Thesis for the Degree of Master of Engineering

An Investigation of Critical Success Factors (CSFs) for Public Private Partnerships (PPP) in Malaysian Construction Industry

by

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Interdisciplinary Program of Construction Engineering

and Management

The Graduate School

Pukyong National University

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An Investigation of Critical Success Factors (CSFs) for Public Private Partnerships (PPP) in Malaysian Construction Industry

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Abstract

Public Private Partnership (PPP) is an increasingly popular choice for policymakers in implementing important public projects. PPP was officially announced in Malaysia under the Ninth Malaysia Plan in 2006. Since then, many government projects were delivered via PPP. To ensure the ultimate objectives of PPP/PFI, identifying the critical success factors (CSFs) of PPP implementation is crucial. For countries that are new at adopting PPP it is even more important for them to identify the success factors in order to maximize the advantages of this method and to reduce the risks for all concerned parties. Therefore, the factors that are considered critical to the success of PPP project implementation in Malaysia have become a subject for investigation.

There are six objectives that have been formulated to conduct this study including: (1) identify the degree of performance of PPP in Malaysian Construction Industry; (2) identify the relative importance of the CSFs that contribute to the success of the implementation of PPP as perceived by the overall respondents in Malaysian Construction Industry; (3) identify and examine the differences in perception concerning the relative importance of the CSFs between the public and private sectors in Malaysian Construction

Industry; (4) compares the importance of the top CSFs for PPP implementation in Malaysia with four other countries that have adopted PPP to gain the comprehensive view about critical success factors (HK, UK, China, and Australia); (5) determine the appropriate factor grouping for the available critical success factors of PPP; and (6) construct potential effective strategies for improvement of PPP procurement.

A questionnaire survey was used to elicit the perceptions of public and private sectors on the key CSFs of PPP projects in Malaysia. In total, 55 usable responses were analysed using SPSS to rank the importance of the CSFs and to examine the differences in the perceptions between the government and the private sectors. The results show that commitment and responsibility of both public and private sectors, transparency in the procurement process (process is made open and public), multi-benefit objectives, good governance and project technical are the top five CSFs of PPP implementation in Malaysia. Although the rankings of many factors were different between the public and private sectors, there were no significant differences in the perception of the public and private sectors concerning the importance of the CSFs. Evidence obtained from prior studies on the CSFs of Hong Kong, China, Australia and UK was compared to the top CSFs for PPP in Malaysia. There were mixed results concerning the comparison of CSFs between Malaysia and four other countries.

The results of this survey were continued to be analysed by the factor analysis technique. The findings showed that the 17 CSFs could be grouped into six underlying factors including: factor grouping 1- project implimentability, factor grouping 2- shared responsibility between public and private sector, factor grouping 3- government guarantee, factor grouping 4- efficient procurement process, factor grouping 5- political support and factor

grouping 6- multi-benefit objectives. These findings should influence policy development towards PPPs and the manner in which partners go about the development of PFI projects.

The main contribution of this study is supplement and improves knowledge in the management of PPP projects by exploring the relative importance of CSFs associated with PPP construction projects in the Malaysia. Several recommendations have been suggested in order to improve the overall performances of Malaysian PPP procurement.

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CHAPTER 1

INTRODUCTION

1.1 Research background

Over the last two decades, governments of a growing number of countries initiated public–private partnerships to let the private sector take over the responsibility for building an infrastructure and subsequently operating it to provide public goods or services. In industrialized countries as well as in emerging economies, public–private partnerships have been set up for large-scale projects in various sectors such as public transportation, health care, and education (Hoppe et al., 2011). Most of the Commonwealth countries are using PPPs and PFIs to improve economic competitiveness and infrastructure services. Therefore, the Private Finance Initiatives (PFI) Programme was announced in the Ninth Malaysia Plan in March 2006, aimed at facilitating greater participation of the private sector to improve the delivery of infrastructure facilities and public service. It sets out many of the key principles on how some of the public sector infrastructure projects will be procured and implemented. PFI will be undertaken as part of the new modes of procurement under the Public Private Partnerships (PPP) to further enhance private sector participation in economic development. The terms PPP and PFI have often been used inter-changeably throughout the world, for Malaysia, the PFI principles as announced in the Ninth Malaysia Plan form a subset of the umbrella PPP principles (PPP Unit, Prime Minister Department, 2009). PPP will be employed for infrastructure and service development projects that

meet two conditions. First, the implementation of PPP must be able to make government projects more efficient where the risks and rewards are optimally shared between the two parties. Second, PPP is to be used where government support enhances the viability of the private sector projects in strategic or promoted areas (Ninth Malaysia Plan, 2006).

From time to time, various public agencies in Malaysia have developed houses using the public-private partnership (PPP) approach. The few failed housing PPP projects captured by National Audit point to the necessity for proper implementation (Abdul-Aziz et al, 2011). Though it may seem that PPP are the answer to governments' infrastructure funding problem, but there are many issues that need to be addressed before PPPs and PFIs can be used effectively as another form of public procurement, otherwise, these projects can turn out to be nightmares for policymakers and implementers. It is recognized that since the political, constitutional, legal economic and social circumstances of every country differ, there can never be a single blueprint of how a PPP programme works. Each government has to devise its own programme to suit local conditions (Yong, 2009). The Malaysian version of PPP is fundamentally at a young stage and there is no right or wrong in creating Malaysia's own version of PPP as long as holistic, structured and sustainable for procurement solution is in place because implementing PPP projects is not easy, but the benefits, if done properly, are many (Zainon et al., 2013 and Yong, 2009). Since PPP/PFI contracting still new in Malaysia, the contract clauses still contain gaps which subject to contractual deficiency issue. The deficiency refers to the missing elements of sustainable development in which is not properly tailored to PPP/PFI contracts. The challenge here depicts a consistent need in engaging the fundamental knowledge of sustainable development among professionals. Thus, the implementation of PPP/PFI contracts is in jeopardy (Ros et al., 2011). The

PPP contracts are urged to be constantly reviewed and revised by the Malaysian government to improve the present practice of PPP implementation to ensure the achievement of its ultimate objectives (Suhaiza, 2013). For countries that are new at adopting PPP it is even more important for them to identify the success factors in order to maximize the advantages of this method and to reduce the risks for all concerned parties (Cheung et al, 2012). Therefore, the factors that are considered critical to the success of PPP project implementation in Malaysia have become a subject for investigation.

1.2 Problem statement

Private finance initiatives do not automatically lead to successful infrastructure projects. The PPP schemes should be well structured because various problems have been encountered in PPPs in worldwide infrastructure development. One problem is the slow progress in the implementation of PPPs. There are other serious problems and even failures of PPP projects (Zhang, 2005). For example, the strong public opposition to some privatized projects in the Lao PDR (Pahlman, 1996) and in some states in the United States (Levy, 1996), the failures of two build–operate–transfer (BOT) projects in Thailand due to political instability and other reasons (Ogunlana,1997) and the failure of Malaysia's privatized national sewerage project (Abdul-Aziz,2001). Therefore, researchers worldwide have been keen to discover the key ingredients for delivering successful PPP projects (Cheung et al, 2012).

The study of project success and critical success factors (CSFs) is often considered as one of the vital ways to improve the effectiveness of project delivery (Chan, 2004). One of the reasons of the difficulties in managing a construction project, especially in the government sector is due to the failure

in determining the CSFs across project phases (Takim et al., 2004). Thus, the worldwide trend towards PPPs creates an urgent need for a workable and efficient procurement protocol for improved practices in future PPP projects (Zhang, 2005). One critical step in the development of such a protocol is to identify, analyze, and categorize various factors that are critical to the success of PPPs in general (Zhang, 2005).

Numerous studies have been conducted over the years to investigate factors that are really critical towards projects' success, thus highlighting the importance of CSFs study towards construction project success (Yee and Mustaffa, 2012). While these studies have developed different lists of critical success factors (CSF) for PPP/PFI projects, similarities can be found. Less is known about the relative importance of these CSFs (Li et al., 2005). A number of factors combine to determine the success or failure of an infrastructure project in terms of its objectives (i.e., cost, time, and quality). The identification of the CSFs for these objectives will enable efficient allocation of limited resources (Zhang, 2005).

The purpose of this research is to study the principal factors that are critical to the success of PPP construction project in Malaysia because re-exploring the principal factors essential to the success of the PPP construction project will help in gaining a better insight towards the industry. This research will also determine their relative importance as perceived by different respondents because success within the context of a public-private partnership may well mean different things to different stakeholders. The public and private sectors in PPP projects will have some common goals but they will also have several project and long-term aims that are very different. Furthermore, it is vital to put forward the differences in the opinion of the two

parties because each party plays a different role in a PPP contract (Suhaiza, 2013).

1.3 Research aims and objectives

Since PPP contract is still new in Malaysia, the contract clauses still contain gaps which are subjected to contractual deficiency issue. This study is attempted to fill in the gap by exploring and re-examining the critical success factors (CSFs) necessary for adopting public private partnerships (PPPs) in Malaysian construction industry, in general, without referring to any specific PPP sector or project. Therefore, this research aims to supplement and improve the knowledge in managing PPP projects by exploring the relative importance of CSFs associated with PPP construction projects in the Malaysia. Second, this research intends to aid PPP users to improve their understanding of critical success factors of current Malaysian PPP in the early stage of projects through different perspectives of respective public and private sector participants because each party plays a different role in PPP procurement. In addition, this research also aims to provide a guideline of possible improvements and strategy that could be executed in strengthening PPP implementations by government in order to form an ideal Malaysian version of PPP that able to deliver better quality of service in future. Thus, to facilitate this particular aims, objectives have been formulated namely:

- To identify the degree of performance of PPP in Malaysian Construction Industry.
- To identify the relative importance of the CSFs that contributes to the success of the implementation of PPP as perceived by the overall respondents in Malaysian Construction Industry.

- To identify and examine the differences in perception concerning the relative importance of the CSFs between the public and private sectors in Malaysian Construction Industry.

- To compare the importance of the top CSFs for PPP implementation in Malaysia with four other countries that have adopted PPP to form an ideal Malaysian version of PPP (HK, UK, China, and Australia).

- To determine the appropriate factor grouping for the available critical success factors of PPP

- To identify and construct potential effective strategies for improvement of PPP procurement.

1.4 Scope of research

This research only focuses on reviewing the critical success factor of PPP procurement in Malaysia construction industry. Critical success factor of other procurements are not the scope of study in this research.

The area of this research is confined to Malaysia only. The data are mainly collected through questionnaires that have been sent to the respondents by electronic mailing and internet survey link (a survey tool supported by Google) to selective group of respondents for the public and private sectors. The respondents are mainly people who have a leading role in the construction management, e.g., project managers, site managers, team leaders (QA, QC and QS), site engineers, and supervisors.

The conducted sample surveys are not to be considered as a specific case in depth, but to capture the main characteristics of the population using a fixed

sample. Thus, there is no limitation imposed to the level of qualification and working experience of the respondents. Moreover, the data collection is conducted from March 2014 to April 2014. Only the returned completed questionnaires that received during the designated period are analysed, and the responses beyond this time frame are ignored.

1.5 Limitations of research

The explorative approach for this research is mainly based on structured surveys to be carried out by distributing questionnaires. Therefore, the feedbacks from the respondents provides as a sole dependable source of result in supporting the research findings. Field data collections for all the local construction projects help in verifying the feedbacks from the structured surveys. However, due to the time constraints and the insignificance of field data collections, they are discarded from the research design. It is recommended that further studies on this field should be carried out as collective efforts to justify the finding of this research.

The data are mainly collected through questionnaires that were sent to the respondents by electronic mailing and internet survey link (a survey tool supported by Google) to selective group of respondents for the construction and consultant firms in public and private sectors due to distance constraint between Korea and Malaysia.

1.6 Significance of the Research

The findings will provide the researcher an up-to-date understanding towards the current PPP conditions of the local construction industry. Perceptions of different construction participants on the CSFs of construction projects in Malaysia will be examined. Understanding the importance of CSFs will enable the researchers to have a clearer direction on the subject matter and to avoid possible confusion in PPP procurement process. Therefore, the unique contribution of this study is that it highlights not only the important success factors for PPP implementation in Malaysia, but also offers evidence concerning the importance of the factors of the two key parties involved in PPP– the public sector and private sector.

The findings of this research will provide the researchers latest information in formulating appropriate PPP strategies to address the challenges brought by human-related issue. As part of the wider aspect of an ongoing research and its finding will be used to develop a new PPP procurement system in Malaysia, this research will seek to give its attention to the CSF of PPP project management in Malaysia. It is anticipated that the results presented in this research will assist both the public and private sectors to deliver PPP projects more successfully.

1.7 Structure of thesis

The structure of this thesis has been designed to suit six distinct research objectives above. The structure is orderly organized into five chapters. Table 1.1 presents the content summary for each chapter of thesis as below.

