, project management and deliverable levels

to define and evaluate delivery of projects, programs and portfolios?		
3.3. Why does the use of the success criteria improve the success rate of projects, programs and portfolios in your organization?	Rational for success management	For continuous improvement For performance benchmarking For strategic alignment For value creation For stakeholder satisfaction For success management For organizational excellence
3.4. How will your organization adapt the success criteria if the project management body of knowledge and standard are changed from knowledge areas and process-based to performance domains and principle-based respectively?	Readiness to change in success management	Change management: Awareness Adopt Adapt Apply Assimilate Current trend from process to principle based BoK
3.5. Any suggestions or recommendations for improving the success of projects, programs and portfolios in your organization?	Improving success management	Pre-requisite levels i.e. input, objectives and identifications of needs and triggers. Incorporate organizational change management between out and outcome (Benefits management). Make success management part of performance organization. Optimize success factor Optimize contingency factors

3.3.8 Scope and limitations

The scope and limitations of this research shall be limited to the topic of project success framework, success criteria and levels, stakeholders and derived value, excluding the studies on critical success factors and contingency factors. The limitation of the research was snowball sampling method due to non-accessibility to organizations to distribute the questionnaire survey directly to respondents. The duration of the study is limited to the timeframe allowed by the university. The location of the research is within Malaysia.

3.4 Data analysis

Data collected in the form of responses to the questionnaire survey were transferred into a spreadsheet file in order to perform the content analysis effectively and categorized based on themes in this study. All responses were checked and found in good order and fit for analysis, so none was discarded (PressAcademia, 2018). The data collected were assigned to predetermined and emerging themes that allowed information sorting with similar content and properties to be grouped together (Yap, Abdul-Rahman, & Chen, 2017). The thematic data analysis framework used in this research is shown in Figure 3.3 below. Subsequently, the links between the themes were identified towards understanding how they will produce the required answers for the research questions.

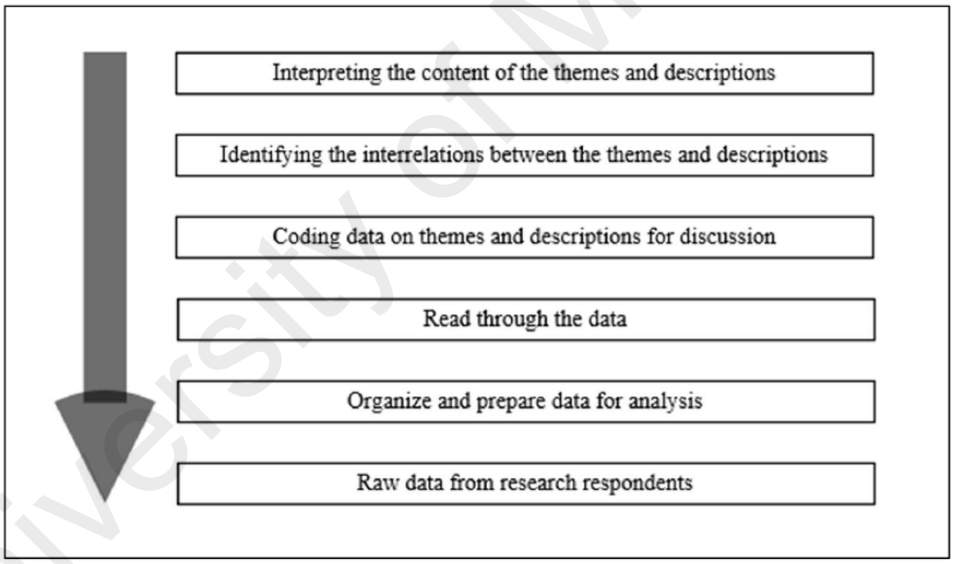


Figure 3.3 Thematic data analysis framework

(adapted from Yap, Abdul-Rahman, & Chen, 2017, p.1261)

The number of the responses was still manageable for manual analysis of the data collected by identification of keywords which were then classified into themes. First, the responses were subjected to demographic analysis followed by the project success data analysis. The themes in this research are the success levels and criteria, multiple stakeholders and value added by projects, programs and portfolios of the organizations.

The keywords for success levels and criteria were adopted from the multilevel project success framework by Bannerman (2008). These keywords were then matched with the keywords mentioned by the respondents for each question of the questionnaire survey. The keywords were finally classified into their corresponding success levels and the job tittles or positions of the respondents.

In summary, this phenomenological research investigates the use of a multilevel project success framework among project personnel, identifies the success levels and criteria, determine any weaknesses of the framework and gaps in its use among project personnel and explores the possibilities of enhancing it to be holistic and fit for use in industries or sectors based on the research findings. Primary data were collected through qualitative structured questionnaire survey with open-ended questions, free text entries and the snowball sampling method in order to maximize the number of responses and gather essential data for analysis to generate the research findings. However, the data collection was restricted by the movement control order (MCO) period due to the Covid-19 pandemic.

CHAPTER 4: RESULTS

This chapter comprises the research findings of the research. Based on the research objectives, research questions and questionnaire survey questions, the fieldwork data are collected and analyzed using the selected techniques mentioned in the research methodology. Data analysis for this research consists of several stages which are segregated and sequenced according to the different themes of the data set. The research findings for each question in the questionnaire survey are presented below one by one.

4.1 Demographic analysis

4.1.1 Responses and work experience

The number of responses received and the summary of the work experience of the respondents are shown in Table 4.1 below. The total number of responses received is fifty-two (52). Krijcie & Morgan (1970) state that the suitable sample size for a large population of 100,000 is 384. The number of questionnaire surveys sent out is approximately 500 and 52 responses were received, giving a response rate of 52 over 500 which is 10.4%. The total of the work experience of the respondents is 1198.5 years with an average of twenty-three (23) years and a range between 5.5 to 44 years.

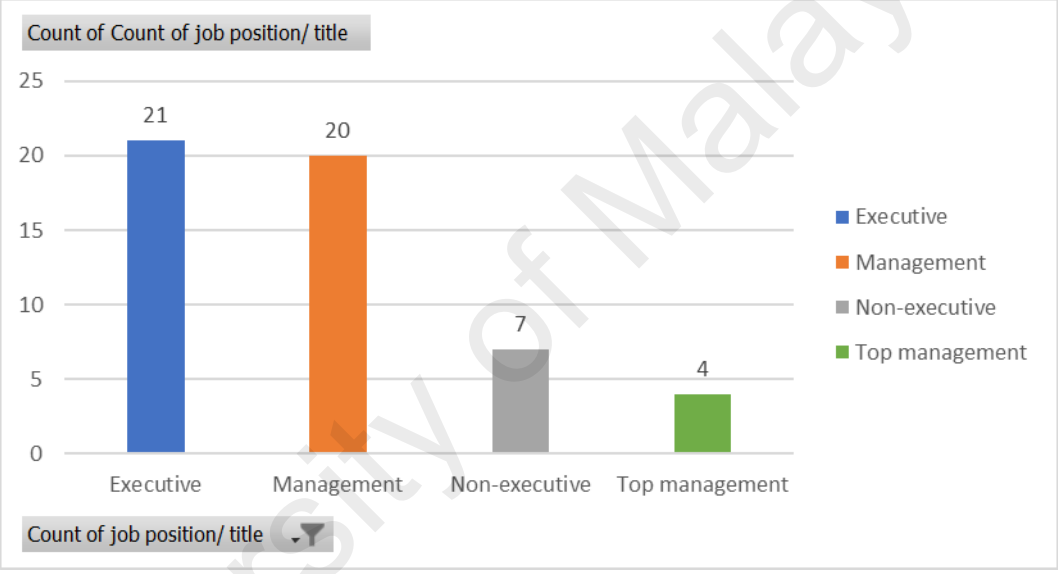
Table 4.1 Responses and work experience

Work experience	Number in years
Total responses	52
Total experience	1198.5
Average experience	23
Range	5.5 - 44

4.1.2 Category of job titles of respondents

The category of the job title or position of the respondents is shown in Figure 4.1 below. There are four respondents who are top management such as CEO and senior management, twenty are in the middle management, twenty-one are technical or executives and four are non-executives.

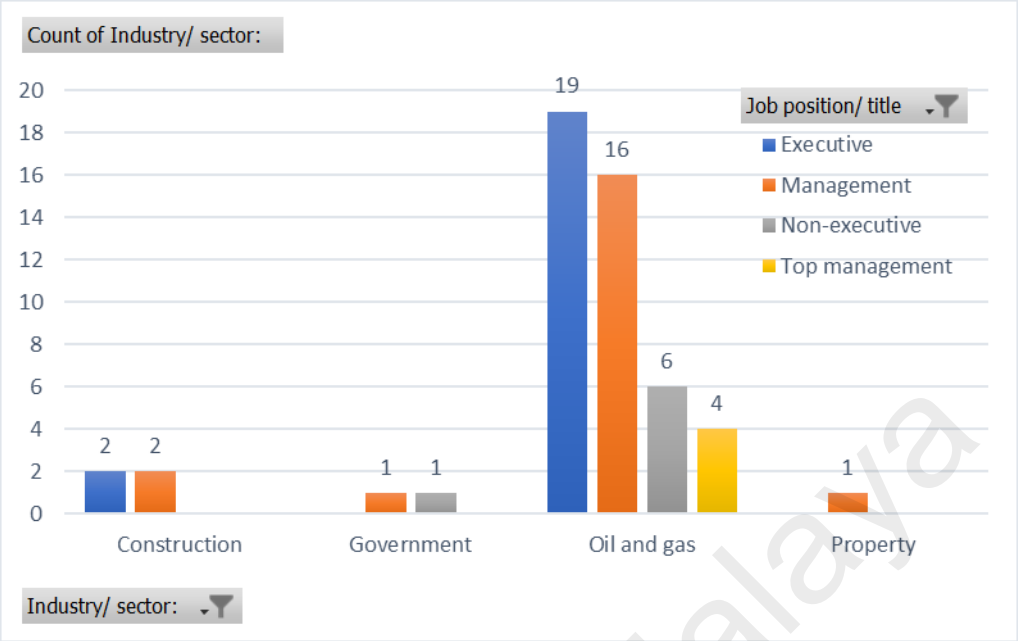
Figure 4.1 Category of job titles of respondents



4.1.3 Category of sectors of respondents

The category of sectors of the respondents are depicted in Figure 4.2 below. There are 45 respondents in the oil and gas industry, 4 in construction, 2 in government and 1 in property sector. This breakdown is reasonable as the snowballing sampling was started from personal contacts working the oil and gas industry who then suggested referrals which come from other sectors.

Figure 4.2 Category of sectors of respondents

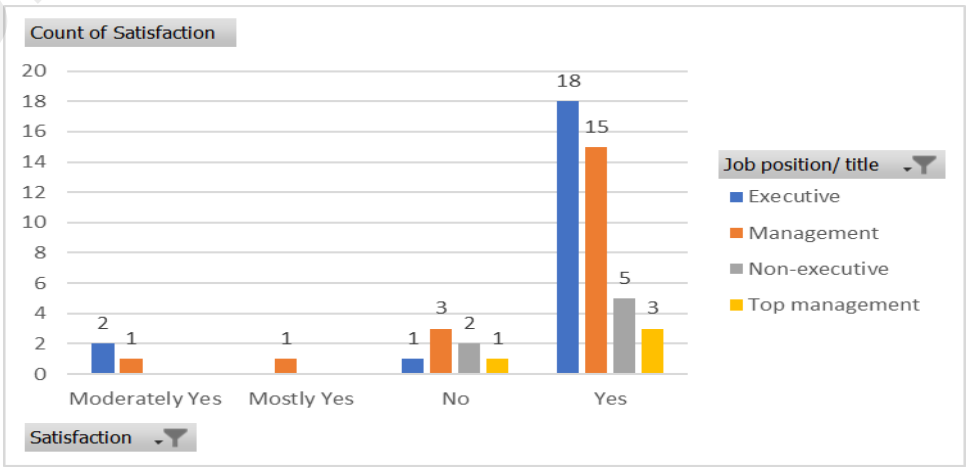


4.2 Analysis of project success data

4.2.1 Satisfaction with project success rates by respondents

Most respondents stated satisfied with the project success rates within their respective organizations with forty-one saying Yes, three saying moderately Yes and one saying mostly Yes while seven saying No as shown in Figure 4.3 below. Later, it can be deduced what the definition of project success used by the respondents when responding to this question of the questionnaire.