Table 1.1 Content summary for thesis's chapters

Chapter	Brief contents
1. Introduction	This chapter covers the overall perspective for the research including research background, problem statement, research objectives, scope of research, limitations of research, and expected contribution.
2. Literature Review	A literature review is done to scan and summarize the previous studies about the current situation of Malaysia PPP, the current problems of PPP construction, the critical success factor of PPP in construction, the use of critical success factors in PPP construction and the relationship of CSFs and PPP in Malaysian Construction Industry.
3. Research methodology	Short discussion about research methodology, the difficulties when conducting the study, and the reasons for applying the methodology are introduced. This chapter focuses on the questionnaire design, questionnaire distribution, data collection, and data analysis. Moreover, detailed introduction about analysis tools and methods are put in this chapter.
4. Results and Discussions	This chapter will focus on two tasks: • Present the findings of this study about CSFs of Malaysian PPP that include: the current performance of PPP in Malaysian Construction Industry, the relationship of CSFs and PPP in Malaysian Construction Industry, the relative importance of the CSFs as perceived by the overall respondents in Malaysian Construction Industry, the differences in perception concerning the relative importance of the CSFs between the public and private sectors in Malaysian Construction Industry.

	• Some discussion and conclusions are made in this chapter.
5. Conclusions and recommendations	A general conclusion about the achievements of study and the brief conclusions for each research objective are presented. The detailed limitations and future research proposals are also pointed out at the end of this chapter

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

A country's development plan is a mean to execute the nation's aims and objectives. Malaysia, like other developing countries requires sound and effective development plans to achieve its socio-economic objectives. With a total population of 28.3 million, Malaysia aims to provide better and efficient public services to all its citizens. Malaysian multi-ethnic citizens that consists of Bumiputera (67.4%) [Bumiputera is a term used for the ethnic Malay and other native ethnic groups of the Sabah and Sarawak states, who made up of 2/3rd of the Malaysian people], Chinese (24.6%), Indian (7.3%), and others (0.7%) (Malaysia CENSUS 2010), have created multi-religious and multi-cultural environment. The existence of different races has influenced the lives of Malaysian citizens‟ in many ways. This requires the government to formulate sound infrastructure policies and allocate of resources for infrastructure development that meet the requirement of all races in Malaysia.

In the past development of infrastructure in Malaysia received the largest share of public sector development expenditure in the Malaysian five years plans. In early 1990s due to resource constraints faced by the public sector, Malaysian Government decided to encourage and facilitated private sector participation in its infrastructure development. Since then, the involvement of the private sector has promoted PPP/PFI procurement under subsequent Malaysian development plans. In recent years, there have been an increasing

market of PPP/PFI for the development and operation of infrastructure projects in Malaysia.

2.2 Public Private Partnership (PPP)

Akintoye et al. (2003) define PPPs as a long-term contractual arrangement between a public sector agency and a private sector concern, whereby resources and risk are shared for the purpose of developing a public facility. The principal aim of a PPP for the public sector is to achieve value for money in the services provided while ensuring that the private sector entities meet their contractual obligations properly and efficiently (Grimsey and Lewis, 2002). PPPs are a means of public sector procurement using private sector finance and best practice. PPPs can involve design, construction, financing, operation and maintenance of public infrastructure and facilities, or the operation of services, to meet public needs. They are often privately financed and operated on the basis of revenues received for the delivery of the facility and/or services.

One key to this is the ability of the private sector to provide more favourable long term financing options than may be available to a government entity and to secure the financing in a much quicker time frame (The National Council for Public – Private Partnerships (NCPPP), 2003). Such contracts are long-term in nature and typically 25-30 years. According to Mustafa (1999), PPPs address the common faults that are associated with public sector procurement such as high construction costs, construction overruns, operational inefficiencies, poor design, and community dissatisfaction. The PPP is founded on transfer of risk from the public to the private sector under circumstances where the private sector is best placed to manage risk. One of

the key features of the PPP which is appealing to the government is the shift of project risks from the public sector to the consortium involved with the project even though this requires a profit incentive to the project consortium (Grimsey and Lewis, 2002). PPPs are being established as a cost effective method of overcoming costs associated with the provision and maintenance of infrastructure. Duffield (2001) identifies recent Australian examples of PPPs that include the New Prisons Project in Victoria, New South Wales Schools Project and Sydney's Cross City Tunnel.

PPPs have multiple objectives including promoting infrastructure development, developing local economy, reducing costs, increasing construction and operation efficiencies, and improving service quality by incorporating the private sector's knowledge, expertise and capital (Yuan et al., 2009). When PPP projects were first launched in the UK, the government appeared to view them primarily as a way of getting infrastructure costs of the public balance sheet, keeping investment levels up, cutting public spending and avoiding the constraints of public sector borrowing limits (Li et al., 2005). However, Li et al. (2005) argue that the impact of government borrowing is much less significant than at first thought and that PPP is now seen as essentially a new approach to risk allocation in public infrastructure projects. Li (2003) demonstrates that the most significant factors associated with PPP procurement are: a lot of management time spent in the contract transaction, lengthy delays in negotiation and high participation cost. Problems reported with PPP procurement include: high cost of tendering, complex negotiation, cost restraints on innovation, and differing or conflicting objectives among the project stakeholders (Akintoye et al., 2001).

According to HM Treasury (2000), there are different forms of PPPs the major ones being: asset sales, wider market, sales of business, partnership

companies, private finance initiative (PFI), joint ventures, Build Own Operate and Transfer (BOOT), investment partnerships and policy partnerships. The most commonly used PPP model in the UK is the PFI (HM Treasury, 2000).

Different options of Public Private Partnership (PPP) have continued to emerge in the recent. The classifications that are common in literature are (Babatunde et al, 2010):

- DBFT (Design, Build, Finance and Transfer): In this system, the developer develops the structure using his own generated finance, after construction and certain agreed period of ownership transfers the whole facility back to the government.
- BOT (Build, Operate and Transfer): This system allows the developer a use of the project for a certain period of time before transferring the project to the government.
- BOO (Build, Operate and Own): In this format the ownership is not transferred.
- BOOST (Build, Own, Operate, Subsidize, and Transfer): In this system, government provide incentives to users of the completed project in other to make it financially viable for the private consortium.
- BTO (Build, Transfer, and Own): This variation relieves the consortium of the insurance cost for operation.
- BOOT (Build, Own, Operate and Transfer): Under this variation, the developer is allowed full unalloyed ownership of the completed structure for a specific period of time at the end of which he

relinquishes his full right to the actual owner, while the building is still in completely functional state.

- BLT (Build, Lease and Transfer): Under this variation, the developing firm or consortium is allowed to lease out the completed facility out and recoup her money before transferring the completed facility to the owner at an agreed time.

Public Private Partnership (PPP) procurement processes are complex, given both the longer time frames and wider scope of services contracted. Besides, the numerous parties involved in a PPP project make the stakeholder relations much more complex than in other procurement systems. The increasing frequency and significance of PPP is accompanied by problems of instability and poor performance (Zou et al, 2014).

One major problem that has been encountered is the slow progress in the execution of BOT (Aayushi et al, 2013). There are other serious problems like legal, political, environmental, etc. that have even led to failures of BOT projects worldwide. For example, the strong public opposition to some privatized projects in the Lao PDR (Pahlman, 1996) and in some states in the USA (Levy, 1996), the failures of two BOT projects in Thailand due to political instability and other reasons (Ogunlana, 1997) and the failure of Malaysia's privatized national sewerage project (Abdul-Aziz, 2001).

Clearly, such problems are not costless. PPP typically involves commitment of substantial resources from both sides. Therefore, failure can result in a loss of competitive position far beyond merely the opportunity cost of the resources deployed in the PPP itself; while synergistic gains and expected positive spillover effects for the parent organization may not be realized (Jacobson and Choi, 2008).

2.2 Public Private Partnership (PPP) In Malaysia

As stated in various documents, the Malaysian government believes that economic growth is not an end in itself but a means to bring prosperity and better development planning. Hence, the principle of “growth with equity” has underlined most of Malaysian development efforts since the 1970s, and is embodied in all Malaysian five years plans (Nooriha et al, 2014). Therefore, the evolution of PPP/PFI procurement in Malaysia began with the introduction of privatisation. The history of privatisation in Malaysia can be traced back to 1983 when the government first launched its Privatisation Policy. This included some policies in Malaysian Incorporated Policy 1981, which provides the framework for closer cooperation between the public and the private sectors. The methods of implementing privatisation can include a single method or a combination of sales of equity or assets, lease of assets, management contract, Built-Lease-Transfer (BLT) and build-operate-transfer (BOT) or build-operate. Thus, the concept of PPP has existed since the mid-1980s, as a result of Malaysia’s previous privatization program and the adverse impact of the world economic recession that caused the government to seek assistance from the private sector for the development and economic activities of the country (Ismail and Rashid, 2007; Rusmani, 2010). The Malaysia Incorporated Policy was introduced in 1981 to encourage cooperation between the public and private sectors whereby both sectors act and operate within a "Malaysian Company". Through this policy both parties depend on each other; where the private sector upholds the commercial and economic activities, while the public sector draws up major policies, identify the direction and provides the specialised supporting services which are conducive to the success of businesses (Ukas, 2014). PPP is seen as a

derivative of privatization, a concept that emerged under the administration of Mahathir Mohamad who emulated the initiative of Margaret Thatcher in the United Kingdom. (Kuppusamy, 2010)

When the PPP program was first introduced, there was no clear distinction between PPP and privatization. In order to facilitate its implementation, the Government published a document entitled Guideline on Privatisation in 1985. This guideline was subsequently superseded by the Privatisation Master plan in 1991. The Master plan contains an overall policy framework for privatization; its objectives, models, guidelines on asset and equity valuation, staffing and ownership structure as well as changes to relevant laws and regulations. In the light of further refinement to the partnership concept, the Government has introduced a new guideline in 2009 entitled PPP Guideline. This Guideline complements the Privatisation Master plan, particularly for projects where a Government entity is the paying party. It also provides greater clarity as to the types of project suitable for the PPP approach, procedures to follow when making proposals, qualifying criteria for bidders for the projects, operating models, payment mechanisms and process flow for project approvals (ERIA, 2013).

Since Malaysia has the target to become an industrialized and a developed nation by the year 2020 as stated in vision 2020 introduced by the fourth Prime Minister, several policies have been introduced to enforce relationship between public and private sectors in delivering the public projects (Nambiar, 2007; Rusmani, 2010). The main objective of these policies is to lessen the financial and administrative burden of the Government, improve skills and production, accelerate economic growth, reduce the size and involvement of the public sector in the economy, and to assist in reaching the country's economic policy's goal (Ukas, 2014). Therefore, the evolution of

PPP regulation in Malaysia had been started from privatization of the 4th Malaysia Plan Incorporated in 1981, 5th Malaysia Plan Privatization Policy in 1985, 6th Malaysia Plan Privatization Master Plan in 1991 as well as PPPs in the 8th Malaysian Plan, 9th Malaysia Plan and 10th Malaysia Plan (Ismail and Yusof, 2009; Tenth Malaysia plan, 2010). Not all projects implemented under the privatisation policy were successful, which motivated Malaysia government to enhance its privatisation concept. The government decided to streamline privatisation by adopting new approaches such as the PPP/PFI model and mechanisms to enhance the efficacy of the privatisation programme. PPP/PFI involves transferring responsibility to finance and manage capital investment and services from the public sector to the private sector in return for lease charges that are commensurate with the quality of services and an amount sufficient to ensure commercial returns on investment (Azmi, 2008).

Under the Ninth Malaysia plan, the government officially announced the implementation of public projects using the Public Private Partnership (PPP) or Private Finance Initiative (PFI) scheme (Ninth Malaysia Plan, 2006). The PPP is formally defined in the Ninth Malaysia Plan report (2006) as:

"*the transfer to the private sector the responsibility to finance and manage a package of capital investment and services including the construction, management, maintenance, refurbishment and replacement of the public sector assets which creates a standalone business. The private sector will create the asset and deliver a service to the public sector client. In return, the private sector will receive payment commensurate with the levels, quality and timeliness of the service provision throughout the concession period*" (Ninth Malaysia Plan, 2006).

The main objective of PPP/PFI in Malaysia is to revise and improve the implementation process of the existing privatization policy (Ninth Malaysia Plan, 2006 and Tenth Malaysia plan, 2010). PPP/PFI will be employed for infrastructure and service development projects that meet two conditions. First, the implementation of PPP/PFI must be able to make government projects more efficient where the risks and rewards are optimally shared between the two parties. Second, PPP/PFI is to be used where government support enhances the viability of the private sector projects in strategic or promoted areas (Ninth Malaysia Plan, 2006). In order to facilitate the implementation of PFIs, the Ministry of Finance Malaysia has acquired a substantial amount of funds to facilitate the first wave of PFI implementation in Malaysia (Jayaselan and Tan, 2006). The Employee Provident Fund (EPF) Department has agreed to invest RM 20 billion in terms of loan to facilitate PFI projects under the Ninth Malaysia-Plan (Ninth Malaysia Plan, 2006).