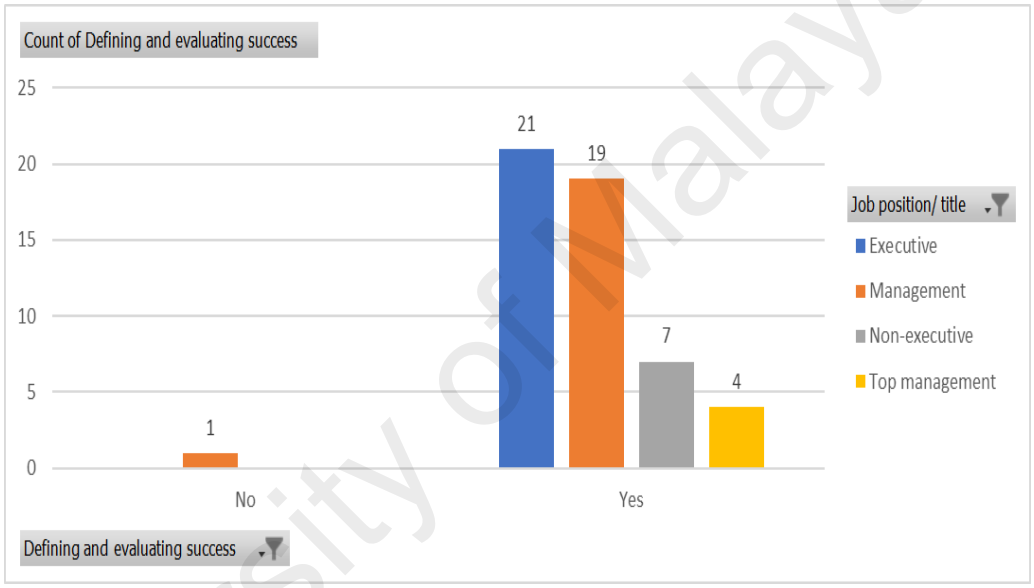
Figure 4.3 Satisfaction with project success rates of respondents



4.2.2 Existence of project success management activities

All respondents replied in affirmative to the question whether their organizations project success management to define, appraise and evaluate project success in their course of working i.e. saying Yes (51) while saying No (1) as shown in Figure 4.4. However, the quality or adequacy of the project success management can be deduced later, from the responses to subsequent questions.

Figure 4.4 Existence of project success management among respondents



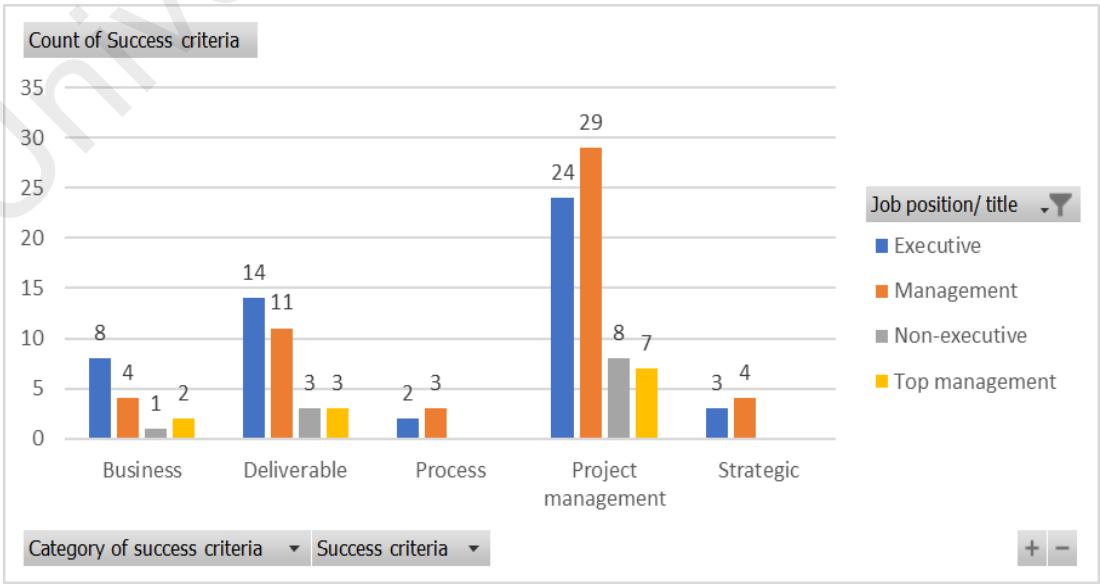
4.2.3 Success levels and criteria by respondents

The keywords mentioned by the respondents were identified and classified into the matching categories in terms of success levels and criteria (themes) of the conceptual project success framework as shown in Figure 4.5. The breakdown of the categories of the success levels and criteria in a descending order is as follows:

- project management (68)
- deliverable (31)
- business (15)
- strategic (7)
- process (5)
- Total (126)

So, most respondents focus more on project management success, deliverable and business successes and less on strategic and process successes.

Figure 4.5 Category of success levels and criteria mentioned by respondents



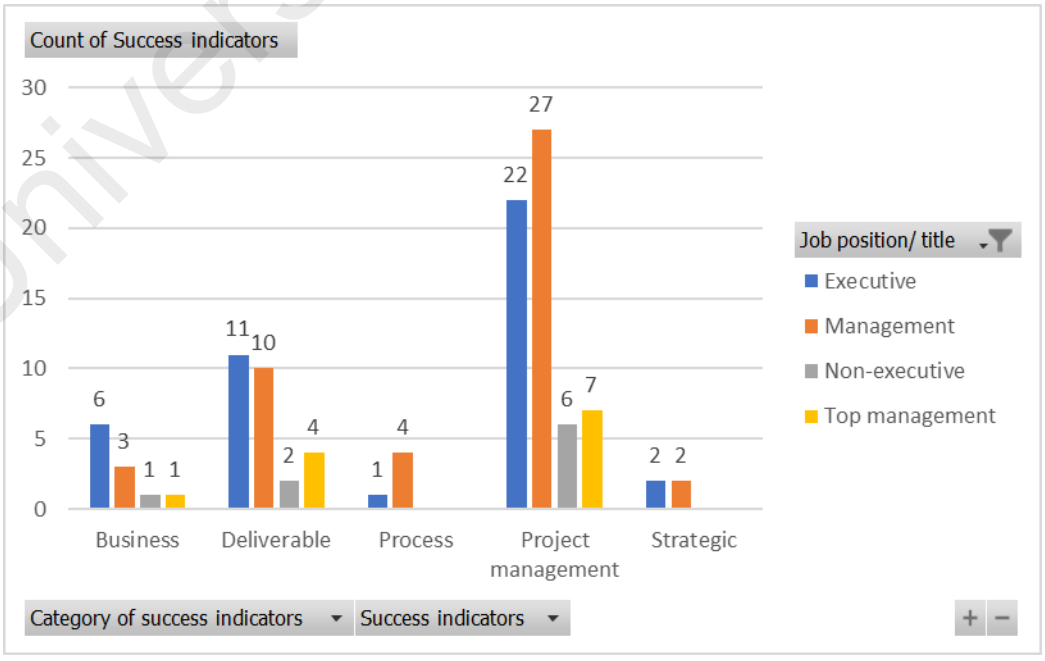
4.2.4 Success indicators cited by respondents

The keywords cited by the respondents were identified and classified into success levels and criteria as the themes in this research as depicted in Figure 4.6 below. The breakdown of the categories of the success indicators according to success levels and criteria as follows:

- project management (62)
- deliverable (27)
- business (11)
- strategic (4)
- process (5)
- Total (109)

Again, most respondents focus more on project management, deliverable and business successes and pay less attention on strategic and process successes.

Figure 4.6 Category of success indicators by respondents



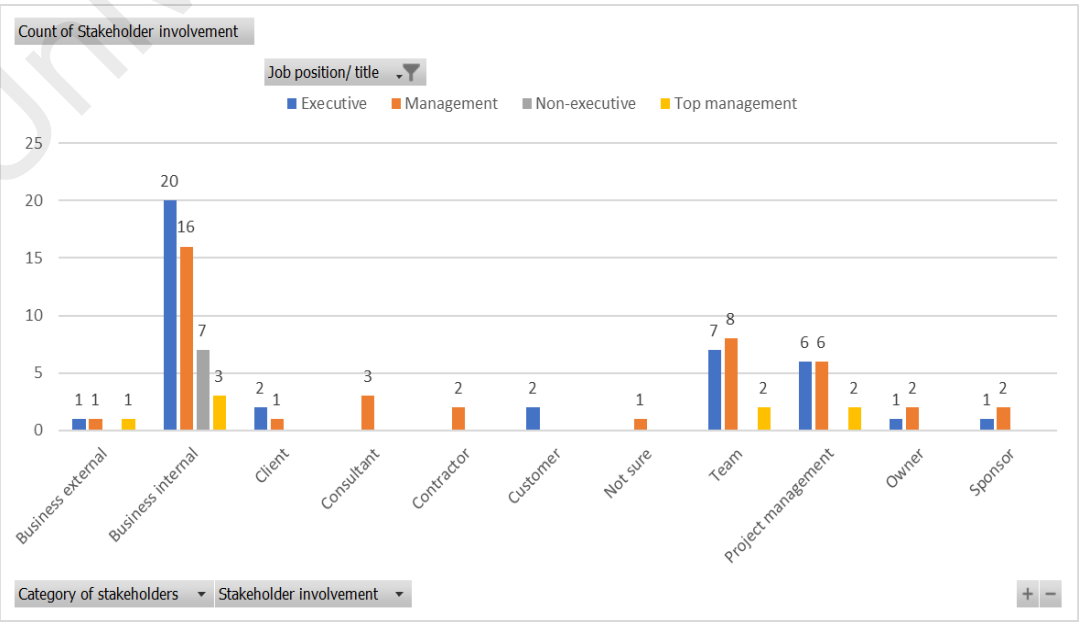
4.2.5 Stakeholder management

The keywords representing stakeholders mentioned by the respondents were identified and classified into categories of stakeholders (themes) contained in the conceptual framework as shown in Figure 4.7 below. The breakdown of the stakeholders mentioned are as follows:

- business internal (46), team (17) and project management (14)
- client (3), user (0) and customer (2)
- contractor (2) and consultant (3)
- owner (3) and sponsor (3)
- external stakeholders (3)
- not sure (1)
- Total (97)

Hence, most respondents focus heavily on internal stakeholders, team and project management (77) and less on client, user and customer (5), contractor and consultant (5), owner and sponsor (6), and external stakeholders (3).

Figure 4.7 Category of stakeholders mentioned by respondents

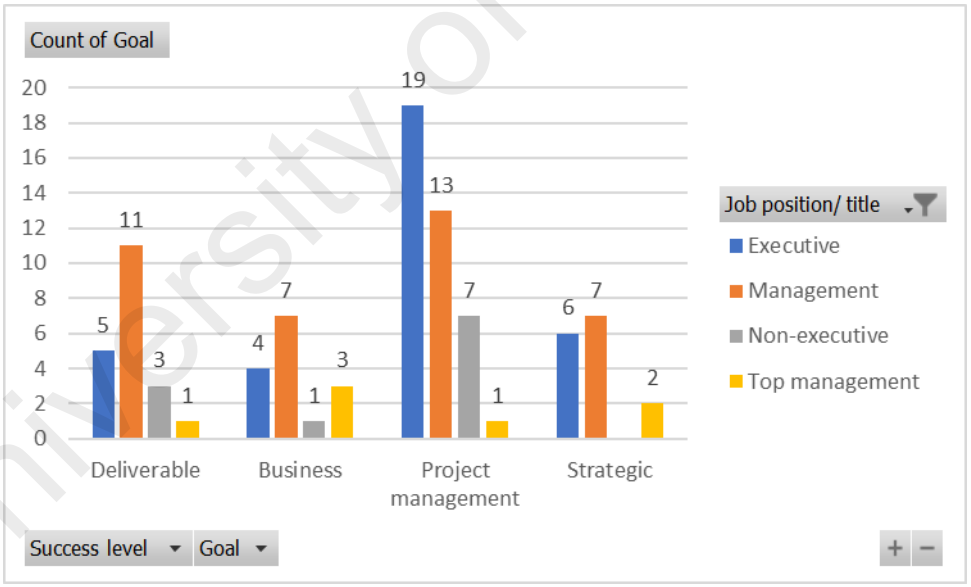


4.2.6 Value management

The keywords that represent the goal or derived value of projects, programs and portfolios within organizations and were mentioned by respondents during the questionnaire survey were identified and classified into themes with the value continuum of the conceptual project success framework as depicted in Figure 4.8 below. The breakdown of the categories of goals in a descending order is as follows:

- Operational value: project management (40) and process (0)
- Tactical value: Deliverable (20)
- Strategic value: business (15) and strategic (15)
- Total (90)

Figure 4.8 Category of goals cited by the respondents



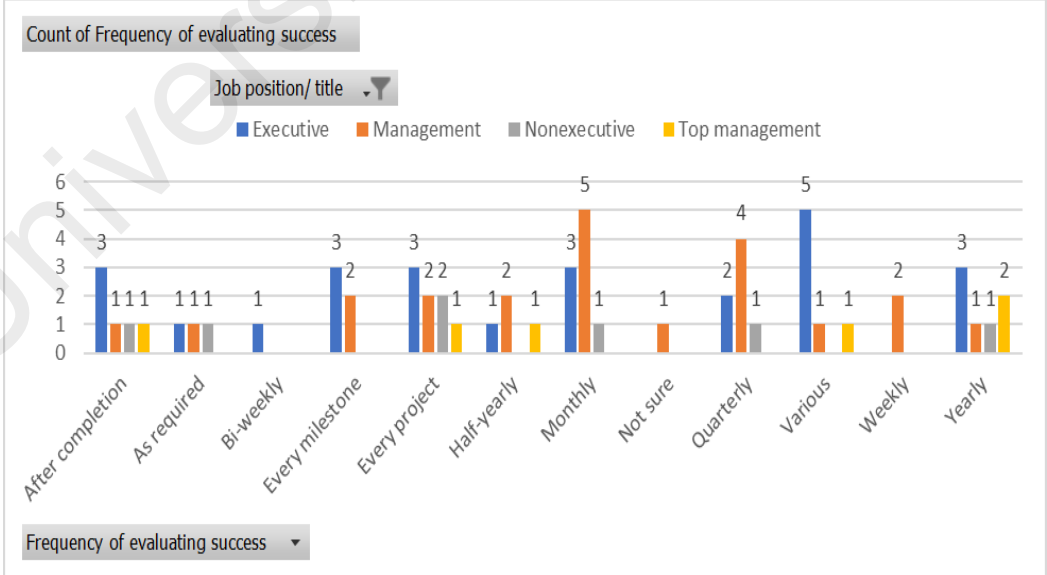
4.2.7 Frequency of success management activities

The respondents mentioned various frequencies as shown in Figure 4.9 below. The breakdown of the frequencies mentioned are as follows:

- Weekly (2), biweekly (1), monthly (9) and quarterly (7)
- Half-yearly (4) and yearly (9)
- After completion (6), every milestone (5) and every project (8)
- As required (3), various (7) and not sure (1)
- During operations (none)
- Total (60)

It can be observed that the frequencies mentioned are all for the periods during and after project completion, and none mentioned for the operations or production period which is the longest during any asset life cycle.

Figure 4.9 Frequencies of success management activities mentioned by respondents



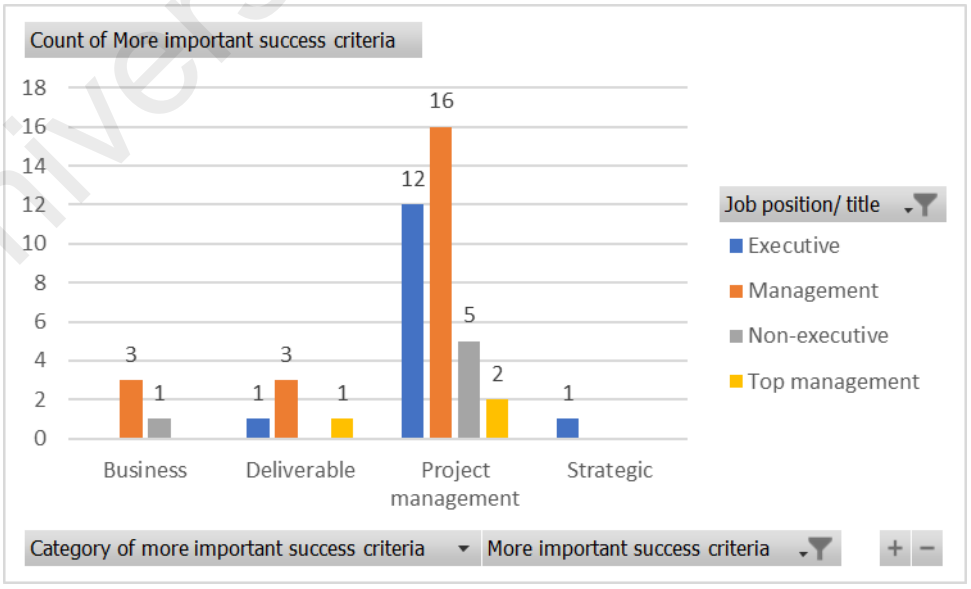
4.2.8 More important success criteria

The respondents mentioned the keywords that represent the success criteria that they think are more important than others, thus they effectively rank the relative importance of the success criteria. The keywords mentioned were identified and classified into the categories of success criteria as shown in Figure 4.10 below. The breakdown of the relative important or ranking of the success criteria in a descending order is as follows:

- project management (35)
- Deliverable (5)
- Business (4)
- Strategic (1)
- Process (0)
- Total (45)

Thus, the more important success criteria is by far project management (35).

Figure 4.10 More important success criteria ranked by respondents



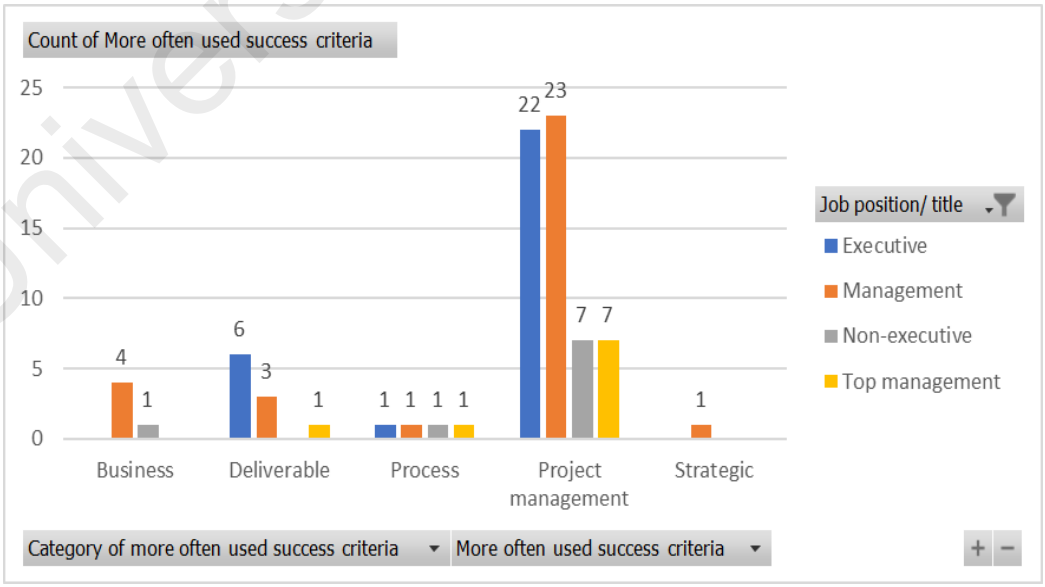
4.2.9 More frequently used success criteria

The respondents were asked to identify which success criteria were more frequently used in their practice. The keywords that represent the more frequently used success criteria mentioned by the respondents were identified and classified into categories of the success criteria as depicted in Figure 4. 11 below. The breakdown of the categories of the more often used success criteria in a descending order is as follows:

- project management (59)
- Deliverable (10)
- Business (5)
- Process (4)
- Strategic (1)
- Total (79)

Hence, the more often used success criteria is glaringly project management (59).

Figure 4.11 More often used success criteria by respondents



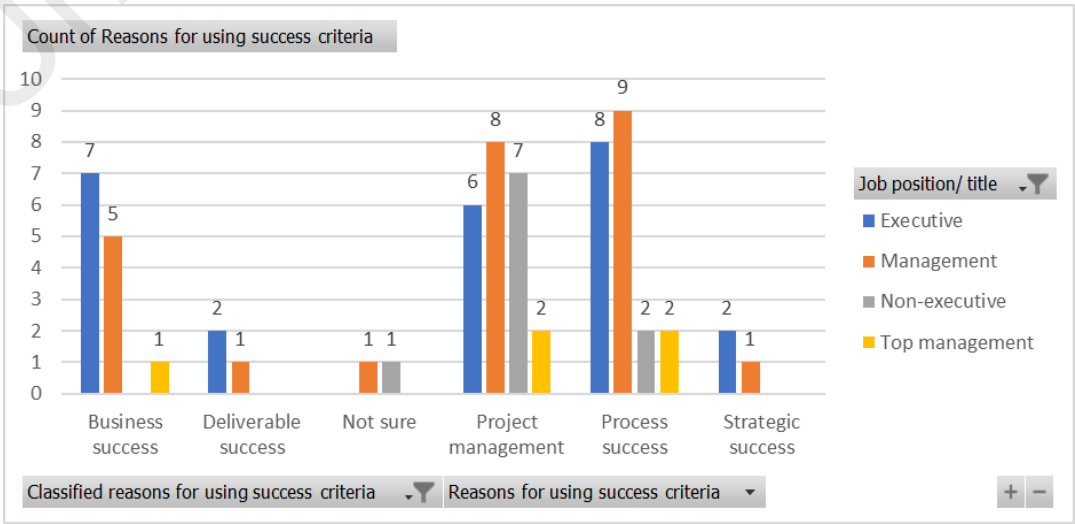
4.2.10 Rational for success management

When asked the reasons for using success criteria, the respondents mentioned keywords which were identified and classified into categories that match the success levels and criteria in the conceptual framework as depicted in Figure 4.12 below. The breakdown of the reasons mentioned after classified into categories of success levels and criteria is as follows:

- project management (23)
- Process (21)
- Business (13)
- Deliverable (3)
- Strategic (3)
- Not sure (2)
- Total (65)

It can be noted that most respondents think the reasons for using success criteria for project management, process and business successes (57) and not quite for deliverable and strategic successes (6).

Figure 4.12 Reasons for using success criteria by respondents



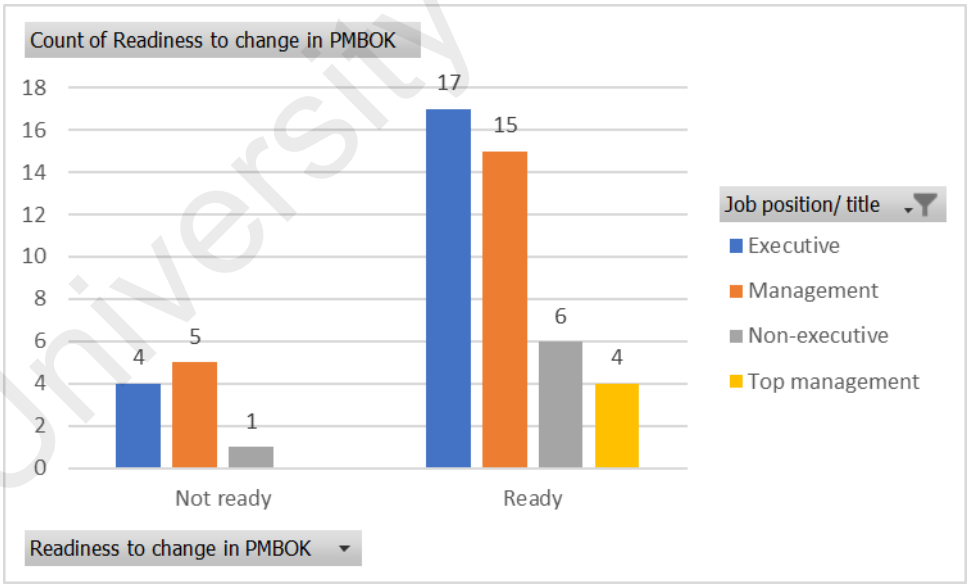
4.2.11 Readiness to change in project management standard

When asked how their organizations will adapt the success criteria when responding to the proposed change in project management body of knowledge and standard from process-based and knowledge areas to principle-focused and performance domains, the respondents mentioned keywords to indicate how their organizations will adapt to the impending change. These keywords were identified and classified into two categories i.e. whether ready or not ready to embrace the change as shown in Figure 4.13 below. The breakdown of the readiness to the change is as follows:

- Ready (42) vs Not ready (10).

This indicates that most respondents think that their organizations are more ready to embrace the incoming change than not ready.