In line with the Government's new approach based on the new economic model in the Tenth Malaysia Plan, the Government intends to stimulate its effort in encouraging the private sector to invest in development projects. As such, the Government's allocation for development projects will be reduced and it can then shift its attention to projects that will be implemented and funded by the private sector whether through Privatisation and Public Private Partnerships (PPP), or through direct investment of the private sector in country's development programme. The Government has also set up a facilitation fund under the Tenth Malaysia Plan in order to support development projects implemented by the private sector as the Government's contribution through the cooperation of the public and private sectors (Tenth Malaysia Plan, 2010). For the current rolling plan (2011-2012), 52 projects worth RM63 billion are under various stages of implementation and they are

to complement conventionally procured development projects with allocation of RM99 billion.

In 2009, in order to elucidate the key principles of PPP/PFI procurement the Public Private Partnerships Unit (3PU) issued PPP/PFI Guidelines aiming to address some of the key attributes of the PPP/PFI model. The conceptual framework of PPP/PFI in Malaysia is similar to that of the UK PPP/PFI (Takim et al., 2009). For instance, the concession period of between 20 to 30 years requires the private sector to deliver public infrastructure-based service, while the private sector is compensated through lease rental charges commensurate with the levels, quality and timeliness of the service provision throughout the concession period. The structure of the lease rental payment for PPP/PFI projects guarantee a total return to the concessionaire's capital investment expenditures including financing cost repayment and profit of investment. Payment is based on Key Performance Indicator (KPI) for the services. At the end of the concession period, most of the assets are usually transferred to the public sector (3PU, 2010).

Since the introduction of the PPP approach in 1983, more than 500 projects have been implemented using PPP / Privatization approach. These projects cut across a variety of sectors, such as transport, highways, communication, health, energy and utilities, education and training and general administration. Given the differences in output specifications, risk appetite, payment structure and a host of other factors, four distinct PPP models have been adopted (ERIA, 2013). These are:

1. Concession Model: This model is used for highways/ bridges and it is normally structured on the BOT (Build Operate, Transfer) concept.

2. Accommodation Model: This is used for administrative complexes, teaching hospitals and university branch campus projects. The model is typically structured on the BLMT approach. Recently, Government has introduced the BLMOT (Build, Lease, Operate, Maintain and Transfer) approach for this model too.

3. Process Plant Model: This particular model is being used for power generating projects. It is structured with two forms of payment, a fixed capacity payment and a utilization payment.

4. Usage Model: This model is suitable for projects with high risk of technology obsolescence where Government is not planning to take ownership of the underlying asset upon the expiry of the contract, such as for services in sophisticated medical facilities. Investment is recouped from charges imposed on the utilization of the facilities by the ultimate users, i.e. user charges.

2.3 Critical success factors (CSFs) of PPP

What is a critical success factor (CSF)? Rockart (1982) defines CSF as those relatively small numbers of truly important matters where a particular industry should focus her attention in order to achieve success. They represent "factors" which are "critical" to the "success" of the industry concerned in Rockart's studies. Rockart (1982) elaborated that the key to success is to focus the most limited resources (usually time) on the things which really make the difference between success and failure. Sanvido et al. (1992), Tiong (1992) and Cooke-Davies (2002) also defined CSFs as those factors which are necessary for the project participants to achieve their goals in a project.

Rockart (1982) further emphasised that CSFs relates to the specific characteristics or conditions of an industry. It will certainly differ from country to country depending on their respective operating environment, policies and legal constraint. In addition to that, CSFs often will change as the industry's environment changes, as the company's position within an industry change, or as particular problem or opportunity arises for that industry. Hence, it is essential to understand what CSFs are not. They are not a standard set of measurement or key indicators, which can be applied to all industry. On the contrary, CSFs are the particular areas of major importance to a particular industry, at a particular point in time. They demand specific and diverse situational measures, many of which must be evaluated through soft, subjective information (Rockart and Bullen, 1981).

In terms of CSFs of PPP projects, studies have emerged since the 1990s (Suhaiza, 2013). A number of CSFs or drivers to the success of PPP/PFI projects were explored by various researchers. For instance, Tiong (1996) identified CSFs in PPP projects based on BOT model as project technical feasibility; strong private consortium; stable macro-economic environment;

and favourable legal framework. Qiao et al. (2001) identified CSFs as stable macro-economic environment; technical innovation and technology transfer; available financial market; political stability and social support; good governance; and projects technical feasibility.

The UK has a long history in adopting the PPP model. Consequently, there has been a large number of studies produced looking at factors leading to successful PPP projects. For example, Pinder (2004) conducted a questionnaire survey with 701 respondents in the UK involved with the PPP process. The findings highlighted four main critical success factors for conducting PPP projects including: well-drafted output specification; a robust business case; committed senior management; and full consultation with end-users. Li et al.'s (2005) study was also conducted in the UK at a similar time as Pinder et al.'s. They found both similar and dissimilar findings. The factors contributing to successful projects included: effective procurement; project implementability; government guarantee; favorable economic conditions; and available financial market.

Kwak et al. (2009) were also interested in looking at the factors contributing to successful PPP projects. Consequently, they analysed five relevant research studies of different jurisdictions. The findings indicated that there were four main aspects which would lead to successful PPP projects in general. These included:

(1) The competence of the government;

(2) The selection of an appropriate concessionaire;

(3) An appropriate risk allocation between the public and private sectors;

(4) A sound financial package.

In jurisdictions that are new to delivering PPP projects, researchers found that the successful implementation requires a stable political and social environment. This environment heavily relies on the stability and capability of the host government (Wong, 2007). Political and social issues that go beyond the private sector's domain should be handled by the government. If unduly victimized, it is legitimate that the private sector participants should be adequately compensated. Unstable political and social environments have resulted in some failed rail projects. For example, in Bangkok, the frequent change in government premiers has led to the cancellation of many new public infrastructure projects originally procured under the PPP approach (Khang, 1998; Cobb, 2005).

In respect of specific case studies, Jefferies et al. (2002) examined the CSFs of a stadium in Australia, which was built using the Build Operate Own Transfer (BOOT) mode of PPP. The authors identified and examined 15 success factors relevant to the project and the most significant CSFs include: 'compatibility/complimentary skills among the key parties', 'technical innovation in overcoming project complexity' and 'efficient approval process'. Other important success factors include 'environmental impact', 'developed legal/economic framework', 'political stability', 'selecting the right project', 'existing strategic alliances', 'good resource management', 'trust', 'community support', 'feasibility study', 'transfer of technology', 'financial capability', and 'consortium structure'. Likewise, Jefferies (2006) investigated the CSFs of the Super Dome PPP project, which was also constructed using the BOOT scheme. The study considered the same CSFs examined in Jefferies et al. (2002) and included new success factors: 'negotiation', 'client brief/outcome', 'bid feature', 'business diversification', 'business viability', 'competition', 'credit rating investor', 'teamwork', 'existing infrastructure', 'delivery of asset', 'investment growth', and 'project identification'. The

findings reveal that the most important success factors for the Super Dome project are: 'the issue of bidding, which is successfully managed by the Government', 'the project agreement, which is a very streamlined approval' and 'the negotiation process'.

Jamali (2004) investigated the CSFs for PPP implementation in the telecommunication industry in Lebanon. Using a case study approach, the findings indicate that 'trust', 'openness' and 'fairness' are basic foundational underpinnings of successful PPPs. Zhao et al. (2010) investigated the factors contributing to the success of two PPP power projects – thermal power and wind power – that were developed using the Build Own Transfer (BOT) mode. From an extensive review of relevant literature and interviews with experts, the authors identified 31 success factors for the power projects. Then a questionnaire survey was conducted to investigate the relative importance of the success factors specific to the individual thermal and wind power. The results revealed common CSFs for the two projects, which include: 'the necessity for the project', 'the expected debt paying ability of the project' and 'the financial capacity of the contractor'. In addition, there are CSFs that are unique to the individual projects. For the thermal power, 'level of project financing management of the project company' and 'level of business operation and qualification of the contractor' are the important success factors while for the wind power, 'competency of personnel of the project company', 'financial capacity of the contractor', 'expected profitability of the project', and 'legal environment' are the CSFs.

In particular, the research of Li et al. (2005) had conducted an extensive review into the success factors and summarized them into eighteen CSFs. Factor analysis was subsequently carried out to classify these factors into five main groups namely (i) effective procurement; (ii) project implementability;

(iii) government guarantee; (iv) favourable economic conditions; and (v) available financial market. Furthermore, Abdul Aziz (2010) who adopted a questionnaire survey and interviews to examine the CSFs of ten PPP housing projects in Malaysia. The study identified 15 success factors for PPP housing projects: *'action against errant developer', 'robust and clear agreement', 'reputable developer', 'constant communication', 'developer's profit sharing accountability', 'developer's social accountability', 'house buyer's demand', 'negotiation skills', 'adequate negotiation staff', 'realistic projection', 'competition', 'ample time to evaluate proposal', 'political influence', 'consistent monitoring',* and *'compatibility between partners'*. The results reveal that all 15 factors except *'political influence'* contribute significantly to the success of a PPP housing project.

After relevant published literature including textbooks, research reports, journal articles, conference papers, and internet material were reviewed; the critical success factors have been distilled into eighteen (18) CSFs and formed a summary of the analysis of these pieces of literature, as shown in Table 2.1.

Table 2.1 Summary of Critical Success Factors for PPP projects

No.	Critical Success Factor	Public Sector
1	Commitment and responsibility of public and private sectors	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Li et al (2005)
2	Transparency in the procurement process (process is made open and public)	Cheung et al (2012), Chan et al (2012), Solomon (2012), Li et al (2005), Jefferies (2006), Corbett and Smith (2006), Zhang (2005), Qiao et al (2001), Tam et al (1994), Tiong (1996), Suhaiza (2013), Jefferies et al (2002)
3	Multi-benefit objectives	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Li et al (2005)
4	Good governance	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Li et al (2005)
5	Project technical feasibility	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Aayushi et al (2013), Jefferies et al (2002), Qiao et al (2001), Li et al (2005)
6	Well-organized public agency	Cheung et al (2012), Chan et al (2012), Solomon

		(2012), Suhaiza (2013), Li et al (2005)
7	Thorough and realistic cost/benefit assessment	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Li et al (2005)
8	Available financial market	Cheung et al (2012), Chan et al (2012), Solomon (2012), Li et al (2005), Corbett and Smith (2006), Zhang (2005), Suhaiza (2013), Jefferies et al (2002)
9	Competitive procurement process (enough potential bidders in the process)	Cheung et al (2012), Chan et al (2012), Solomon (2012), Li et al (2005), Jefferies (2006), Corbett and Smith (2006), Zhang (2005), Qiao et al (2001), Tam et al (1994), Tiong (1996)
10	Sound economic policy	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Li et al (2005)
11	Appropriate risk allocation and risk sharing	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Zhang (2005), Qiao et al (2001), Aayushi et al (2013), Jefferies et al (2002), Li et al (2005)
12	Strong private consortium	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Corbett and Smith (2006), Zhang (2005), Abdul-Rashid et al (2006), Tam et al (1994), Tiong (1996), Jefferies et al (2002), Li et al (2005)
13	Stable macro-economic environment including low inflation, stable exchange and interest rates	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Qiao et al (2001), Li et al (2005)
14	Shared authority between public and private sectors	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Corbett and Smith (2006), Zhang (2005), Abdul-Rashid et al (2006), Li et al (2005)
15	Favorable legal framework	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Jefferies et al (2002), Li et al (2005)
16	Government involvement by providing guarantees	Cheung et al (2012), Chan et al (2012), Solomon (2012), Li et al (2005), Tiong (1996), Zhang (2005), Suhaiza (2013)
17	Social support	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Jefferies et al (2002), Li et al (2005)
18	Political support	Cheung et al (2012), Chan et al (2012), Solomon (2012), Suhaiza (2013), Jefferies et al (2002), Jefferies et al (2002), Qiao et al (2001), Li et al (2005)

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will explain the methodology used to carry out this research. From the literature review of previous works, the principles and tools of critical success factor of PPP could be applied in the construction industry to improve the current efficiency. The main purpose of this study is to study the critical success factors that are consider important to the success of PPP construction project in Malaysia. The following sections comprehensively describe the systematic methods to accomplish the objectives of this study, i.e., conceptual research framework, survey population, questionnaire survey, expert survey, analysis tools, overall analysis process, and summary.

3.2 Conceptual research framework

Prior to considering the objective of re-exploring the principal factors essential to the success of the PPP construction project will help in gaining a better insight towards the industry, the current practice of the PPP in Malaysian construction industry should be investigated first. Then follow by the investigation of critical success factor of PPP in Malaysia construction industry. In order to gain the research purposes as mentioned in the previous chapter, a conceptual framework is drawn in step-by-step as shown in Figure 3.1.