Figure 4.13 Readiness to change in project management standard



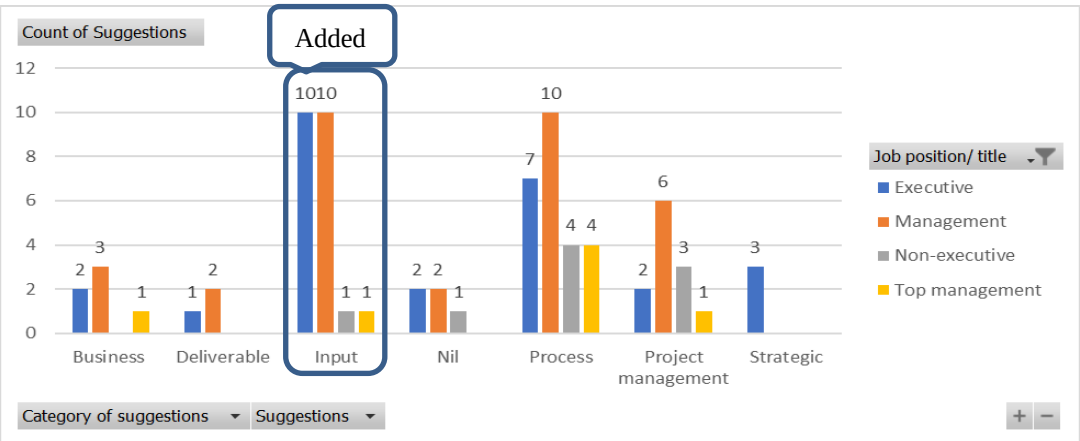
4.2.12 Suggestions for improving project success management

When asked for any suggestions for improving success of project, program and portfolio management within their organizations, the respondents mentioned keywords in their suggestions. The keywords mentioned were identified and classified into categories of the success levels and criteria as shown in Figure 4.14 below. The breakdown of the suggestions according the success levels and criteria in a descending order is as follows:

- Process (25)
- Input (22)
- Project management (12)
- Business (6)
- Deliverable (3)
- Strategic (3)
- Nil (5)
- Total (75)

It can be noted that the respondents suggested for process improvement and provision of adequate resources with the right competency which represents the input level before the process or project can commence.

Figure 4.14 Suggestions for improving project success management by respondents



CHAPTER 5: DISCUSSION

The findings of the research are summarized, triangulated and interpreted before recommendations are put forward in this chapter.

5.1 Overall research results

The overall research findings and whole research output are summarized into the enhanced project success framework as shown in Figure 5.1 below.

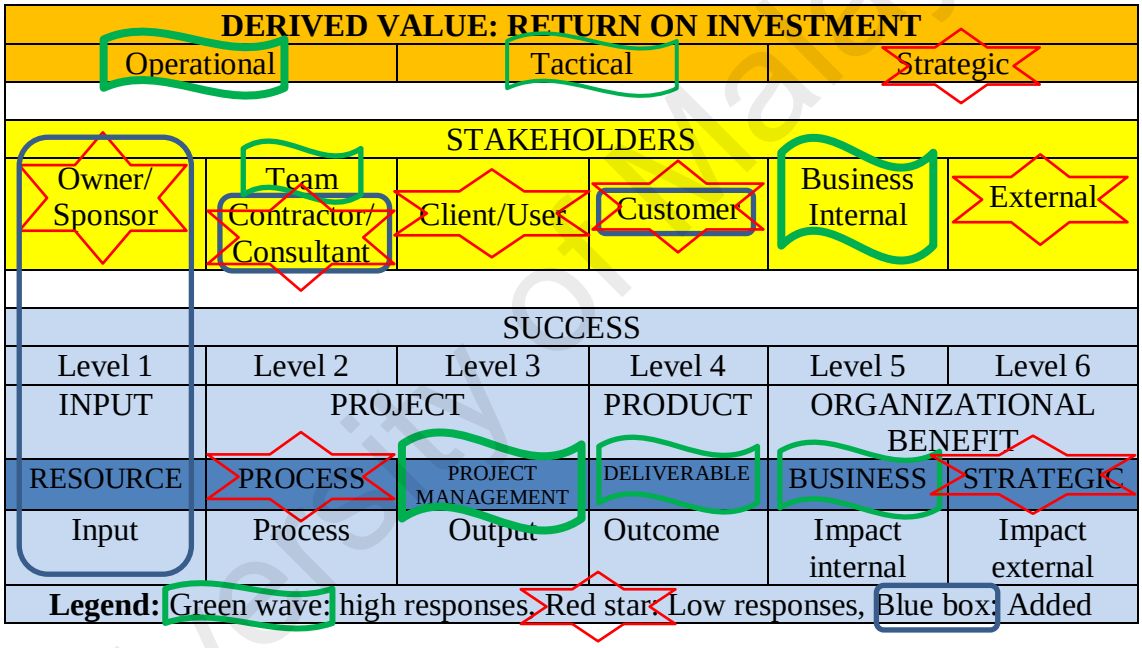


Figure 5.1 Enhanced multilevel project success framework

The key findings of this research are listed as follows:

1. The six success levels and criteria proposed in the conceptual framework are supported by the findings of this research.
2. The addition of the input success level along with several missing stakeholders and the operational value into the conceptual framework are supported by the findings of this research.

3. The research findings reveal several gaps existing in the use of the framework whereby the respondents focus very heavily on the project management success rather than on the subsequent product success.
4. The respondents were also found to be focusing on business internal stakeholders and project management team (77 keywords) much more than the client, user and customer, owner and sponsor, contractor and consultants and external stakeholders (all combined 19).
5. The respondents focus more on providing operational value (40 keywords) followed by tactical value (20) and then business and strategic value (30).

The key findings of each question in the questionnaire survey are discussed, triangulated and interpreted next.

5.2 Findings on the project success continuum

There are six levels and criteria of project success found in this research i.e. process success, project management success, deliverable success, business success and strategic success and input success. The input success was added into the conceptual framework and supported by the findings from question 3.6 whereby many respondents (22) mentioned the need for provision of adequate resources with the right competency as one of the suggestions for improving project success management. The need for addition of this input level into the project success framework is supported by previous research by Welde (2018), Volden (2018) and Zidane Johansen & Ekambaram (2015). Its inclusion enables the indicators for value for money namely economy, efficiency, effectiveness, relevance and sustainability to be estimated during the definition, appraisal and evaluation of project success management. The weakness of the Bannerman (2008) was identified as the lack of the input level in the conceptual framework and this has been rectified by the finding of this research.

Most respondents focus heavily on the project management success followed by deliverable and business successes and less on process and strategic successes. This finding can be seen from the number of occurrences of the keywords mentioned for each success levels and criteria as well as the success indicators as tabulated in Table 5.1 below. This indicates that there is a gap in the use of the project success framework and an imbalanced attention or skewed view of the respondents on the six success levels and criteria. This finding also indicates that the respondents has a short-term view instead of a long-term view of project success. The gap and imbalanced attention combined can become weaknesses if not corrected because the successes at the project management and deliverable levels do not guarantee the successes at the business and strategic levels (de Wit, 1988). In contrast, while there are failures at the project management and process levels, there can still be success at the deliverable, business and strategic level. The Sydney Opera House project has been cited repeated by literature as a classic example of a product success after a project failure. One notable observation is that the low responses for the process success which can imply that the respondents do not use any processes and procedures or there is a lack of use of these in practice. The keywords for the high responses (25) for process success to question 3.6 suggest that the respondents focus heavily on continuous improvement of processes and procedures. Thus, it is recommended to close the gap in the use of project success levels in the organizations of the respondents and to balance up the skewed view of project success management, perhaps through further training and development.

Table 5.1 Number of keywords for success criteria and indicators

Success	Level 1 Input	Level 2 Process	Level 3 PM	Level 4 Deliverable	Level 5 Business	Level 6 Strategic
Number of keywords for success levels and criteria	22	5	**68**	**31**	15	7
Number of keywords for success indicators	22	5	**62**	**27**	11	4

5.3 Findings on the stakeholder continuum

There are several stakeholders added to the stakeholder continuum in the conceptual project success framework i.e. the owner and sponsor, contractor and consultant and customer. The findings from question 2.5 show that most respondents focus heavily on internal stakeholders, team and project management (77) and very less on the client, user and customer (5), contractor and consultant (5), owner and sponsor (6), and external stakeholders (3). Surprisingly, the respondents do not mention the client, user and customer as their main stakeholders, instead they prioritize the business internal stakeholders as the most mentioned stakeholders in the responses followed by the project management team. This appears to imply that the respondents focus on satisfying their superiors and colleagues and not the client, user and customer. This imbalance in the responses indicates that the respondents engage much more with their internal stakeholders than external stakeholders. This also means they focus more on the direct and close stakeholders and less on indirect stakeholders. This imbalanced stakeholder engagement can cause ineffective project stakeholder management. Davis (2017) contended for consideration of the perspectives of multiple stakeholder groups and shared use of success dimensions for a given project as opposed to a selected few to define project success to enable informed managerial decision making for minimizing major

financial losses. Thus, it is recommended to rectify this gap and weakness in stakeholder engagement through training and development by first creating awareness of the existence of this issue.

5.4 Findings on the value continuum

The findings on the derived value continuum show that the respondents focus more on project management success (40 keywords) but zero keywords for process success at the operational level, deliverable success (20 keywords) at the tactical level and business success (15 keywords) and strategic success (also 15 keywords) at the strategic level. There is a descending trend in the number of the relevant keywords mentioned from project management to deliverable, business and strategic successes. This implies that the respondents emphasize much more on project management success than business and strategic success. These findings indicate that there is a bifurcation between project management and deliverable successes which are achievable over the short-term and the business and strategic successes which are only accomplished over the long-term. These findings are in line with Volden (2018) who found that majority of projects were successful, especially in operational terms and argued for using a standardized framework which provides a good basis for comparison and learning across sectors. Welde (2018) also calls for the use of a goal-oriented framework for ex-ante evaluation of project success based on life cycle. The imbalanced focus and the bifurcation of the value continuum can be destructive to the organization performance of the respondents over the long term because the respondents can merely work for project management success by meeting the iron triangle without caring about whether the deliverable contributes any economic value added to the value chain of their organizations. Projects, programs and portfolios when carried out should create value (Graham & Cohen, 2001) and provide strategic alignment to the organization (Morris, 2004) for achieving competitive advantage and continuity (Porter, 1985).

5.5 Findings on frequencies of project success management activities

The respondents mentioned only frequencies of project success management activities from the project start and after completion without any frequencies mentioned to assess the project's deliverable success during the operations phase. Furthermore, the respondents considered project management as the more important and more often used success criteria. These findings indicate the respondents have a short-term view of project success without much of the long-term view. The heavy focus on project management success over the short-term, if left unchecked, can lead to the status quo of low project success rates despite attempts and efforts to improve these since the modern project management became a discipline in 1960s. This is simply because those who are involved and participate in projects, programs and portfolios are themselves the cause of the problem by focusing on project management success instead of the product success. After all, project efficiency (management) correlates moderately strongly to overall project success i.e. correlation of 0.6 and R2 of 0.36 as per Serrador & Turner (2015).

5.6 Findings on rational for using project success criteria

The respondents mentioned more keywords related to project management and process successes (combined 44) than for business, deliverable and strategic successes (combined 19). As highlighted above, this heavy focus on project management and process successes does not guarantee the success of the project's product, service or result (de Wit, 1988; Serrador & Turner, 2015)). Serrador & Turner (2015) shows that project efficiency correlates moderately strongly to overall project success (correlation of 0.6 and R2 of 0.36). So, the respondents need to be notified of the disadvantage of the heavy focus on project management which should not jeopardize the subsequent product success. This gap can be rectified perhaps through awareness creation, training and development. However, there is a glimpse of hope as the respondents has indicated their organizations' readiness to embrace the change particularly on the proposed change of the project

management body of knowledge and standard from process-based and knowledge areas to principle-focused and performance domains respectively. The two leading project management bodies i.e. PMI and APM appear to remain following organizations in terms of practices compared to new bodies such as Praxis (2014) and GPM (2018).

5.7 Recommendations for improving project success management

There are three recommendations for improving project success management: to agree on a standardized and holistic project success framework, to adopt and agree on the enhanced project success framework and to integrate the bifurcated project success levels into a life cycle success management strategy and also the various standards of project, program, portfolio, portfolio, organizational maturity and competence management into one standard.

5.7.1 To agree on a standardized and holistic project success framework

It is recommended to organizations to agree on and adopt the enhanced project success framework complete with six success levels and criteria which form the project success continuum which is in turn integrated with the stakeholders and derived value continuums. The six success levels can be considered as a minimum standard project success assessment and can be adapted or increased to cater for project complexity which necessitates organizational change management for the transition from the output to outcome level. Hopefully, what gets measured, gets managed. (Drucker, 1954).

It is further recommended that the enhanced project success framework be used along with its rules of use as have been outlined by Bannerman (2008, 2012) whereby project success is determined by the highest level of success deemed accomplished by the project. There are basically three scenarios of project success i.e. 1) the dominant one is where a project fails at the lower levels of success but succeeds at the higher levels and thus considered a lucky case; 2) a project that succeeds at the lower levels but fails at the higher

levels, which means a rather non-beneficial scenario and 3) a project that succeeds at all levels which is a rare case and thus the ultimate challenge for organizations to accomplish. A classic example of the first scenario is the Sydney Opera House project which failed at the lower level of project management success but it succeeds very well at the business and strategic levels (generating good tourism and providing distinctive national image for Australia) and now, after so many years in operations, it starts to show limitations which are indeed failure at the deliverable success level due to its small size and its main stage is built in a pit. The second scenario is where a project achieves both project management and deliverable successes but not the business and strategic successes. This means the project meets the iron triangle but suffers shortfalls of benefits. There are some examples of this scenario as highlighted by Flyvbjerg (2017). The best scenario is of course where a project succeeds at both lower and higher levels which means success throughout the asset life cycle from cradle to cradle. This best-case scenario is the quest for management of projects, programs, portfolios and organizations to achieve performance excellence.

5.7.2 To adopt and adapt the enhanced project success framework

This research has provided some empirical evidence for the enhanced project success framework, within the limitations of the research of course. The six success levels and criteria of the framework offers an adequate success levels for assessment of project success by organizations at any stages of the asset life cycle and have been reasonably supported to exist by the research findings and used by the respondents. This indicates that the relevance, completeness of its criteria and practical utility of the enhanced framework. Of course, further research in the future shall provide more empirical evidence with respect to this matter. The use of the enhanced framework shall enable the basic Plan, Do, Check and Act cycle for project success management within organizations. (Deming, 2000)

5.7.3 To integrate the bifurcated project success levels into a life cycle success management strategy

The research findings indicate the respondents focus much more heavily on project management and deliverable successes than the business and strategic levels, resulting in a bifurcation between them. This is not surprising as the standards of project, program and portfolio managements of the large project management bodies like PMI PMBOK Guide (2017) and APM BoK (2019) is also bifurcated into silos, requiring mapping by users and organizations. Hence, it is recommended to integrate and treat the six success levels along a continuum based on the theory of change framework and the life cycle perspective as already championed by UNDP (2012), DIFD (2013), Praxis (2014) and GPM P5 (2020) respectively. Project personnel and organizations in various sectors can also proactively initiatives this integration. This integrated approach is expected to enable project success management activities from defining, appraisal to evaluation to be carried out throughout the life cycle of the asset, be this a product, service or result, and avoid any possible breakdowns when transitioning from the project phase to the product phase to reap benefits and impact as contended by Meredith & Zwikael (2020).

Since the enhanced framework covers the full life cycle of an asset or product with three parallel continuums for success, stakeholders and derived value, it might be fitting to rename it as the holistic life cycle success framework which can be applied to success management of asset, product or service over their respective life span. Varajao & Trigo (2016) proposed to add success management as one of the knowledge areas in PMI PMBOK Guide (2017). This life cycle perspective is required to optimize the benefit to cost ratio of the asset, product or service over their life span. The integration is expected to enable project contribution to the economic value added (Graham & Cohen, 2001) and strategic alignment along the organizational hierarchy (Morris, 2004; Dash, 2016).

Hopefully, these contribute to the value chain of the organization and sustained competitive advantage as contended by Porter (1985).

In addition, the integration requires a pre-requisite fundamental shift in how one defines what is 'project'. Many professional bodies define a project as the implementation/execution stage. This limited definition is driven by the fact that most people work in this stage. However, project owners have a much wider view on the project – what Morris (1994) called 'Management of Projects versus the conventional project management. Those project personnel who work for project owner organizations are brought up to define projects more holistically, and benefits management is simply considered part and parcel of their professional occupation. Likewise, the formwork as developed by Bannerman (2008) is regarded as quite normal. The iron triangle of time, cost and scope can be only defined more accurately mid-way through a project, prior to execution. Researchers like Merrow (2011 & 2012) have shown measuring these which are made visible during execution is not necessarily a measure of how well a project is executed, because it is influenced by the earlier project stages of initiation and development. This compartmentalization of projects (i.e. separating the success levels and the subject domains) becomes one of the root causes of frustration with results, and until an owner's more holistic view on managing projects and their deliverables is taken, not much will change from the current status quo of dismal project success rates.

Project performance and success can be significantly better than the current norms. Most personnel on projects are trying their best to apply methods that are bifurcated and flawed, and often forced on them by project owners who believe these are the right thing to do. Given the wide variation of the dismal performance (about 25 to 62% of project success rates) and its constancy over time, and the fact that more efforts on behalf of project personnel has almost no sustainable impact so far, perhaps the problem lies on the

method or system being used (Deming, 2000). Following the guidance by PMI (2017), APM (2019) and PRINCE2 (2017) is better than nothing but this does not guarantee much of success and excellence either. That is why currently there is so much reliance on the project leader. A better system should help average project personnel deliver good enough results constantly that is still elusive so far. Therefore, project personnel should be driven by benefits and value gained from project results. On time, on budget and on scope is a failure of project management if no benefits and value are achieved.

CHAPTER 6: CONCLUSION

This research has been triggered by the dismal project success rates in various sectors as reported by the numerous reports as listed in Table 1.1 in Chapter 1. Subsequently, three key problems were identified from the literature review i.e. no agreement on a standardized and holistic multilevel project success framework, not much empirical evidence for the use of a multilevel project success framework which is in the most advanced form among those reviewed and bifurcation of the project success definition and the related domains of project, program, portfolio, benefits, organizational maturity and competence management into various standards which results in separation of project management and project successes from the subsequent outcome and impact successes in practice. Therefore, this research has focused on investigating the use of the multilevel project success framework as a contribution to improve the challenge of the dismal project success rates in various sectors. Below, the achievement of the research aim and objectives, the limitations of this research and recommendations for future research are presented. The research conducted manages to achieve its aim and objectives as elaborated below.

6.1 Achievement of aim

The research aim is to investigate the use of a multilevel project success framework by identifying the success levels and criteria and determining any weaknesses of the framework and gaps in its use for enhancing it to be holistic and fit for use by project personnel. During the course of the research, a conceptual project success framework was developed with proposed enhancements to rectify the determined weaknesses based on the literature review of various project success frameworks. Subsequently, the conceptual framework was used to develop the questionnaire survey questions to determine any gaps its use among project personnel and to test the relevance and completeness of its success

levels and criteria and its practical utility. The findings of the research confirm that the relevance and usefulness of the multilevel framework along with its three parallel continuums namely success, stakeholders and value which were found to be supported by the collected and analyzed data from the questionnaire survey although to varying degrees. Hence, the project success framework is enhanced accordingly as per the conceptual framework.

6.1.1 Achievement of objective 1

The first objective is to identify the essential success levels and criteria of the multilevel project success framework by Bannerman (2008) which appears to be the most advanced form among those frameworks reviewed. The original framework has three continuums of success, stakeholders and derived value with success continuum having five success levels and criteria. The literature review identifies that the success continuum of the original framework lacks one level at its beginning which is the input level to enable estimation of indicators of value for money, making a total of six success levels and criteria in the conceptual framework. The input level is required for provision of adequate and competent resources and/or services required for the successful and satisfactory delivery of the project, program and portfolio. The six success levels are called the Input, Process, Project Management, Deliverable, Business and Strategic successes respectively. The existence of these six levels and criteria of project success are supported by the findings of the literature review and research results from the questionnaire survey.

6.1.2 Achievement of objective 2

The second objective of the research is to determine any weaknesses of the multilevel project success framework and any gaps in its use among project personnel. This research determines that there are several weaknesses of the original framework by Bannerman (2008) i.e. it has no input level in its success continuum which disable the estimation of

indicators of value for money such as the economy, efficiency, effectiveness and cost-effectiveness (UNDP, 2012 and DFID, 2013). The stakeholders' continuum misses several crucial stakeholders namely the customer, owner and sponsor, contractor and consultant. The value continuum has strategic and tactical values but not the operational value. Furthermore, the research reveals several gaps in the use of the multilevel framework by the respondents i.e. 1) they focus much more heavily on the project management and project successes than on the subsequent deliverable, business and strategic successes, 2) they engage much more on business internal stakeholders, project team and project management than the client, user and customer, the contractor and consultant, the owner and sponsor and the external stakeholders and 3) they concentrate on contributing operational value much more than tactical, business and strategic values. These imbalanced focusses, if not rectified as recommended earlier, may lead to suboptimal project performance and contribution to the economic value added and strategic alignment of the overall organization strategy.

6.1.3 Achievement of objective 3

The third objective of the research is to enhance the multilevel project success framework to be holistic and fit for use. The weaknesses of the original framework have been rectified by several enhancements i.e. by adding the input level, the missing stakeholders and left out operational value into the success, stakeholders and value continuums respectively. Literature review reveals the need for adding the input level as practiced by UNDP (2012) and DFID (2013) to enable estimation of indicators of value for money i.e. economy, efficiency, effectiveness and cost-effectiveness. Thus, the input level is added into the conceptual framework along with the corresponding stakeholders i.e. the owner or sponsor and customer in addition to the client or user. Subsequently, past researches notably by Welde (2018), Volden (2018) and Zidane Johansen & Ekambaram (2015) show that the input level was included in their project success frameworks, again

to enable the estimation of indicators for value for money which were slightly enhanced to economy, efficiency, effectiveness, relevance and sustainability as well as to consider the full life cycle perspective. In addition, they include an operational value level in their frameworks, so this is added into the value continuum of the conceptual framework of this research. Hence, the multilevel project success framework by Bannerman (2008) is enhanced by adding the input success level into the success continuum, the stakeholders of the owner or sponsor and customer into the stakeholder continuum, and the operational value into the value continuum. These additions enhance the project success framework to make it more holistic and fit for use by project personnel in various sectors. These additions in the conceptual framework are proposed based on literature review and supported by the findings of this research. Hence, the enhanced framework consists of a success continuum with six levels and criteria, a multi-stakeholder continuum and a derived value continuum which shows the relevance and completeness of its criteria and its practical utility among the project personnel surveyed.

6.2 Research contribution

This research is triggered by the dismal project success rates in various sectors as reported by numerous reports. The dismal project success rates present a challenge to those who participate and are involved in projects, programs and portfolios within organizations, those in academia and research and the project professional bodies. Among others, one of the proposed cures is to use a multilevel project success framework for assessment of project success. The justification for the multilevel project success framework is clarified as follows: In order to define project success holistically and to standardize its definition, the framework needs to have three parallel continuums namely project success as the bottom layer, stakeholders as the middle layer and derived value as the top layer. The enhanced success continuum is multilevel i.e. divided into six levels called input, process, output, outcome and impact to cover not only the short-term project

life cycle but also the ensuing long-term product life cycle. The six success levels and criteria enable the planning, appraisal and evaluation (i.e. management) of success at each key stage of the project-product life cycle. These six levels also correspond with the respective stakeholders on the middle continuum, whose needs and expectations to be fulfilled and satisfied by the project and product to determine whether the project is successful or not. Furthermore, the six success levels can be used to assess the value added from the project, program and portfolio by the organization. The multilevel success framework enables the cascading and strategic alignment of the organizational strategy with the strategies of project, program, portfolio, team and individual levels.

6.3 Limitation of research

One limitation of this research is the snowballing sampling method which was carried out due to no direct access to organizations to administer the questionnaire survey because of the movement control period (MCO) period of the Covid-19 pandemic. The snowballing was started using personal contacts in the oil and gas industry who did suggest some referrals as respondents, including from other sectors who also participate or are involved in projects, programs and portfolios within their respective organizations.

6.4 Recommendation for future research

In view of the research limitation, it is suggested to repeat this research in sectors or organizations, using the enhanced holistic project success framework and perhaps an objective questionnaire survey with Likert scale so that statistical analysis can be carried out and correlations can be established.

REFERENCES

Adabre, M. A., & Chan, A. P. (2019). The ends required to justify the means for sustainable affordable housing: A review on critical success criteria. *Sustainable Development*, *27*(4), 781-794.