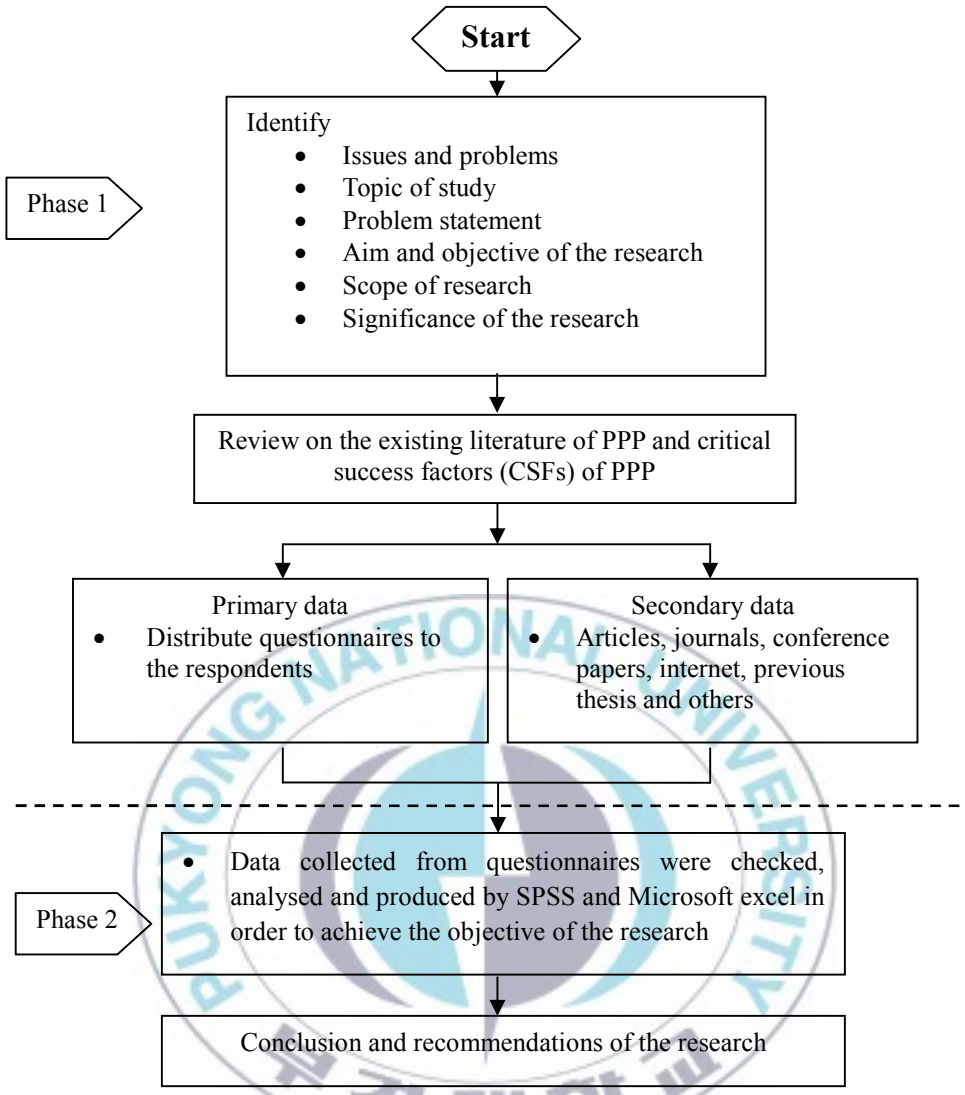

Figure 3.1 Conceptual frameworks for research problems

3.3 Survey population

A randomly selected group of targeted respondents consists of personnel who have a role in the Malaysia PPP construction process and resource management, and extensive site experiences were targeted as respondents for the sample survey. There is a wide spectrum of personnel with different position and job title. The public and private sectors in PPP projects will have

some common goals but they will also have several project and long-term aims that are very different. Therefore, the whole sample of respondents can be regrouped into two main categories as follows:

1. Public sector orientated group (Government): The officers with practical experience of PPP/PFI in relevant government departments will be targeted.

2. Private sector orientated group: The private sector group will covers industry practitioners including developers, consultants, contractors and investment bankers who are experienced in PPP schemes.

3.4 Questionnaire survey

Due to the unavailability of documented data of completed projects for research in Malaysia, a questionnaire survey has been decided to be employed. The role of questionnaire is to provide a standardized interview across all subjects. All respondents are asked the questions that are appropriate to them, and so that, when those questions are asked, they are always asked in the same way (Brace, 2004). The difficulty of this study is the far distance between the researcher and the targeted respondents. Therefore, the questionnaire has been considered as the most sufficient way of remote communication between them. The following principles are maintained during survey design and implementation:

- Pick up enough sample size considering the common response rate;
- Phrase and organize the questions in a clear and logical way;
- Avoid offensive or sensitive questions;

- Maintain the length of questions so that the respondent could finish them within a short time period (less than 20 minutes);
- Conduct pilot test the questionnaire by few respondents;
- Send the appropriate reminder to non-respondents.

The questionnaire survey can be basically divided into three steps: (1) Questionnaire design, (2) Questionnaire distribution, and (3) Data collection and preliminary analysis.

3.4.1 Questionnaire design

In this step, pilot test with experts group will be conducted to test the suitability of the questionnaire. Before conducting the pilot test, potential items were extracted from literature review and practitioners in professional forum. These works help to form a preliminary questionnaire.

It is decided to test this draft version of the questionnaire with experts. A group of three experts were invited to take part in the pilot test. All these experts are practitioners in the PPP. They have much experience in PPP construction engineering and management with at least ten years involved in construction field. The experts are asked to review the sufficiency and appropriateness of the problems and the structure of the questionnaire. After that, all items which are considered as potential problems for research objectives are finalized in the official questionnaire.

The contents of the questionnaire (see Appendix 1) for collecting data from respondents according to research objectives as follows:

- Part 1: General section concerning the respondent's backgrounds which identify the demographic features of the respondents which

included types of organization of respondents, designation of respondents, respondent's academic qualifications, and respondents' years of experience. And also investigate the current performance of PPP in Malaysian construction industry.

- Part 2: Investigate the CSF of PPP construction projects in Malaysia which respondents will be asked to rate the degree of importance of the 18 identified critical success factors in contribute to the success of the PPP construction project in Malaysia from their own perspective using a five-point Likert scale (1=least important and 5= most important).

- Part3: Further comments by the respondent

3.4.2 Questionnaire distribution

The main purpose of this research is to explore and re-examining the critical success factors (CSFs) necessary for adopting public private partnerships (PPPs) in Malaysian construction industry, in general, without referring to any specific PPP sector or project. A quantitative research approach is adopted for this research requiring the development and dissemination of a questionnaire survey. Due to the population of this research are virtually very difficult to be quantified as the main targeted respondents would include all personnel who have direct involvement in PPP construction field, the non-probability sampling methods will be adopted in this research instead of probability sampling.

In Malaysia, there is no organization recording or managing the PPP construction practitioners' profiles. Therefore, the researcher employs a self-

administered questionnaire distribution. The involved practitioners in the survey are identified through construction companies' websites and charters, professional forum, project case analyses, and researcher's personal relationship. It is noted that the brief information about the definition of critical success factor of PPP is described at the beginning section of the questionnaire. Two main methods for delivering the questionnaire are adopted in this study including electronic mailing and internet survey link. The area of sampling is in whole Malaysia. The first duration for collecting mass data is one month. After one month, a remind contact is conducted to people who do not reply the questionnaire. All responses after this due day will be discarded.

3.4.3 Preliminary analysis

The main purpose of this step is to collect and filter the feedbacks from the respondents. All the raw collected data will be put in a prepared sheet of Microsoft Excel for preliminary treatment. Questionnaires which are not fully answered by respondents will be discarded in this step. The data will be then classified into qualitative data and quantitative data. Moreover, they are also classified into data that need to be solved by inferential statistical tools or descriptive statistical tools.

The appropriate responses are then entered into the statistical software, namely Statistical Package for the Social Science (SPSS, version 18.0). This activity makes out the data set for this study. The detailed analysis results and discussion are presented in the following chapter.

3.5 Expert survey

The main purpose of expert's survey is to request for their help with the accuracy of the research problems. In detail, before conducting to collect mass data, referring the opinions of experts to certify the feasibility of the research problems is needed. Furthermore, the confirmation of experts to the results of analysis is also required in this study. These actions make the study more reliable and practical. They can also fill their comments at the end of the check sheet that they think these comments are helpful to the research findings.

3.6 Analysis tools

In this section, the statistical tools and techniques employed in the study will be briefly presented. Essentially, there are two kinds of statistical analysis include descriptive statistical analysis and inferential statistical analysis.

3.6.1 Descriptive analysis

Min and max

- *Min value (minimum)* is the smallest value of a data set. In this study, min value is the smallest value of the respondents' rating for each item in the questionnaire.
- *Max value (maximum)* is the largest value of a data set. In this study, min value is the largest value of the respondents' rating for each item in the questionnaire.

Mean

Mean (often represented by the Greek symbol μ, or the letter $\overline{X}$) is a measure of central tendency either of a probability or of the random variable characterized by that distribution. For a finite population, the population mean of a property is equal to the arithmetic mean of the given property while considering every member of the population. This parameter is used very frequently in descriptive statistical field. In this study, the mean value of one item is calculated by adding all respondents' ratings and then dividing by the number of the respondents for this item. The formula for calculating the mean is described as follows:

$$\mu = \frac{\sum_{i=1}^{n} X_i}{n} \qquad (3.1)$$

Where:

- X_i: rating of respondent i;
- n: sample size;
- μ: the mean of the data sample;

Standard deviation

Standard deviation (represented by the symbol sigma σ, and often abbreviated by SD) shows how much variation or dispersion exists from the mean, or expected value. A low standard deviation indicates that the data points tend to be very close to the mean, whereas high standard deviation indicates that the data points are spread out over a large range of values. In addition to expressing the variability of a population, standard deviation is commonly used to measure the confidence in statistical conclusions. The

standard deviation is the square root of its variance. The formula for calculating the standard deviation is expressed as follows:

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}\left(X_i - \bar{X}\right)^2}{n}} \qquad (3.2)$$

Where:

- X_i: rating of respondent i;
- $\bar{X}$: the mean of the data sample;
- n: sample size;
- σ: standard deviation.

3.6.2 Ranking

A ranking is a relationship between a set of items such that, for any two items, the first is either 'ranked higher than', 'rank lower than' or 'ranked equal to' the second. It is not necessarily a total order of objects because two different objects can have the same ranking. The rankings themselves are totally ordered.

In this study, mean value method is employed to analyze the data in the beginning. The rating of respondents according to five point Likert scale is used to compute mean score for each item. Items in each group are ranked based on their computed score. The rule of making ranking is "item having higher mean score is ranked higher than item having lower mean score".

3.6.3 T-test

A *t*-test is a statistical examination of the mean of two sets of data. A two-sample *t*-test examines whether two samples are significantly different from each other. It is commonly used when the variances of two normal distributions are unknown and when an experiment uses a small sample size. The test statistic in the *t*-test is known as the *t*-statistic. The *t*-test looks at the *t*-statistic, *t*-distribution and degrees of freedom to determine a *p*-value (probability) that can used to determine whether the means differ. The t-test is one of many hypothesis tests.

In this study, the *t*-test is employed to explore the difference between the means of relative importance of 18 CSFS from public and private sectors respectively. Therefore, the hypothesis can be stated as follows:

- Null hypothesis (H_0): There is no significant difference between the mean of predicted values (μ_p) and the mean of actual values (μ_a).
  - $\mu_p - \mu_a = 0$
- Alternative hypothesis (H_A): There is a significant difference between the mean of predicted values (μ_p) and the mean of actual values (μ_a).

$$\mu_p - \mu_a \neq 0$$

Before performing a two-sample *t*-test, the assumptions and conditions should be checked first. They are “independent assumption”, “randomization condition”, and “10% condition”. The p-value is then defined based on the t-value to make conclusion about the acceptance or rejection of the null hypothesis. The following formulas are used to determine t-value (De Veaux et al., 2009):

$$SE = \sqrt{\frac{\sigma_p^2}{n_p^2} + \frac{\sigma_a^2}{n_a^2}} \tag{3.3}$$

$$t = \frac{\mu_p - \mu_a}{SE} \tag{3.4}$$

$$df = \left(n_p - 1\right) + \left(n_a - 1\right) \tag{3.5}$$

Where:

- SE: standard error;
- σ_p, σ_a : standard deviation of predicted values and actual values, respectively;
- n_p, n_a: sample size of predicted values and actual values, respectively;
- μ_p, μ_a: mean of predicted values and actual values, respectively;
- t: the statistic of two samples;
- df: degree of freedom.

3.6.4 Factor analysis

In this study, there may be latent relationships between critical success factors. To explore the underlying relationships, factor analysis method is applied. Factor analysis (FA) is a statistical technique used to identify a relatively small number of individual factors that can be used to represent relationships among sets of many interrelated variables (Norusis, 2008). This technique is powerful to reduce and regroup the individual factors identified from a larger number to a smaller and more critical one by scores of the

responses (Lam et al., 2008).