Akal, A., Abu El-Maaty, A., & El-Hamrawy, S. (2016). A circular framework for evaluating highway construction projects success: AHP approach. *Civil Engineering Journal*, *2*(7), 324-333.

Ahmadabadi, A. A., & Heravi, G. (2019). Risk assessment framework of PPP-megaprojects focusing on risk interaction and project success. *Transportation Research Part A: Policy and Practice*, *124*, 169-188.

Al-Tmeemy, S. M. H. M., Abdul-Rahman, H., & Harun, Z. (2011). *Future criteria for success of building projects in Malaysia. International Journal of Project Management, 29(3), 337–348.* doi:10.1016/j.ijproman.2010.03.003

APM UK (2019), What is benefits management and project success? At https://www.apm.org.uk/resources/what-is-project-management/what-is-benefits-management-and-project-success/ (Accessed 5/6/2020)

Altheide, D. L. (1997). The news media, the problem frame, and the production of fear. *The sociological quarterly*, *38*(4), 647-668.

Arcidiacono, G. (2017). Comparative research about high failure rate of IT projects and opportunities to improve. PM World Journal Vol. VI, Issue II – February 2017. Retrieved at https://pmworldlibrary.net/wp-content/uploads/2017/02/pmwj55-Feb2017-Arcidiacono-high-failure-rate-of-it-projects-featured-paper.pdf (Accessed on 25/06/2020)

Ashley, D. B. (1986). 'New trends in risk management' Internet's 10th Int. Expert Seminar on 'New Approaches in Project Management', Zurich (March l&12, 1986).

Ashley, D B, Lurie, C S and Jaselskis, E J. (1987). Determination of construction project success. *Proj. Manage. J.* Vol XVIII No 2 (June 1987)

Atkinson, R. 1999. Project management: cost, time and quality, two best guesses and a phenomenon, it's time to accept other success criteria. International Journal of Project Management.,17(6):337-42.

Avots, I. 1969. Why does project management fail? California Management Review Fall:77-82.

Adzmi, R. M., & Hassan, Z. (2018). A theoretical framework of critical success factors on information technology project management during project planning. *International Journal of Engineering and Technology (UAE)*, *7*(4), 650-655.

Badewi, A., & Shehab, E. (2016). The impact of organizational project benefits management governance on ERP project success: Neo-institutional theory perspective. *International Journal of Project Management*, *34*(3), 412-428.

Baccarini, D. 1999. The logical framework method for defining project success. Project Management Journal. 30(4): 25-32.

Baker, B N, Murphy, D C and Fisher, D. (1983). Factors affecting project success in Clelland and King (Eds) *Project management handbook.* Van Nostrand Reinhold, USA.

Bannerman, P. L. (2008). Defining project success: a multilevel framework. Paper presented at PMI® Research Conference: Defining the Future of Project Management, Warsaw, Poland. Newtown Square, PA: Project Management Institute.

Barnes, M. (2007). Some Origins of Modern Project Management: A Personal History *PM World Today* Vol. II, Issue XI – November 2007, www.pmworldjournal.net by Martin Barnes

Barros, L., & Ribeiro, P. (2018, March). Characterization of an Evaluation Success Model of an IS Project, Focused on Stakeholders. In *World Conference on Information Systems and Technologies* (pp. 897-904). Springer, Cham.

Beng, Q. T., Kamran, S., & Hamzah, A. R. (2019). Deepwater Oil and Gas Project Performance: A Study of Cultural Intelligence. *Innovative Production And Construction: Transforming Construction Through Emerging Technologies*, 405.

Belassi, W. and Tukel, O.I. 1996. A new framework for determining critical success/failure factors in Projects. International Journal of Project Management 14(3):141-51.

Breese, R., Couch, O., & Turner, D. (2020). The project sponsor role and benefits realisation: More than 'just doing the day job'. *International Journal of Project Management*, *38*(1), 17-26.

Biddulph, S., Manu, P., Dziekoński, K., Mahamadu, A. M., Aigbavboa, C., & Lee, S. (2018). The effect of project success factors on project success criteria.

Bigbee, J. A. S., & Stevenson, D. H. (2019). IT Project Communication: An Investigation of Its Dimensions and Relationship to Project Success. *International Journal of Information Technology Project Management (IJITPM)*, *10*(3), 56-72.

Bryde, D. J., Unterhitzenberger, C., & Joby, R. (2019). Resolving agency issues in client–contractor relationships to deliver project success. *Production Planning & Control*, *30*(13), 1049-1063.

Camilleri, E. (2011). *Project success: critical factors and behaviours*. Routledge.

Castro, M. S., Bahli, B., Farias Filho, J. R., & Barcaui, A. (2019). A contemporary vision of project success criteria. *Brazilian Journal of Operations & Production Management*, *16*(1), 66-77.

Center for Theory of Change (2019). How does the theory of change works? Available at https://www.theoryofchange.org/what-is-theory-of-change/how-does-theory-of-change-work/ (Accessed on 8/12/2019)

CHAOS report (2015). The CHAOS report 2015. The Standish Group. Retrieved from https://www.infoq.com/articles/standish-chaos-2015 (Accessed on 13/11/2019)

Chan, A. P., & Adabre, M. A. (2019). Bridging the gap between sustainable housing and affordable housing: The required critical success criteria (CSC). *Building and Environment*, *151*, 112-125.

Chan, A. P., Scott, D., & Lam, E. W. (2002). Framework of success criteria for design/build projects. *Journal of management in engineering*, *18*(3), 120-128.

Chan, A. (2004), "Factors Affecting the Success of a Construction Project", *J. Constr. Eng. Manage.*, Vol. 130 No. 1, p. 153-155

Chan, A. P., & Chan, A. P. (2004). Key performance indicators for measuring construction success. *Benchmarking: an international journal*, *11*(2), 203-221.

Cooke-Davies, T.J. (2002), The "real" success factors on projects, International Journal of Project Management, 20:185-190.

Cooke-Davies, T. J. (2004). Consistently doing the right projects and doing them right–What metrics do you need. *The measured*, *4*(2), 44-52.

Cooper, R. G. (2019). The drivers of success in new-product development. *Industrial Marketing Management*, *76*, 36-47.

Covey, S.R (1989). The 7 Habits of Highly Effective People (1989, 2004) (ISBN 0-671-70863-5)

Crawford L, Pollack J. 2004. Hard and soft projects: a framework for analysis. International Journal of Project Management 2004;22(8): 645–53.

Dash, S. N. (2016), PMP Prep: Strategic Alignment of Projects, March 8, 2016, https://www.mpug.com/articles/pmp-prep-strategic-alignment-of-projects/ (Accessed on 10/11/2019)

Davis, K. (2017). An empirical investigation into different stakeholder groups perception of project success. *International Journal of Project Management*, *35*(4), 604-617.

Deane R.H. Clark, T.B. Young, A.P. (1997), Creating a learning project environment: aligning project outcomes with customer needs, Information Systems Management 1997, 54-60.

Deloitte (2018). Improving capability and performance across the capital project lifecycle. Deloitte Capital Projects. Retrieved at https://www2.deloitte.com/content/dam/Deloitte/au/Documents/infrastructure-capital-projects/deloitte-au-icp-improving-capability-performance-capital-project-lifecycle-180718.pdf (accessed on 25/06/2020)

Derakhshan, R., Turner, R., & Mancini, M. (2019). Project governance and stakeholders: a literature review. *International Journal of Project Management*, *37*(1), 98-116.

Demirkesen, S., & Bayhan, H. G. (2020). A Lean Implementation Success Model for the Construction Industry. *Engineering Management Journal*, 1-21.

Deming, W. E. (2000). Out of the crisis (1. MIT Press ed.). Cambridge, Mass.: MIT Press. p. 88. ISBN 0262541157.

De Wit, A. (1985). 'Cost effective owner project management - the challenge for the future' *Proc. 8th World Congress on Project Management* Rotterdam (May 19-24, 1985) pp 444-452.

De Wit, A. 1988. Measurement of project success, International Journal of Project Management, 6(3):164-170.

Doan, T. T. T., Nguyen, L. C. T., & Nguyen, T. D. N. (2020). Emotional Intelligence and Project Success: The Roles of Transformational Leadership and Organizational Commitment. *The Journal of Asian Finance, Economics, and Business*, *7*(3), 223-233.

Drucker, P.F. (1954). *The Practice of Management* (New York: Harper & Brothers).

EFQM (2003). EFQM Excellence Model. European Foundation for Quality Management, Brussels

Elbaz, A. E. M. and Spang, K. 2018. Mapping the success dimensions of the infrastructure projects in Germany. International Project Management Association Research Conference 2017, UTS ePRESS, Sydney: NSW, pp. 1-13. https:// doi.org/10.5130/pmrp. ipmarc2017.5616

Elbaz, A., & Spang, K. (2020). Concept to Enhance the Project Success and Promote the Implementation of Success Factors in Infrastructure Projects. *International Journal of Urban and Civil Engineering*, *14*(4), 126-134.

Engwall, M., & Jerbrant, A. (2003). The resource allocation syndrome: the prime challenge of multi-project management? *International journal of project management*, *21*(6), 403-409.

Ernst and Young (2017). Oil and gas megaproject development. Oil and Gas Capital Series. Retrieved from https://www.ey.com/Publication/vwLUAssets/ey-oil-and-gas-megaproject-project-development-to-fid/$FILE/ey-oil-and-gas-megaproject-project-development-to-fid.pdf (Accessed on 13/11/2019)

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of Convenience Sampling and Purposive. American Journal of Theoretical and Applied Statistics, 5(1), 1-4. doi:10.11648/j.ajtas.20160501.11

Farokhad, M. R., Otegi-Olaso, J. R., Pinilla, L. S., Gandarias, N. T., & de Lacalle, L. N. L. (2019, September). Assessing the Success of R&D Projects and Innovation Projects through Project Management Life Cycle. In *2019 10th IEEE International Conference on Intelligent Data Acquisition and Advanced*

Computing Systems: Technology and Applications (IDAACS) (Vol. 2, pp. 1104-1110). IEEE.

Fortune, J., & White, D. (2006). Framing of project critical success factors by a systems model. *International journal of project management*, *24*(1), 53-65.

Flyvbjerg, B. (Ed.). (2017). *The Oxford handbook of megaproject management*. Oxford University Press.

Fraser, D. (1984), An approach to major projects, Major Projects Association, Oxford (1984) pp. 11-12

Freeman, M., & Beale, P. (1992). Measuring project Success. Project Management Journal, 23 (1), 8-17.

Graham, R. J. & Cohen, D. J. (2001). Beyond the triple constraints: developing a business venture approach to project management. Paper presented at Project Management Institute Annual Seminars & Symposium, Nashville, TN. Newtown Square, PA: Project Management Institute.

Gentles, S. J., Charles, C., Ploeg, J., & McKibbon, K. A. (2015). Sampling in Qualitative Research: Insights from an Overview of the Methods Literature. 20(11), pp. 1772-1789. Retrieved from nsuworks.nova.edu/tqr/vol20/iss11/5

Gemunden, H.G., Salomo, S. and Krieger, A. (2005), The influence of project autonomy on project success. International Journal of Project Management, Vol. 235, pp. 366-73.

GPM (2020). The GPM P5 Standard for Sustainability in Project Management v2.0. GPM Global. Retrieved at https://greenprojectmanagement.org/the-p5-standard (on 19/06/2020)

Gross, B., & Wehnes, H. (2015). The Project Excellence Model revised. Conference: IPMA 29th World Congress, 28–30 September 2015, Panama.

Hadzaman, N. A. H., Takim, R., & Nawawi, A. H. (2020). Client Governing Success Criteria in Building Information Modelling (BIM)-Based Projects. *International Journal of Sustainable Construction Engineering and Technology*, *11*(1), 64-75.

Hadjinicolaou, N., Dumrak, J., & Mostafa, S. (2020). Investigating the Association Between Project Portfolio Management Office Functions and Project Success: An Australian Case Study. In *The 10th International Conference on Engineering, Project, and Production Management* (pp. 287-298). Springer, Singapore.

Hassani-Alaoui, S., Cameron, A. F., & Giannelia, T. (2020, January). "We Use Scrum, but…": Agile Modifications and Project Success. In *Proceedings of the 53rd Hawaii International Conference on System Sciences*.

Hartman, F., & Ashrafi, R. (2004). Development of the SMART Project Planning framework. *International Journal of Project Management*, *22*(6), 499-510.

Haried, P. J., & Claybaugh, C. C. (2017). Evaluating information systems offshore project success: can success and failure coexist? *Journal of Global Information Technology Management*, *20*(1), 8-27.

Hayfield, F. (1979). Basic factors for a successful project. *Proc. 6th Internet Congress* Garmisch-Partenkirchen FRG. Pp. 7-37.

Haass, O., & Guzman, G. (2019). Understanding project evaluation–a review and reconceptualization. *International Journal of Managing Projects in Business*.

Hoegl, M., & Gemuenden, H. G. (2001). Teamwork quality and the success of innovative projects: A theoretical concept and empirical evidence. *Organization science*, *12*(4), 435-449.

Holzmann, V., & Mazzini, L. (2020). Applying Project Management to Creative Industries: The Relationship between Leadership Style and Project Success. *Journal of Organizational Culture, Communications and Conflict*, *24*(1).

Hughes, D. L., Rana, N. P., & Dwivedi, Y. K. (2020). Elucidation of IS project success factors: an interpretive structural modelling approach. *Annals of Operations Research*, *285*(1), 35-66.

IPMA (2019). The Future of Project Management: Global Outlook 2019. Retrieved at https://www.ipma.world/the-future-of-project-management-global-outlook-2019/ (accessed on 24/06/2020)

Joslin, R., & Müller, R. (2016). The relationship between project governance and project success. *International journal of project management*, *34*(4), 613-626.

Jugdev, K. and Muller, R. 2005. A retrospective look at our evolving understanding of project success. Project management journal, 36(4):19-3, Dec.

Kang, M., Lee, G., Hwang, D. W., Wei, J., & Huo, B. (2020). Effects of cross-functional integration on NPD success: mediating roles of customer and supplier involvement. *Total Quality Management & Business Excellence*, 1-17.

Kendra, K. and Taplin, L.J. 2004. Project Success: A Cultural Framework. Project Management Journal, 35(1):30-44.

Kerzner, H. (1987). In search of excellence in project management. Journal of System Management. February 1987.

Kissi, E., Agyekum, K., Baiden, B. K., Tannor, R. A., Asamoah, G. E., & Andam, E. T. (2019). Impact of project monitoring and evaluation practices on construction project success criteria in Ghana. *Built Environment Project and Asset Management*.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, *30*(3), 607-610.

Kristiansen, J. N., & Ritala, P. (2018). Measuring radical innovation project success: typical metrics don't work. *Journal of Business Strategy*.

KPMG (2020). Five pillars of major project success. Retrieved at https://assets.kpmg/content/dam/kpmg/ca/pdf/2019/12/major-project-governance-en-web.pdf (Accessed 0n 25/06/2020).

Kumara, S., and Warnakulasooriya, B. N. F. (2016). Criteria for Construction Project Success: A Literature Review. *SSRN Electronic Journal*. doi:10.2139/ssrn.2910305.

OECD (2000). OECD glossary of evaluation and results-based management terms. Organization for Economic Co-operation and Development, 2000, Paris.

Olawale, O., Oyedele, L., Owolabi, H., Kusimo, H., Gbadamosi, A. Q., Akinosho, T., & Olojede, I. (2020). Complexities of smart city project success: A study of real-life case studies.

Lameijer, B. A., Antony, J., Chakraborty, A., Does, R. J. M. M., & Garza-Reyes, J. A. (2020). The role of organisational motivation and coordination in continuous improvement implementations: an empirical research of process improvement project success. *Total Quality Management & Business Excellence*, 1-17.

Lee, V. H., & Krüger, C. J. (2017, April). The value architecture framework for success of ICT type projects. In *Proceedings of the 2017 International Conference on Information System and Data Mining* (pp. 88-93).

Lim, C.S. and Mohamed, M.Z. 1999. Criteria of project success: an exploratory re-examination, International Journal of Project Management, 17(4):243-248.

Liu, L., Ju, J., Feng, Y., & Hu, Q. (2019, January). Impact of governance structure characteristics of public-private partnerships on smart city project success: evidence from a multi-case study in China. In *Proceedings of the 52nd Hawaii International Conference on System Sciences*.

Luo, L., Zhang, L., & He, Q. (2020). Linking project complexity to project success: a hybrid SEM–FCM method. *Engineering, Construction and Architectural Management*.

Nanthagopan, Y., Williams, N., & Thompson, K. (2019). Levels and interconnections of project success in development projects by Non-Governmental Organisations (NGOs). *International Journal of Managing Projects in Business*.

Netlipse (2016). 10 Years of Managing Large Infrastructure Projects in Europe: Lessons Learnt and Challenges Ahead. Netherlands: Ovimex B.V. Deventer, 2016.

Neubauer, B. E., Witkop, C. T., & Varpio, L. (2019). How phenomenology can help us learn from the experiences of others. *Perspectives on Medical Education, 8*, 90–97. doi:10.1007/s40037-019-0509-2

Neumann, J., Robson, A., & Sloan, D. (2018). Monitoring and evaluation of strategic change programme implementation—Lessons from a case analysis. *Evaluation and Program Planning*, *66*, 120-132.

Nguyen, T. D., Nguyen, T. M., & Cao, T. H. (2016, November). A conceptual framework for IS project success. In *International Conference on Context-Aware Systems and Applications* (pp. 142-154). Springer, Cham.

Nguyen, H. T., & Hadikusumo, B. H. (2018). Human resource related factors and engineering, procurement, and construction (EPC) project success. *Journal of Financial Management of Property and Construction*.

Martens, C. D. P., Machado, F. J., Martens, M. L., & de Freitas, H. M. R. (2018). Linking entrepreneurial orientation to project success. *International Journal of Project Management*, *36*(2), 255-266.

McKinsey (2017). The art of project leadership: Delivering the world's largest projects. McKinsey Capital Projects & Infrastructure Practice September 2017.

Meredith, J. R., & Zwikael, O. (2020). Achieving strategic benefits from project investments: Appoint a project owner. *Business Horizons*, *63*(1), 61-71.

Merrow, E.W. (2011). Industrial megaprojects: Concepts, strategies and practices for success. Hoboken, NJ: John Wiley.

Merrow, E. W. (2012). Oil and gas industry megaprojects: Our recent track record. Society of Petroleum Engineers, *Oil and Gas Facilities*, *1*(02), 38-42.

Meyer, C. (1994). How the right measures help teams excel. Harvard Business Review 1994, 95-103.

Might, R. J. and Fisher, W. A. (1985). The role of structural factors in determining project management success. *IEEE Trans. Eng. Manage*. Vol EM 32 No 2 (May 1985) pp 71-77.

Miller, G. J. (2019, June). A conceptual framework for interdisciplinary decision support project success. In *2019 IEEE Technology & Engineering Management Conference (TEMSCON)* (pp. 1-8). IEEE.

Mkoba, E., & Marnewick, C. (2016, September). IT project success: A conceptual framework for IT project auditing assurance. In *Proceedings of the Annual Conference of the South African Institute of Computer Scientists and Information Technologists* (pp. 1-8).

Morris, P. W., & Hough, G. H. (1987). The anatomy of major projects: A study of the reality of project management.

Morris, P.W.G. (2001). Updating the project management bodies of knowledge. Project Management Journal, 32(3), 21-30, Sept.

Morris, P. W. G. (2004). Moving from corporate strategy to project strategy: leadership in project management. Paper presented at PMI® Research Conference:

Innovations, London, England. Newtown Square, PA: Project Management Institute.

Morris, P. W. G., & Jamieson, A. (2005). Moving from Corporate Strategy to Project Strategy. *Project Management Journal, 36(4), 5–18.* doi:10.1177/875697280503600402

Mubeen, I., Abdullah, M., Yousuf, I., Nazir, M. U., & Hasnain, S. A. (2019). Impact of Software Testing Techniques on Software Project Success through Regression Analysis. *European Online Journal of Natural and Social Sciences*, *8*(3), pp-575.

Müller, R., & Jugdev, K. (2012). Critical success factors in projects: Pinto, Slevin, and Prescott – the elucidation of project success. *International Journal of Managing Projects in Business*, *5*(4), 757-775.

Munns, A. K., & Bjeirmi, B. F. (1996). The role of project management in achieving project success. *International Journal of Project Management*, *14*(2), 81-88.

Neely, A., Adams, C. and Kennerley, M. (2002), The Performance Prism: The Scorecard for Measuring and Managing Business Success, Pearson Education, Upper Saddle River, NJ.

Odabashian, V., HassabElnaby, H. R., & Manoukian, A. (2019). Innovative renewable energy technology projects' success through partnership. *International Journal of Energy Sector Management*.

Oh, J., Lee, H., & Zo, H. (2019). The effect of leadership and teamwork on ISD project success. *Journal of Computer Information Systems*, 1-11.

Osei-Kyei, R., & Chan, A. P. (2018). Evaluating the project success index of public-private partnership projects in Hong Kong. *Construction Innovation*.

Pankratz, O., & Basten, D. (2018). Opening the black box: Managers' perceptions of IS project success mechanisms. *Information & Management*, *55*(3), 381-395.

Pinto, J. K. and Covin, J. G. (1989). Critical factors in project implementation: A comparison study of construction and R&D projects. *Technovation*, *9*(1), 49-51.

Pinto, J. K. and Mantel, S. J. J. (1990). The causes of project failure. *IEEE Transactions on Engineering Management, 37*(4), 269-277.

Pinto, J. K. and Prescott, J. E. (1990). Planning and tactical factors in project implementation success. *The Journal of Management Studies, 27*(3), 305-328.

Pinto, J. K. and Slevin, D. P. (1987). Critical factors in successful project implementation. *IEEE Transactions on Engineering Management, EM34*(1), 22-28.

Pinto, J. K. and Slevin, D. P. (1988a). Critical success factors across the project life cycle. *Project Management Journal, 19*(3), 67-75.

Pinto, J. K. and Slevin, D. P. (1988b). Project success: Definitions and measurement techniques. P*roject Management Journal, 19*(1), 67-73.

Pinto, J. K. and Slevin, D. P. (1989). Critical success factors in R&D projects. *Research Technology Management, 32*(1), 31-36

Pirotti, A., Keshavarzsaleh, A., Rahim, F. & Zakaria, N. (2019). Effective Factors on Project Success in Malaysian Construction Industry. Journal of Engineering, Project, and Production Management. 10. 10.2478/jeppm-2020-0001.

Potter, J. (1996). Representing reality: Discourse, rhetoric and social construction. Sage.

Porter, M. E. (1985). Technology and competitive advantage. The Journal of Business Strategy, 5(3), 60.

PMBOK (2017). A guide to the project management body of knowledge (PMBOK Guide) Sixth Edition. Project Management Institute Inc., Pennsylvania

PMI (2016). Pulse of the Profession, The High Cost of Low Performance: How will you improve your business results?, http://www.pmi.org/~/media/PDF/learning/pulse-of-the-profession-2016.ashx

PMI Pulse of the Profession (2017). PMI's Pulse of the Profession, 9th Global Project Management Survey. Success Rates Rise. Transforming the High Cost of Low Performance. Project Management Institute. 2017. Retrieved from https://www.pmi.org//media/pmi/documents/public/pdf/learning/thoughtleadership/pulse/pulse-of-theprofession-2017.pdf (Accessed on 13/11/2019)

Praxis (2014). The Praxis framework. UK APM. 2014. Retrieved at https://www.praxisframework.org/ (on 19/6/2020)

PressAcademia. (2018, July 9). *How to write a Case Study?* Retrieved from PressAcademia: www.pressacademia.org/how-to-write-a-case-study/

PRINCE2 (2017). The PRINCE2 Manual - Managing successful projects with PRINCE2. 2017 Edition. Axelos.

PWC (2014). Large capital projects in the oil and gas sector: Keys to successful project delivery. 2 October 2014. Retrieved from https://www.strategyand.pwc.com/gx/en/insights/large-capital-projects-oil-gas.html (Accessed on 12/11/2019)

Raziq, M. M., Ahmad, M., Iqbal, M. Z., Ikramullah, M., & David, M. (2020). Organisational Structure and Project Success: The Mediating Role of Knowledge Sharing. *Journal of Information & Knowledge Management*, 2050007.

Rehman, S. U. (2020). Impact of Inclusive Leadership on Project Success. *Journal of Engineering, Project, and Production Management*, *10*(2), 87-93.

Redda, Y., & Turner, R. (2018). Mapping the Success Dimensions of Large Oil and Gas Projects. In *SPE Annual Technical Conference and Exhibition*. Society of Petroleum Engineers.