Due to the large number of CSFs considered in this study it was important to define a set of commonalities. The number of individual factors would be required to represent that set of data was determined by examining the total percentage of variance explained by each individual factor.

There are three basic steps to conduct factor analysis (Robert, 2008):

1. Testing the applicability of factor analysis;
2. Extraction of initial factors;
3. Rotation of the extracted factors to a terminal solution.

The communality for a given variable can be interpreted as the proportion of variation in that variable explained by the extracted factors. The communalities of all problems included in factor model must be greater than 0.5 as rule of thumb to signify the reliability of the model. Factor analysis searches for such joint variations in response to unobserved latent variables. The observed variables are modeled as linear combinations of the potential factors, plus "error" terms. The information gained about the interdependencies between observed variables can be used later to reduce the set of variables in a dataset.

As factor analysis is based on correlations between measured variables, a correlation matrix containing the inter-correlation coefficients for the variables should be inspected. There is a need of sufficient significant correlation in data matrix to justify the application of factor analysis. The appropriateness of the model was evaluated before using FA in this research. The sampling adequacy using Kaiser-Meyer- Olkin (KM) and Barlett's test of sphericity can be used to test out the appropriateness (Fox and Skitmore,

2007).

The KMO statistic varies between 0 and 1. A value of 0 indicates that the sum of partial correlations is large relative to the sum of correlations, indicating diffusion in the pattern of correlations and, hence, FA would be inappropriate (Norusis, 2008). In contrast, a value close to 1 indicates that patterns of correlations are relatively compact and FA would yield distinct and reliable individual factors. The KMO value should be higher than the acceptable threshold of 0.5 for a satisfactory FA to proceed (Norusis, 2008). The acceptance level of KMO value is indicated in Table 3.1 (Field, 2005).

Table 3.1 Acceptance Level of KMO Value (Field 2005)

KMO value	Degree of common variance
0.90-1.00	Excellent
0.80-0.89	Good
0.70-0.79	Middling
0.60-0.69	Mediocre
0.50-0.59	Poo
0.00-0.49	"Forget it"

To reinforce the appropriateness of FA, the Barlett's test for sphericity is also carried out to highlight the presence of correlations among the variables. It is used to test the hypothesis that thebcorrelation matrix is an identity matrix, which indicates that there is no relationship among the items (Pett et al. 2003). When the value of the test statistic for sphericity is large and the associated significance level is small, the population correlation matrix is not an identity matrix (Statistical Package for Social Sciences (SPSS), 1997). Bartlett's test of sphericity which indicates whether the correlation matrix is not an identity

matrix must be significant at 0.05. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy should be over 0.7 (Sharma, 1996). According to latent root criterion, all extracted components must have eigenvalues larger than 1.0. As a rule of thumb, factor loadings less than 0.5 are suppressed and only problems with loading having larger than 0.5 are shown in the factor analysis result. The Varimax rotation method is employed in this study. And The Cronbach alpha reliability will be used to test the data collected for the critical factor analysis are reliable or not.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

The findings of questionnaire survey are reported in this chapter. It includes following sections: brief description of data collection, data analysis results, comparison with selected countries, discussion, and summary. Figure 4.1 shows the process of research in this chapter.

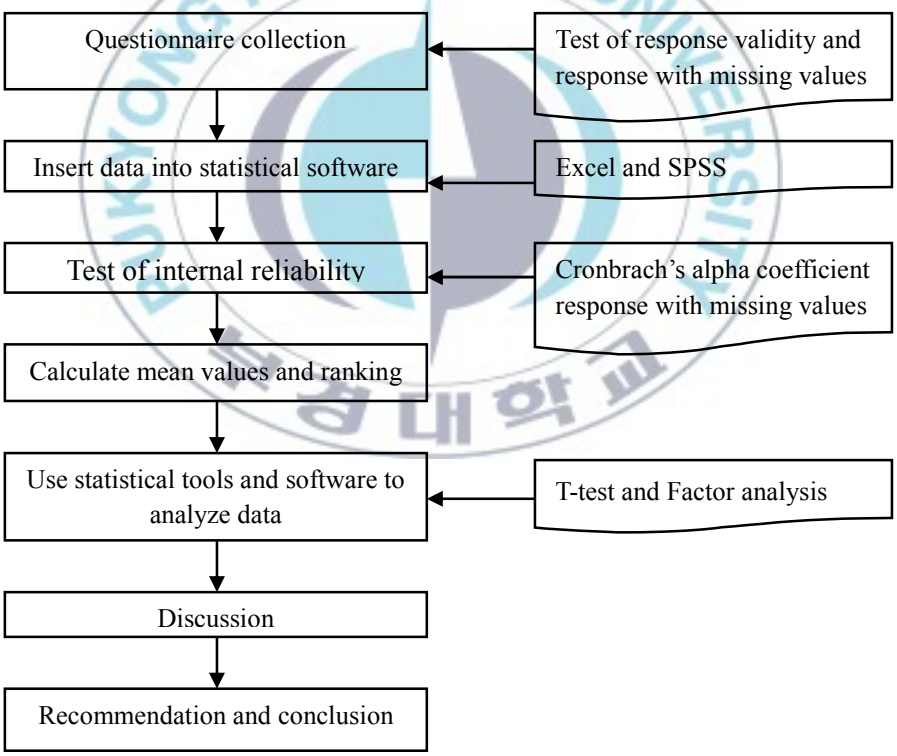

Figure 4.1 Flowchart of chapter's research process

4.2 Data collection

A questionnaire (in Malaysia) consisting of eighteen critical success factors Table 2.1 was designed. A total of 250 copies of the questionnaire have been distributed to the personnel in Malaysia. Responses were received from 60 professionals. After filtering these, only 55 responses were found to be usable. Thus, the effective rate of response in this study is 18%. This rate is higher than that of an earlier Institute for Public Policy Research (IPPR, 2000) survey dealing with PPP which achieved a response rate of 9.6% and similar to return rates achieved in comparable contemporary survey research reported in construction and project management journals. Table 4.1 illustrates that the total number of respondents was 55, with 25 (45.5%) engaged in the public sector and 30 (54.5%) engaged in the private sector.

Cronbach's alpha coefficients of internal consistency reliability test for frequency of responses for critical success factors is 0.8626. According to the commonly accepted rule of thumb, internal consistency is good when Cronbach's alpha coefficient is between 0.8 and 0.9. Therefore, the collected data are valid for carrying out the prospective analysis.

Table 4.1 Work field of respondents

Sector	Frequency	Percentage
Public	25	45.5
Private	30	54.5

4.3 Respondents profile

Table 4.2 illustrates that the respondents originated from different organizations of the government and private sector companies with various backgrounds. The majority of the respondents were either attached to the public institution (16 respondents) or serving the engineering firms (9 respondents).

Table 4.2 Organization of respondents

Type of Organization	Frequency	Percentage
Public institutions	16	29.1
Consulting firm	7	12.7
Architecture firm	1	1.8
Construction firm	8	14.5
Engineering firm	9	16.4
University	8	14.5
Others (E.g. Utility company)	6	10.9
Total	55	100

More than 27.3% of respondents in the survey are engineers. Other respondents consist of project managers/ planners (20%), lecturer/ professor (14.5%), architect (9.1%), managers (5.5%), and others (9.1%). The quite large proportion of top and functional personnel confirms the reliability of collected data for identifying critical success factor in Malaysian PPP projects. The detail of the work position of respondents is shown in Table 4.3.

Table 4.3 Work position of respondents

Position	Frequency	Percentage
Project manager/planner	11	20
Manager	3	5.5
Quantity surveyor	3	5.5
Engineer (Civil, mechanical etc.)	15	27.3
Architect	5	9.1
Builders	2	3.6
Supplier	1	1.8
Developer	1	1.8
Financier	1	1.8
Lecturer / Professor	8	14.5
Others	5	9.1
Total	55	100

The questionnaire respondents are comprised of experienced practitioners from the industry. As shown in Table 4.4, 87 percent of the respondents possessed more than five years of working experience with 36 percent of respondents having over sixteen years of industrial experience. In addition, approximately 94 percent of the respondents have participated in PPP projects before, with 54 percent of the total respondents having previously been involved with at least five PPP projects.

The proportion of respondents in terms of involvement in number of PPP projects are: none (5.5%), one project (12.7%), less than five projects (27.3%), between six to ten projects (30.9%), and more than or equal to eleven projects (23.6%). The results are shown in Table 4.4. Overall, the background of the respondents reflects their credibility in providing reliable information for the purpose of the present study.

Table 4.4 Characteristics of respondents

Survey Respondents' Characteristics	Frequency	Percentage
Years of experience		
Less than 5years	7	12.7
6-10years	13	23.6
11-15years	15	27.3
More than 16years	20	36.4
Number of PPP projects		
None	3	5.5
One	7	12.7
Less than 5	15	27.3
Between 6-10	17	30.9
More than 11	13	23.6

4.4 Survey Data Analysis

4.4.1 Overall respondents' perceptions on the importance of the critical success factors in PPP projects

The Malaysian version of PPP is fundamentally at a young stage and there is a need to ensure the ultimate objectives of PPP have been reflected. There is a need to investigate the performance of Malaysian PPP in construction industry. Therefore, all respondents from public and private sectors were asked to rate the degree of performance of Malaysian PPP. Table 4.5 shows approximately 93% of the respondents believed that there is a necessary need of change for Malaysian PPP in order to make sure that PPP can bring greater value for money from public sector resources.

Table 4.5 The degree of performance of PPP in Malaysian construction industry

Description	Answer	Frequency	Percentage
The need of change for Malaysian PPP	Yes	51	92.7
	No	4	7.3

Despite having some casualties, Malaysian PPP projects have been undertaken successfully, but the reasons for success are not entirely clear. For countries that are new at adopting PPP it is even more important for them to identify the success factors in order to maximize the advantages of this method and to reduce the risks for all concerned parties. Therefore, the factors that are considered critical to the success of PPP project implementation in Malaysia have become a subject for investigation. The relative importance of the 18 CSFs identified from the literature review was explored by means of Likert rating scale questions in the survey instrument. This type of scale has been found to be acceptable in other construction management research. The analysis of the survey response data produced mean importance values for the eighteen CSFs ranging from 4.53 to 3.36. Table 4.6 shows that thirteen factors scored mean values greater than 4.0, five factors displayed mean importance values between 3.0 and 4.0. Among the 18 CSFs in the survey, the top five critical success factors of overall respondents' perceptions were analyzed and discussed further.

Based on the overall respondents' result, the top five most critical success factors, in descending order of importance are: 1) Commitment and responsibility of public and private sectors; 2) Transparency in the procurement process; 3) Multi-benefit objectives; 4) Good governance; and 5) Project technical feasibility. The two factors that were ranked as least important for success PPP projects are social support and political support.

Table 4.6 Survey respondents' perceptions of the relative importance of CSFs in PPP projects

No.	Critical Success Factor	Public		Private		Overall	
		Mean	Rank	Mean	Rank	Mean	Rank
1	Commitment and responsibility of both public and private sectors	4.60	1	4.47	2	4.53	1
2	Transparency in the procurement process (process is made open and public)	4.48	2	4.50	1	4.49	2
3	Multi-benefit objectives	4.32	5	4.43	3	4.38	3
4	Good governance	4.40	4	4.30	7	4.35	4
5	Project technical feasibility	4.24	7	4.37	5	4.31	5
6	Well-organized public agency	4.28	6	4.30	9	4.29	6
7	Thorough and realistic cost/benefit assessment	4.24	8	4.33	6	4.29	7
8	Available financial market	4.12	11	4.40	4	4.27	8
9	Competitive procurement process (enough potential bidders in the process)	4.48	3	4.10	14	4.27	9
10	Sound economic policy	4.16	10	4.30	8	4.24	10
11	Appropriate risk allocation and risk sharing	4.16	9	4.27	10	4.22	11
12	Strong private consortium	4.04	14	4.27	11	4.16	12
13	Stable macro-economic environment including low inflation, stable exchange and interest rates	4.04	15	4.20	12	4.13	13
14	Shared authority between public and private sectors	4.08	12	3.93	15	4.00	14
15	Favorable legal framework	3.80	16	4.13	13	3.98	15
16	Government involvement by providing guarantees	4.04	13	3.83	17	3.93	16
17	Social support	3.72	17	3.83	16	3.78	17
18	Political support	3.36	18	3.37	18	3.36	18

The ‘commitment and responsibility of both public and private sectors’ was ranked first (Table 4.6: mean value of 4.53) as the most important critical success factor to ensure the success of PPP projects. Commitment is one of the fundamental principles in partnership because it is important to manage the relationship between partners, to contribute to the success of a PPP project. All parties should put in their best resources (financial, human, etc.) to the partnership project. Commitment should be established throughout all management levels, not only within the SPV established for the project, but also in the parent companies or steering boards (Li et al, 2005). Therefore, commitment from both parties is essential to ensure the attainment of the ultimate goals of the PPP projects. In addition, how such commitment can be assessed (or benchmarked) raises interesting issues for further research.

The ‘transparency in the procurement process’ is the second important CSF for implementing PPP project in Malaysia, as perceived by overall respondents with mean value of 4.49 as shown in Table 4.6. A transparent and efficient procurement process is essential in lowering the transaction costs and shortening the time in negotiation and completing the deal. Clear projects’ briefing and client requirements should help to achieve these in the bidding process. In most cases, competitive bidding solely on price may not help to secure a strong private consortium and obtain value for money for the public. The government should take a long-term view in seeking the right partner. Hence, transparency in tender processes, or negotiation, lies with the public client, private contractor and their advisers (NAO, 2001a), which further suggests that three features are important for transparency: good communication between the public and private contractor and their advisers; the private sector openly consulting with the public sector and its adviser, while keeping responsibility for all decisions; and the private sector establishing a clear basis for making decisions.

For public accountability, public agencies need to maintain fair, open, and transparent processes for the procurement of public projects. Consequently, governments may take several steps to maintain the accountability requirements by maintaining a disclosure practice that aims at disclosing as much information as possible without jeopardizing the competitive process, maintaining the government negotiating position and its ability to generate the best value for taxpayers' money, and protecting the private sector's sensitive information (PBC, 2005c). In Malaysia, normally government will take control on the selection of private company in the tendering process without publishing the important information to public and everything seems to be done in a closed process without considering any opinions or recommendations from the public. Transparency of process therefore requires effective communication that is open as much as possible to public scrutiny. Therefore, respondents believed that the government needs to make concerted efforts to make the public aware of the whole procurement process in the PPP projects in order to make the procurement process more transparent towards the general public. Indeed, an objective, competitive and fair transparent procurement process is conducive to the successful implementation of a PPP project; otherwise, legal battle would be invoked easily.

The third most important CSF for implementing PPP projects in Malaysia is the 'Multi-benefit objectives', as perceived by overall respondents in the survey with the mean value of 4.38 in Table 4.6. To develop a successful PPP/PFI project, all parties should agree on multi-benefit objectives. For a long-term partnership, PPP/PFI partners must understand and respect each other's goals. Typically, the objectives of the public sector party relate to reduction in financial restraints, avoiding public finance restriction, effective provision of public goods and services (detailed by specific project), the transfer of risk and the achievement of VFM. Private sector objectives are

typically profit generation and market penetration, diversification and technology and skills acquisition, while the objectives of the stakeholder user communities are to receive better services or to occupy a better environment. If there is no multi-benefit objectives exist in a PPP projects, government and private company need to re-examine the value of money for the good of final user. Otherwise, the ultimate objective of implementation of PPP cannot be achieved via transferring responsibility to finance and manage capital investment and services from the public sector to the private sector in return for lease charges that are commensurate with the quality of services and an amount sufficient to ensure commercial returns on investment (Azmi 2008).

As shown in Table 4.6, '*good governance'* is the fourth most necessary success factor for PPP projects in Malaysia. It is crucial to have good governance, as claimed by the United Nations Economic Commission for Europe (UNECE, 2007), because inefficiency in governance has led to the failure in the implementation of PPP in many countries. Therefore, good governance (Table 4.6: mean value 4.35) is important for the success of PPP/PFI in terms of developing sound economic policy and in administrating projects. Badshah (1998) emphasizes that good governance is essential to attract private sector participation in public services delivery. Mustafa (1999) put the policymakers at the apex of PPP/PFI structures, and recognizes their dominant influence in determining the development of PPP/PFI. The National Health Service (NHS, 1999) regards the Chief Executive as its highest level of PFI project governance, with ultimate responsibility for delivering the project. In UK PFI projects, most authorities and contractors consider that governance arrangements are working well (NAO, 2001b).

The fifth ranked factor is project technical feasibility with mean value of 4.31 in Table 4.6 because project technical feasibility is important to the

private sector for winning a PPP/PFI contract in the tendering process (Tiong, 1996). A SPV must demonstrate that the technical aspects of a proposal will satisfy all relevant regulatory requirements. Novel technology adds to the riskiness of projects. In an Australian PPP BOOT project for a new city tollway, commissioning difficulties with an advanced electronic tolling system delayed the opening of the road for several months. Government pressure (resulting from newspaper criticism) then forced the opening as a toll-free facility for a part of this period, thus significantly affecting project revenue streams until the defective tolling system could be rectified. On the same project, the need to find an effective solution to water leaks in a newly built tunnel delayed the opening of another section of the tollway and led to adverse reactions by potential users.

In Malaysia, there is a Smart tunnel project which applied PPP as the procurement of the project. The purpose of smart tunnel is built to discharge excess flood water but smart tunnel fail to function well as planned in preliminary design. This is due to the mistake in the project technical feasibility study at the design stage of PPP project. Therefore, technical assessment is important in the project technical feasibility of a PPP project because technical assessment involves the evaluation of designs and the planned facilities in a life cycle scenario including environmental impacts and safety and health considerations. Value engineering techniques can be deployed to improve benefit/cost profiles of potential technical solutions, particularly in the assessment of unsolicited or alternative technical proposals. In addition to strengths in formulating advantageous technical packages, the concessionaire should also have strong managerial capabilities, including leading role by a key enterprise or entrepreneur, workable project organization structure, good relationship with host government authorities, partnering skills,

rich experience in international PPP project management, multidisciplinary participants, and a strong project team.

According to the Asian Development Bank (ADB, 2008), the government, as a political decision maker, has to set out the case for PPP in a convincing and transparent manner and any political changes can hinder the PPP implementation. In other words, politics has a close relationship with the development and implementation of public policy (Li et al., 2005). Of the 18 CSFs '*political support',* with a mean value of 3.36 in Table 4.6, was ranked last by the respondents. The result does not mean that political support is not an important factor for successful PPP implementation in Malaysia, as this could be due to the fact that in Malaysia the current political situation is stable and clear government policy for implementation of PPP projects. In addition, the government is in support of PPP by established the Public Private Partnerships Unit (3PU) to manage the PPP projects and issued PPP/PFI Guidelines aiming to address some of the key attributes of the PPP/PFI model. Therefore, this success factor is being perceived as relatively less critical compare to the other critical success factor in the CSFs list.

4.4.2 Differences in the perceptions of the public and private sectors' respondents on the importance of critical success factors

In terms of the differences on the perceived importance of each factor by the public and private sectors, based on the mean score rankings, the results of the two parties are almost similar except for differences in the ranking for several factors. As illustrated in Table 4.6, the top five most critical factors, as perceived by the respondents from the public sector are: 1) commitment and responsibility of public and private sectors; 2) transparency procurement process; 3) competitive procurement process; 4) good governance; and 5) multi-benefit objectives. Whilst, for the private sector, the top five most important CSFs are 1) transparency procurement process; 2) commitment and responsibility of public and private sectors; 3) multi-benefit objectives; 4) available financial market; and 5) project technical feasibility.

Based on the result of Table 4.5, the ranking of the competitive procurement process factor was mostly different in between the public and private sector. The factor ‘competitive procurement process’ was ranked third by the public sector respondents but was ranked fourteen by the private sector respondents. The possible reason for the difference in the ranking between the two sectors might be because a competitive procurement process can help government in lowering the transactions cost and shortening the time in negotiation and completing the deal. In most cases, competitive bidding solely on price may not help to secure a strong private consortium. Hence, the public sector respondents perceived it as more important to ensure the success of PPP implementation than the private sector respondents.

Table 4.7 Results of independent two-sample t-test for statistically significant CSF of PPP as identified by public and private sector respondents

Critical Success Factor	F	T	Significance
Strong private consortium	1.197	-1.033	0.279
Sound economic policy	3.658	-0.613	0.061
Multi-benefit objectives	0.005	-0.612	0942
Government involvement by providing guarantees	2.318	0.711	0.134
Competitive procurement process	0.117	1.524	0.734
Commitment and responsibility of public and private sectors	1.787	0.710	0.187
Stable macro-economic environment including low inflation, stable exchange and interest rates	0.027	-0.547	0.871
Thorough and realistic cost/benefit assessment	0.150	-0.435	0.700
Social support	0.414	-0.426	0.523
Favorable legal framework	0.644	-1.392	0.426
Political support	1.403	-0.021	0.241
Good governance	0.282	0.413	0.598
Available financial market	0.195	-1.193	0.660
Transparency in the procurement process	0.259	-0.102	0.613
Well-organized public agency	0.000	-0.078	0.989
Project technical feasibility	0.472	-0.542	0.495
Shared authority between public and private sectors	0.364	0.583	0.549
Appropriate risk allocation and risk sharing	1.496	-0.483	0.227

The next stage of the analysis was to test whether there is any substantial agreement amongst the respondents from the two groups, which is determined by using the SPSS statistical package. An independent two-sample t-test was undertaken to examine whether there was any significant difference in mean

value responses between the two respondent groups for each of the 18 CSFs discussed. When the calculated significance level is below the allowable value of 0.05 for a certain CSF, this mean there is a large variation is detected in between the views of the respondents from public and private sector. A significance level below 0.05 was used because this degree of significance has been commonly used by other researchers in similar studies. Based on the results in Table 4.7, the findings indicate that there is no significant difference in the perceptions of public and private sectors pertaining to the success factors of PPP implementation in Malaysia. This means that both group of respondents had similar opinions and expectation on the importance of each of the eighteen critical success factors in Malaysian PPP projects even the rankings of many factors were different between the public and private sectors.

4.4.3 Comparison between Countries of the Top Five Most Important CSFs for PPP Implementation

Table 4.8 depicts the top five CSFs of five different countries including Malaysia. Generally, the results show many differences in the rankings of the CSFs for PPP implementation, as perceived by the respondents in different countries. For instance, the factor *'transparency in the procurement process'* was one of the top five CSFs for PPP implementation in Malaysia, as perceived by the respondents, however, for Hong Kong, China Australia and the United Kingdom the factor was ranked medium level in terms of its importance. This finding has implied that the respondents of these countries were not particularly concerned about their existing procurement process, which is already well established to handle PPP projects.

Table 4.8 Comparison between Countries Concerning the Top Five CSFs for PPP Implementation

No	Top Five CSFs of Malaysia	Corresponding Ranking of the Top Five CSFs for Malaysia			
		Hong Kong (Cheung at el, 2012)	China (Chan at el, 2010)	Australia (Cheung at el, 2012)	UK (Li, 2003)
1	Commitment and responsibility of public and private sectors	2	3	1	4
2	Transparency in the procurement process	11	7	14	10
3	Multi-benefit objectives	16	6	10	14
4	Good governance	10	17	4	8
5	Project technical feasibility	15	15	5	6

Similar to the respondents in Malaysia, the factor *'Multi-benefit objectives'* was also ranked high by the respondents of China, but it was ranked lower by the respondents in Hong Kong, Australia and UK. This is because China government does not make good efforts to select a PPP project with good objectives. Instead, the respondents of Hong Kong, Australia and UK were not concern about the matter because these countries adopted PPP procurement system longer than Malaysia and China and there are many existing research that had been carried out in order to improve the selection of PPP proposal with multi-benefit objective. The factors *'Good governance'* and *'Project technical feasibility* were in the top five ranking in Malaysia, Australia and UK but in the lower ranking (i.e. tenth, fifteen and sixteen rankings, respectively) for Hong Kong and China. This is because Malaysian

government adopted the similar background and policy of UK and Australia PPP procurement at the early stage of implementation of Malaysian PPP.

Despite the differences between the countries concerning the importance of the CSFs, the factor *'commitment and responsibility of public and private sector'* is in the top rank for all four countries with Malaysia ranked it first, Hong Kong and the United Kingdom ranking it second and third while Australia ranked it fourth. As emphasized earlier, due to the structure and nature of PPP, involves both public and private sectors for a long-term contractual period, therefore, it is crucial for both sectors to be fully committed and responsible for the works (National Audit Office, 2001).

The differences in the ranking of the CSFs between countries reflect the unique nature of PPP implementation in different countries. In other words, although PPP has been implemented worldwide with similar principles and objectives, the nature and characteristics of PPP vary between countries because each country has particular unique environment in term of political, social, economy and procurement process. Hence, the findings imply that despite the needs for the government to learn the lessons concerning PPP implementation from other countries, the fact that the PPP success factors are unique to each country means that any policy, rule or regulation pertaining to PPP should be tailored to suit the practice of the specific country. Besides, the differences in the ranking of the CSFs between countries also reflect the possible weakness or loophole of current Malaysian PPP procurement in construction industry. Therefore, Malaysian government should establish ideal Malaysian version PPP procurement and the Malaysian PPP procurement should be constantly reviewed and revised by the Malaysian government to improve the present practice of PPP implementation to ensure the achievement of its ultimate objectives.

4.5 Factor analysis of CSFs for PPP projects

Factor analysis is used to identify a relatively small number of factor groupings that can be used to represent relationships among sets of many inter-related variables (Kleinbaum et al., 1988; Norusis, 1992). This technique was applied to the survey data to explore the groupings that might exist among the CSFs. A correlation matrix of 18 community variables from the research survey data was calculated.