Rojas, K. M., Sharareh, N., Cosier, L., & Santos, D. L. (2019, September). Considering the Dynamics of FDA Human Factors Validation Requirement: Implications of

Failure and Need to Ensure Project Success-A Conceptual Framework. In *Proceedings of the International Symposium on Human Factors and Ergonomics in Health Care* (Vol. 8, No. 1, pp. 234-247). Sage CA: Los Angeles, CA: SAGE Publications.

Rezvani, A., & Khosravi, P. (2018). A comprehensive assessment of project success within various large projects. *The Journal of Modern Project Management*, *6*(1).

Ritter, T. and Gemunden, H.G. (2004), "The impact of a company's business strategy on its technological competence, network competence and innovation success", Journal of Business Research, Vol. 57 No. 5, pp. 548-56.

Rockart, J.F. 1979. Chief executives define their own data needs. Harvard Business Review, 57(2):81.

Roseke, B. (2018). The IPMA Project Excellence Model. December 28, 2018. Available at https://www.projectengineer.net/the-ipma-project-excellence-model/. (Accessed on 1/12/2019)

Saad, A., Zahid, S. M., & Muhammad, U. B. (2020). Role of awareness in strengthening the relationship between stakeholder management and project success in the construction industry of Pakistan. *International Journal of Construction Management*, 1-10.

Sapolsky, H M. (1972). The Polaris system development. Harvard University Press, Cambridge, MA. p. 246.

Sadeh, A., Dvir, D., Shenhar, A., (2000). The role of contract type in the success of R&D defense projects under increasing uncertainty. Project Management Journal. 2000, 31(3), 14-21

Salman, A., Jaafar, M., Malik, S., Mohammad, D., & Muhammad, S. A. (2020). An Empirical Investigation of the Impact of the Communication and Employee Motivation on the Project Success Using Agile Framework and Its Effect on the Software Development Business. *Business Perspectives and Research*, 2278533720902915.

Samset, K. (2003). *Project evaluation: Making investments succeed*. Akademika Pub.

Saidu, A. I., & Yeom, C. (2020). Success Criteria Evaluation for a Sustainable and Affordable Housing Model: A Case for Improving Household Welfare in Nigeria Cities. *Sustainability*, *12*(2), 656.

Schultz, R.L., Slevin, D.P. and Pinto, J.K. 1987. Strategy and tactics in a process model of project implementation. Interfaces, 17(3):34-46

Seamans, Jr, R. C., & Ordway, F. I. (1977). The Apollo Tradition An Object Lesson for the Management of Large-scale Technological Endeavors. *Interdisciplinary Science Reviews, 2(4), 270–304.* doi:10.1179/030801877789801805

Sebestyen, Z. (2017). Further considerations in project success. *Procedia engineering*, *196*, 571-577.

Seekerexecutive.com (2018). Product life cycle - 5 stages. Retrieved at https://seekerexecutive.com.au/news/learning/product-life-cycle-5-stages/ (Accessed on 26/06/2020)

Serra, C. E. M., & Kunc, M. (2015). Benefits Realisation Management and its influence on project success and on the execution of business strategies. *International Journal of Project Management, 33(1), 53–66.* doi:10.1016/j.ijproman.2014.03.011

Serrador, P., & Turner, R. (2015). The relationship between project success and project efficiency. *Project management journal*, *46*(1), 30-39.

Silva, G. A., Warnakulasooriya, B. N. F., & Arachchige, B. (2016). Criteria for construction project success: A literature review. In *University of Sri Jayewardenepura, Sri Lanka, 13th International Conference on Business Management (ICBM).*

Silva, S. K., Warnakulasuriya, B. N. F., & Arachchige, B. J. H. (2019). A Scale for Measuring Perceived Construction Project Success–Sri Lankan Perspective. *Studies in Business and Economics, 14*(1), 245-258.

Slay, P., Abbasi, A., IMRAN, A., & Lee, C. K. (2018). Failure of Public Sector Programs: A Framework to Manage Success Criteria. In *Project & Program Management Symposium* (pp. 1-16). UNSW@ ADFA, Canberra.

Slevin, D. P. & Pinto, J. K. (1986). The project implementation profile: New tool for project managers. *Project Management Journal, 17*(4), 57-70.

Sharma, S. K., & Chanda, U. (2017). Developing a Bayesian belief network model for prediction of R&D project success. *Journal of Management Analytics*, *4*(3), 321-344.

Shenhar, A. J., Levy, O., & Dvir, D. (1997). Mapping the dimensions of project success. *Project Management Journal, 28*(2), 5-13.

Shenhar, A. J., Dvir, D., Levy, O., and Maltz, A.C. (2001). Project success: A multidimensional strategic concept. *Long Range Planning, 34*(6), 699-725.

Shenhar, A.J., & Holzmann, V. (2017). The Three Secrets of Megaproject Success: Clear Strategic Vision, Total Alignment, and Adapting to Complexity. *Project Management Journal, 48*, 29-46.

Shenhar, A.J., Dvir, D., 2007. Reinventing Project Management: The Diamond Approach to Successful Growth and Innovation. Harvard Business Scholl Press.

Shenhar, A. J., Poli, M., & Lechler, T. (2000). A new framework for strategic project management. In T. Khalil (Ed.), *Management of technology VIII.* University of Miami, Miami, FL.

Shenhar, A., Tishler, A., Dvir, D., Lipovetsky, S., & Lechler, T. (2002). Refining the Search for Project Success Factors: A Multivariate, Typological Approach. *R&D Management, 32*, 111-126. doi:10.1111/1467-9310.00244

Shenhar, A. J., & Wideman, R. M. (1996). Project management: from genesis to content to classification. *Operations Research and Management Science (INFORMS), Washington, DC*. Available at http://www.maxwideman.com/papers/genesis/genesis.pdf (Accessed on 2/12/2019)

Sutton, B. (2005a). Why projects fail - mastering the monster (part 1). Retrieved from http://www.developerfusion.com/article/84858/why-projects-fail-8211-mastering-themonster-part-1/ (Accessed on 25/10/2019)

Sutton, B. (2005b). Why projects fail - mastering the monster (part 2). Retrieved from https://itservicetoday.blogs.com/itil/why_projects_fail/ (Accessed on 25/10/2019)

Sumner, M. (2018). ERP Project Retrospectives—55 Enterprise Systems: Evaluating Project Success, Lessons Learned, and Business Outcomes. *Midwest Association for Information Systems*, 12-23.

Sykes, A. (1982). Reducing neglected risks on giant projects in Kelly A J (Ed.), New *dimensions of project management* Lexington Books, DC Heath and Company, USA.

Takagi, N., Varajão, J., & Nascimento, J. (2019). Contributions for the optimization of the success management in projects through knowledge management practices-research-in-progress.

Takagi, N., Varajão, J., & Ribeiro, P. (2019). Integrating success management into EU PM².

Takagi, N., & Varajão, J. (2019). Integration of success management into project management guides and methodologies-position paper. *Procedia Computer Science*, *164*, 366-372.

Tam, C., da Costa Moura, E. J., Oliveira, T., & Varajão, J. (2020). The factors influencing the success of on-going agile software development projects. *International Journal of Project Management*, *38*(3), 165-176.

Thamhain, H. J. & Wilemon, D. L. (1986). Criteria for controlling projects according to plan. *Project Management Journal, 17*(2), 75–81.

Thomsett, R (2002): Project Pathology, Causes, patterns and symptoms of project failure, https://project-management.com/project-pathology-causes-and-symptoms-of-project-failure/ (Accessed on 8/11/2019)

Trochim, W. M. (2006, October 20). *Social Research Methods*. Retrieved November 10, 2019, from Deduction & Induction: socialresearchmethods.net/kb/dedind.php

Turner, J.R. 1994. Editorial: Project management future developments for the short and medium term. International Journal of Project Management 12(1):3-4.

Turner, J. R., & Xue, Y. (2018). On the success of megaprojects. *International Journal of Managing Projects in Business*.

Turner, R., & Zolin, R. (2012). Forecasting success on large projects: developing reliable scales to predict multiple perspectives by multiple stakeholders over multiple time frames. *Project Management Journal*, *43*(5), 87-99.

UK Oil & Gas Authority (2016). Lessons Learnt UKCS Oil and Gas Projects 2011-2016. Retrieved from https://www.ogauthority.co.uk/media/3380/oga-lessons-learned-from-ukcs-oil-and-gas-projects-2011-2016.pdf (Accessed on 13/11/2019)

Ullah, F., Thaheem, M. J., Siddiqui, S. Q., & Khurshid, M. B. (2017). Influence of Six Sigma on project success in construction industry of Pakistan. *The TQM Journal*.

ul Musawir, A., Serra, C. E. M., Zwikael, O., & Ali, I. (2017). Project governance, benefit management, and project success: Towards a framework for supporting organizational strategy implementation. *International Journal of Project Management*, *35*(8), 1658-1672.

UNDP (2012). UNDP Results Framework Overview. Available at : http://web.undp.org/evaluation/documents/overview-eng.pdf (Accessed on 29/11/2019)

UNDP (2013). Annex 9 Value for Money Principles. United Nations Development Program. Retrieved at www.undp.org › dam › sudan › docs › DCPSF › Annex 9 VfM Principles (Accessed on 20/11/2019)

Varajão, J., & Trigo, A. (2016). Evaluation of IS project success in InfSysMakers: an exploratory case study. In *37th International Conference on Information Systems (ICIS 2016)* (pp. 1-10). Association for Information Systems.

Viswanathan, S. K., Tripathi, K. K., & Jha, K. N. (2020). Influence of risk mitigation measures on international construction project success criteria–a survey of Indian experiences. *Construction Management and Economics*, *38*(3), 207-222.

Wateridge, J. 1998. How can IS/IT projects be measured for success, International Journal of PM. 16(1):59-63.

Welde, M. (2018). In search of success: Ex-post evaluation of a Norwegian motorway project. *Case Studies on Transport Policy*, *6*(4), 475-482.

Wellingtone (2018). The status of project management: Annual Survey. The Wellingtone PPM Intelligence. Supported by APM and UCL. Retrieved from https://www.wellingtone.co.uk/wp-content/uploads/2018/05/The-State-of-Project-Management-Survey-2018-FINAL.pdf (Accessed on 13/11/2019)

Westerveld, E. (2003). The Project Excellence Model®: linking success criteria and critical success factors. International Journal of Project Management, 21:411-418.

Westwood Insight (2018). Why so many oil and gas projects fail to produce as planned. Westwood Global Energy. 2018. Retrieved at https://www.westwoodenergy.com/news/westwood-insight/westwood-insight-many-oil-gas-projects-fail-produce-planned/ (Accessed 19/6/2020)

White, D., & Fortune, J. (2002). Current practice in project management—An empirical study. *International journal of project management*, *20*(1), 1-11.

Winter, G. (2000). A Comparative Discussion of the Notion of 'Validity' in Qualitative and Quantitative Research. *The Qualitative Report, 4*(3). Retrieved from nsuworks.nova.edu/tqr/vol4/iss3/4

Volden, G. H. (2018). Public project success as seen in a broad perspective.: Lessons from a meta-evaluation of 20 infrastructure projects in Norway. *Evaluation and program planning*, *69*, 109-117.

Viswanathan, S. K., Tripathi, K. K., & Jha, K. N. (2020). Influence of risk mitigation measures on international construction project success criteria–a survey of Indian experiences. *Construction Management and Economics*, *38*(3), 207-222.

Yan, H., Elzarka, H., Gao, C., Zhang, F., & Tang, W. (2019). Critical success criteria for programs in China: Construction companies' perspectives. *Journal of Management in Engineering*, *35*(1), 04018048.

Yamin, M., Abdul-Rahman, H., & Alashwal, A. M. (2019). Developing a framework for the success of international development projects in the Maldives. *International Journal of Service Management and Sustainability*, *2*(1), 32-46.

Yap, J. B., Abdul-Rahman, H., & Chen, W. (2017). Collaborative model: Managing design changes with reusable project experiences through project learning and effective communication. *International Journal of Project Management* (35),1253–1271.

Yourdon, E. (1997). Death march: The complete software developer's guide to surviving "mission impossible" projects. Upper Saddle River, NJ: Prentice Hall PTR.

Zaman, U., Nawaz, S., Tariq, S., & Humayoun, A. A. (2019). Linking transformational leadership and "multi-dimensions" of project success. *International Journal of Managing Projects in Business*.

Zidane, Y. J., Johansen, A., & Ekambaram, A. (2015). Project evaluation holistic framework–application on megaproject case. *Procedia Computer Science*, *64*, 409-416.

Zwikael, O., & Smyrk, J. R. (2019). Project Success. In *Project Management* (pp. 153-185). Springer, Cham.