Various tests were required to examine the appropriateness of FA for the extraction. The KMO measure of sampling adequacy and Barlett's test of sphericity for the extraction individual factors were conducted in this research. The KMO value of this research is 0.694 which shows a moderate degree of common variance (Table 4.9).

Table 4.9 Results of KMO and Barlett's Test for the CSFs of PPP

KMO measure of sampling adequacy		0.694
Bartlett's test of sphericity	Approximate chi-square	567.732
	Degree of Freedom	153
	Significance	0.000

The value of the test statistic for Barlett's sphericity is large (chi-square value=567.732: Table 4.9) and the associated significance level is small (*p*-value=0.000: Table 4.9), implying that the population correlation matrix is not an identity matrix. As the requirement of KMO value and the Barlett's test of sphericity are both met, it can be concluded that FA was appropriate for this research.

Principal component analysis produced a six-factor solution with eigenvalues greater than 1.000, explaining 77.19% of the variance, as shown

in Table 4.10. The remaining factors together accounted for 22.81% of the variance.

Table 4.10 Total rotated factor variance explained for critical success factors for PPP projects

Component	Initial Eigenvalues			Rotation Sums of Squared Loading		
	Total	%of variance	Cumulative %	Total	% of variance	Cumulative %
1	6.261	34.782	34.782	4.083	22.683	22.683
2	2.240	12.447	47.229	3.541	19.674	42.357
3	1.658	9.210	56.439	1.697	9.426	51.783
4	1.434	7.968	64.407	1.606	8.923	60.706
5	1.267	7.039	71.445	1.602	8.902	69.608
6	1.033	5.740	77.186	1.364	7.578	77.186
7	0.707	3.897	81.082			
8	0.634	3.524	84.606			
9	0.549	3.049	87.655			
10	0.507	2.819	90.474			
11	0.413	2.296	92.770			
12	0.322	1.790	94.560			
13	0.292	1.622	96.182			
14	0.220	1.224	97.406			
15	0.168	0.935	98.341			
16	0.147	0.815	99.156			
17	0.100	0.557	99.713			
18	0.052	0.287	100.000			

The factor grouping based on varimax rotation is shown in Table 4.11. Each variable belongs to only one of the factors, with the loading on each factor exceeding 0.50. It is noticed that the CSF appropriate risk allocation and risk sharing does not belong to any of the factor groupings, and therefore cannot be grouped in this way.

Table 4.11 Rotated factor matrix (loading) of critical success factors for PPP

Factor Component	Component					
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Available financial market	0.843					
Project technical feasibility	0.798					
Favourable legal framework	0.778					
Strong private consortium	0.747					
Well-organized public agency	0.729					
Stable macro-economic environment	0.537					
Good governance		0.857				
Thorough and realistic cost/benefit assessment		0.853				
Social support		0.740				
Shared authority between public and private sectors		0.644				
Government involvement by providing guarantees			0.828			
Commitment and responsibility of public and private sectors			0.670			
Competitive procurement process				0.730		
Sound economic policy				0.668		
Political support					0.880	
Transparency in the procurement process					0.530	
Multi-benefit objectives						0.874
Appropriate risk allocation and risk sharing						

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 15 iterations.

In order to facilitate the explanation of the results of FA, it is necessary to assign an identifiable, collective label to the groups of individual factors of high correlation coefficients, as each of the underlying grouped factors is an aggregation of individual factors (Sato, 2005). It is however stressed that the suggested label is subjective and other researchers may use a different label. The factor analysis shows that the residual 17 CSFs can be grouped into six principal factors and be interpreted as follows:

- Factor grouping 1 represents project implementability.
- Factor grouping 2 represents shared responsibility between public and private sectors.
- Factor grouping 3 represents government guarantee.
- Factor grouping 4 represents efficient procurement process.
- Factor grouping 5 represents political support.
- Factor grouping 6 represents multi-benefit objectives.

The meanings of the six underlying grouped CSFs of PPP in this study are interpreted as follows.

4.5.1 Factor Grouping 1- Project Implementability

This principal factor is responsible for 22.68% (Table 4.10) of the total variances of critical success factors. There are five CSF components in the project implementability group:

- Available financial market
- Project technical feasibility
- Favourable legal framework
- Strong private consortium
- Well-organized public agency
- Stable macro-economic environment

These CFSs are all related to ensuring a good foundation for the project's implementability. The CSFs under this underlying group cover financial market issues, technical issues, legal issues and economic issues in order to adopting PPP. The first CSF in this group is available financial market (Table 4.11: significance 0.0.843). Many researchers have found out that project financing is a key factor for private sector investment in public infrastructure projects. The availability of an efficient and mature financial market with the benefits of low financing costs and a diversified range of financial products would be an incentive for private sector taking up PPP projects. The CSF with the next highest factor loading is project technical feasibility, which has a significance of 0.798 in Table 4.10. Traditionally, technical issues are among the most important considerations in a project feasibility study. When considering PPP procurement options, it is important to review the associated technical problems. In particular, the private contractor needs to ensure that

any engineering uncertainties are resolved. A special purpose vehicle (SPV) must demonstrates that the technical aspects of a proposal will satisfy all relevant regulatory requirements.

Third CSF is a favourable legal framework (Table 4.11: significance 0.778). A favourable legal framework allows a PPP/PFI project to be developed without undue legal restriction on the private sector involvement. An appropriate risk framework should guarantees the legal status for project implementation. As mentioned by the National Treasury Public Private Partnership Unit of South Africa (2007), an independent, fair, and efficient legal framework is a key factor for successful PPP project implementation. Sufficient legal resources at reasonable costs should be available to deal with the amount of legal structuring and documentation required. A transparent and stable legal framework should help to make the contracts and agreements bankable. An adequate dispute resolution system should help to ensure stability in the PPP arrangements. Appropriate governing rules, regulations, and reference manuals related to PPP have been well-established in some developed countries (e.g., U.K., Australia, Canada, South Africa, etc.) to facilitate the effective application of PPP procurement approach.

A strong private consortium is fourth loading component in the group (Table 4.11: significance 0.743). This relates to project implementability in the sense that where a project has the right actors (stakeholders), with common goals, the project is most likely to be implemented successfully. The government in contracting out the PPP projects should ensure that the parties in the private sector consortium are sufficiently competent and financially capable of taking up the projects. This suggests that private companies should explore other participants' strengths and weaknesses and, where appropriate, join together to form a consortia capable of synergizing and exploiting their

individual strengths. Good relationship among partners is also critical because they all bear relevant risks and benefits from the cooperation.

The fifth CSF in this group is well-organized public agency (Table 4.11: significance 0.729). A well-organized public agency to negotiate on behalf of the public body is essential for a PPP/PFI project. In project procurement generally, the team, including project owner, project sponsor and project manager, should possess essential management ability and technical ability. It might be appropriate to seek external skills and experience from competent advisers to complement public sector skills. However, the cost of such advice has to be added into the financial assessment of the project at the outset. Li et al. (2005) described that effective procurement cannot be separated from the actors (stakeholders). This supports the institutional structure for a PPP project where policy makers, government departments, and their agency are fundamental for successful PPP implementation.

The CSF with the lowest factor loading in this group is stable macro-economic environment with significance of 0.537 (Table 4.11). Li et al. (2005) mentioned that, for successful PPP project implementation, governments must ensure that economic conditions are favourable. A stable macro-economic environment, where the market exhibits reasonable certainty and market risk is correspondingly low, does a great deal (e.g. low inflation, stable exchange and interest rates) to reduce risks for private investors. The government can help to create and maintain a stable economic environment by manipulating economic policy levers to ensure stable prices and by maintaining a balanced budget for PPP projects.

4.5.2 Factor Grouping 2- Shared Responsibility between Public and Private Sectors

This principal factor is responsible for 19.67% (Table 4.10) of the total variances of critical success factors. This underlying group consists of four CSFs including:

- Good governance
- Thorough and realistic cost/benefit assessment
- Social support
- Shared authority between public and private sectors

The CSFs under this underlying group mainly focus on the main characteristic of government in PPP and sharing of responsibilities and authority between the main parties in a PPP arrangement. In addition, this group also covers those CSFs related to the social support and assessment of benefits.

The first CSF in this group is good governance (Table 4.11: significance 0.857). Good governance is essential to attract private sector participation in public services delivery. A committed and knowledgeable public client will be able to coordinate with the private parties much more effectively. The public client will also act as a monitoring authority to ensure that the private consortium acts according to the agreement. The second CSF in this group is thorough and realistic assessment of the cost and benefits (Table 4.11: significance 0.853). For this CSF, Li et al. (2005) also explained that before a project is subjected to the procurement process, the public client should ensure that all the potential options that are beneficial to the government and end-users are considered as part of the complete project feasibility study. The

public and private sectors have different views on project financial analysis. Of great importance is how uncertainty is to be treated in such assessment, as in the project development stage both costs and benefits are derived from forecasts projected over anything from three to 30 years. Although much of this assessment is treated as commercial-inconfidence, some forecasts may need to withstand open public scrutiny.

To conduct PPP/PFI procurement, social support is an important component (Table 4.11: significance 0.740) because social support is based on the public acceptance of the concept of private provision. Public opinion against PPP/PFI could slow, or even prevent, the project development. Social support therefore helps a PPP/PFI development and procurement process to go smoothly, particularly at the earlier stages, such as during land acquisition.

Shared authority between the public and private sector is another important component related to effective procurement (Table 4.11: significance 0.644) because clearly demarcated shared authority and responsibility are important in maintaining the type of long-term alliance desirable in PPP projects. This suggests that the public and private sector should respect each other when carrying out negotiations during the procurement process. It is important that the authority of each party are appropriately defined and shared. In order for PPPs to work there must be a partnership in place with well defines responsibility in authority.

4.5.3 Factor Grouping 3- Government Guarantee

Government guarantee is important in the early stage of PPP/PFI evolution. It accounts for 9.43% (Table 4.10) of the total variances in the factor analysis of CSFs. There are two components in this principal factor: government involvement by providing a guarantee; and commitment and responsibility of public and private sectors. Higher loading is associated with

government involvement by providing a guarantee (Table 4.11: significance 0.828). In the current Malaysian PPP situation, the private sector does not yet have full confidence in PPP procurement and is subsequently demanding revenue guarantees or firmly committed policies from government to ensure that investments are protected. Therefore, governments can provide PPP/PFI project guarantees in a variety of ways. Subsidy guarantees for housing, agriculture, students, exports and public corporations tend to dominate the picture in countries, especially where prices or user charges have been set too low and the government is not willing to raise them, nor allow them to be raised by the private sector provider.

The ideal guarantees from government tend to lower the risk taken by the concessionaire, support the cash flows of the concessionaire, and raise the level of confidence of investors and lenders. However, in developed countries, the government would not provide such a direct and attractive package to private investors. The guarantee from government must not only cover the revenue issues and government should guarantee provide the flexible policy and strong support to private company in solving the related problem in PPP projects. Under PPP contracts the government should be concerned that the assets are procured and services are delivered on-time with good quality and meet the pre-agreed service benchmarks or requirements throughout the life of the contract.

However, the government should be less concerned with “how” these are achieved and should not impose undue restrictions and constraints on private sector participants. The government should focus on industry and service regulation; should be flexible in adopting innovations and new technology; and should provide strong support and make incentive payments to the private sector where appropriate. On the other hand, the government should retain

controls in case of default and be prepared to step in and re-provide the service if necessary.

Lower loading is associated with commitment and responsibility of public and private sectors (Table 4.11: significance 0.670). The attitude of the actors (or stakeholders) in a PPP/PFI project has an influence on the quality of outputs. Thus 'soft' factors such as stakeholder relationships and stakeholder management must also be considered because commitment is one of the fundamental principles in partnership. It is important to manage the relationship in order to secure a successful PFI project. All parties should commit their best resources (financial, human, etc.) to the partnership project. Commitment should be established throughout all management levels, not only within the SPV established for the project, but also in the parent companies or steering boards (Li et al, 2005). Therefore, commitment from both parties is essential to ensure the attainment of the ultimate goals of the PPP projects.

4.5.4 Factor Grouping 4- Efficient Procurement Process

This factor group accounts for 8.92% (Table 4.10) of the total variability between critical success factors. There are two CSFs under this underlying group. These CSFs are related to the procurement process of PPP projects and they included competitive procurement process (enough potential bidders in the process) and sound economic policy. Higher loading is associated with competitive procurement process (Table 4.11: significance 0.730). Hall (1998) insists that value for money (VFM) gains depend on the existence of a competitive bidding process. The National Audit Office (NAO, 1999) notes that government departments should establish three key conditions for successful competitive tender: a good tender list of firms invited to bid; a clear

specification in requirements; and competitive tension maintained throughout the procurement process. For instance, some Malaysian PPP projects involved direct negotiation with the relevant parties, which eliminating the competition in tendering. This negotiation method in tendering might increase the risk of financial and construction for all respective parties in the PPP projects. Thus, there is a need of third party independent checking group for close monitoring on the negotiation process in tendering to make sure the ultimate objective of PPP procurement is achieve as planned.

The CSF with the lower factor loading in this group is sound economic policy with 0.668 (Table 4.11). Governments should adopt economic policies to maintain a stable and growing economic environment, where the private sector can operate with confidence. The economic policy affects the credibility of a price regimen and trust in the convertibility of the currency, which is essential for foreign investors. For projects where the major source of revenue to the private sector is generated from direct tariffs levied on users, there are revenue risks that can go beyond the control of the private sector such as, for example, future usage level and permitted tariff charges. There may also be unforeseen risks during the course of project life. To ensure project economic viability, the government may consider some forms of government guarantees, joint investment funding, or supplemental periodic service payments to allow the private sector cover the project costs and earn reasonable profits and investment returns. At the same time, the government should take due consideration of private sector's profitability requirements in order to have stable arrangements in PPP projects. Alternative sources of income and financing such as property development opportunities along the railway can be sought to bridge the funding gap for private investors.

4.5.5 Factor Grouping 5- Political Support

This factor group accounts for 8.90% (Table 4.10) of the total variability between critical success factors. Similar to factor grouping 2, this underlying group also consists of two CSFs including political support and transparency in the procurement process (process is made open and public). The CSFs in this group are related to the support given to PPP projects by government and also the procurement process that handle by government. The factor loadings for the CSFs political support and transparency in the procurement are 0.880 and 0.530 (Table 4.11) respectively. Politics has a close relationship with the development and implementation of public policy. A positive political attitude towards the private sector involved in an infrastructure project would support the growth of PPP. On the other hand, inadequate political support would pose a great risk to PPP projects. Successful PPP implementation requires a stable political environment, which in turn relies on the stability and capability of the host government. Political issues that go beyond private sector's domain should be handled by the government. In the event that the private sector participants are affected, they should be adequately compensated. Unstable political environments has resulted in some failed rail projects (e.g., frequent change in government premiers in Bangkok leading to the cancellation of many new public infrastructure projects originally procured under the PPP approach).

Besides, government should provides support in maintaining the transparency of whole procurement process by making sure the procurement process is open to the public. Transparency in procurement process enhances project value for money because a transparent procurement process is essential in lowering the transaction costs and shortening the time in negotiation and completing the deal. Clear projects' briefing and client

requirements should help to achieve these in the bidding process. Transparency in tender processes, or negotiation, lies with the public client, private contractor and their advisers, which further suggests that three features are important for transparency: good communication between the public and private contractor and their advisers; the private sector openly consulting with the public sector and its adviser, while keeping responsibility for all decisions; and the private sector establishing a clear basis for making decisions. Transparency of process therefore requires effective communication that is open as far as possible to public scrutiny.

4.5.6 Factor Grouping 6- Multi-benefit objectives

This factor group accounts for 7.58% (Table 4.10) of the total variability between critical success factors. There is only one CSF component under this factor grouping: multi-benefit objectives (Table 5.11: significance 0.874). To develop a successful PPP/PFI project, all parties should agree on multi-benefit objectives. For a long-term partnership, PPP/PFI partners must understand and respect each other's goals. Typically, the objectives of the public sector party relate to reduction in financial restraints, avoiding public finance restriction, effective provision of public goods and services (detailed by specific project), the transfer of risk and the achievement of VFM. Private sector objectives are typically profit generation and market penetration, diversification and technology and skills acquisition, while the objectives of the stakeholder user communities are to receive better services or to occupy a better environment. Apart from the direct objectives in achieving public services, a PPP project needs to consider the private contractor's business objectives.

4.5.7 Relationship of the Underlying Grouped CSFs of PPP

A relationship and order between the identified underlying grouped factors was observed. Figure 4.1 illustrates that the groups of CSFs should be considered in a certain order. This order is unrelated to the relative importance of the individual factors considered, but more to do with the corresponding phase of the project life cycle for these individual factors to be considered.

The first underlying group that should be considered is factor grouping 6- multi-benefit objectives because the individual factor in this group is related to the issue of project objectives that involved all parties in PPP projects at preliminary stage of PPP procurement. All objectives and benefit of PPP for all parties of PPP must be well defined and PPP partners must understand and respect each other's goals. The second underlying grouped factor that should be considered is factor grouping 4- efficient procurement processes. The individual factors within this group are all related to the procurement process, so should be considered early on in a project. These individual factors should even be considered before the procurement process to ensure that they can be taken into action well in advance.

The next underlying grouped factor that should be considered is factor grouping 2- shared responsibilities between public and private sectors. The individual factors within this group are all related to the negotiation stage between the public and private parties. These individual factors would therefore need to be considered before and during the first consultation between these parties to ensure that they are taken into consideration. The fourth underlying grouped factor to be considered is factor grouping 3 government control guarantee. It is anticipated that during the negotiation stage the private sector may request the government for certain guarantees to

lower their risks or the government may consider to offer certain guarantees in order to attract the private sector. Either way this underlying grouped factor should be considered next in line.

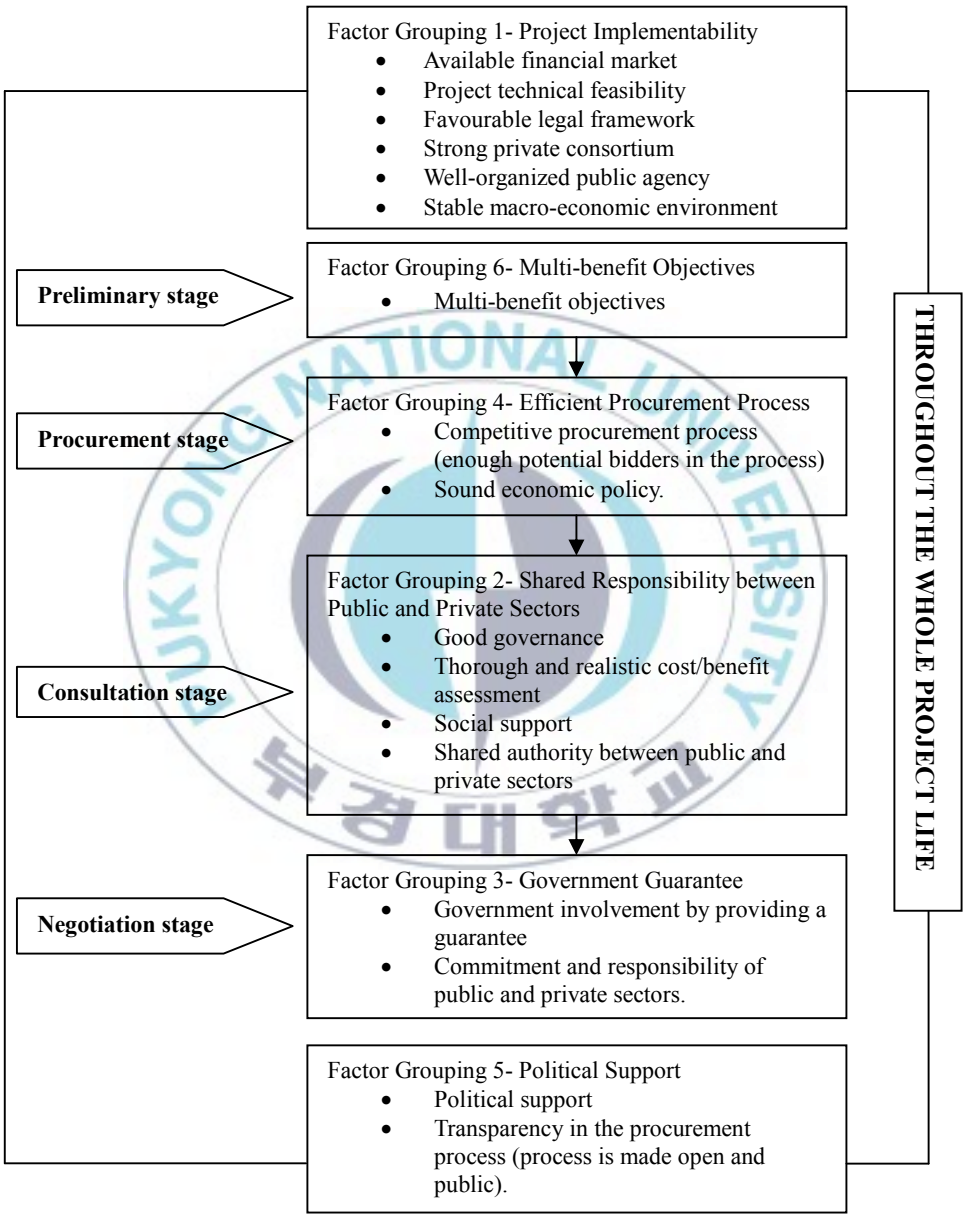

Figure 4.2 Diagram showing the relationship between the six factor groupings in Malaysia

Among the six underlying grouped factors there are two remaining including factor grouping 1- project implementability and factor grouping- 5 political supports. The individual factors within these groups are related to the general environment of PPP hence are important and should be considered continuously throughout the project life. Each factor grouping represented different important elements in each stage of PPP project life, hence government can revise their current PPP procurement system by referring to these important elements and form an ideal Malaysian PPP procurement system that relates to the specific characteristics or conditions of an industry.

The CSF of appropriate risk allocation and risk sharing lies outside these principal factor groupings for PPP projects in the Malaysian construction industry. The result does not mean that appropriate risk allocation and risk sharing is not an important factor for successful PPP implementation in Malaysia, as this could be due to the fact that in Malaysia the current practice of risk allocation and sharing is stable and the government is putting effort in monitor this CSF. Therefore, this success factor is being perceived as relatively less critical (Table 4.6: mean value of 4.22). However, this CSF is still related to the unique characteristic of PPP because PPP procurement is allocating each risk to the party best able to manage it. In theory, this reduces individual risk premiums and the overall cost of the project, because the party in the best position to manage a particular risk should be able to do so at the lowest price. A strategic approach to risk allocation is therefore essential during project development. Hence, appropriate risk allocation and risk sharing is important and should be considered continuously throughout each stage of the project life.

In addition, explanation and the important of each element in particular grouping were discussed in previous section. Therefore, corresponding

effective strategies of PPP projects can be generated based on these identified CSFs grouping in project life and also can be used in accelerating the success of delivering future PPP projects.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

Governments believe that PPP procurement can provide a wide variety of net benefits for society, including: enhanced government capacity; innovation in delivering public services; reduction in the cost and time of project implementation; and transferring of major risks to the private sector, in order to secure value for money for taxpayers. The essence of PPP can be summarized as a long-term contract arrangement between private and public sector entities. On the basis of input and output sharing, the private sector carries out the delivery of a service or project development. Many factors contribute to the success of PPP projects, and it is possible to rank the relative importance of these factors. Therefore, the present study examined the critical success factors for PPP implementation in Malaysia.

Mean score values of response data from survey respondents have been used to rank the relative importance of a catalogue of eighteen critical success factors in the Malaysian PPP environment. Five factors- commitment and responsibility of public and private sectors, transparency in procurement process, multi-benefit objectives, good governance and project technical feasibility- emerge as being most important in the development of successful Malaysian PPP projects.

Thereafter, in descending order of importance, the ranking of the remaining CSFs is: a well-organized public agency; thorough and realistic cost/benefit assessment; available financial market; competitive procurement process; sound economic policy; appropriate risk allocation and risk sharing; a strong private consortium; stable macro-economic environment; a favourable legal framework; a transparent procurement process; shared authority between public and private sector; favourable legal framework and government involvement by providing guarantee. Two factors are regarded as less important for project success: social support and political support. The weakness of Malaysian PPP can be identified by referring to the result of CSF which was perceived by overall respondents from public and private sectors. Some amendment definitely needs to be done to avoid the Malaysian PPP to be ambiguous, incomplete and incomprehensive. This can be done by revising the Malaysian PPP procurement system based on the ranking of CSFs in the list.

From the analysis of ranking based on public and private sector groups, the results are mixed. While the majority of the success factors were ranked differently by the two sectors, there were a few factors of similar ranking for both groups. Despite the difference in the ranking for each of the 18 factors, the statistical test revealed that there is no significant difference in the perceptions of public and private sectors pertaining to the success factors of PPP implementation in Malaysia. This means that both group of respondents had similar opinions and expectation on the importance of each of the eighteen critical success factors in Malaysian PPP projects even the rankings of many factors were different between the public and private sectors.

The differences in the ranking of the CSFs between countries reflect the unique nature of PPP implementation in different countries. In other words,

although PPP has been implemented worldwide, the nature and characteristics of PPP vary between countries. The findings imply that despite the needs for the government to learn the lessons concerning PPP implementation from other countries, the fact that the PPP success factors are unique to each country means that any policy, rule or regulation pertaining to PPP should be tailored to suit the practice of the specific country. In addition to that, CSFs often will change as the industry's environment changes, as the company's position within an industry change, or as particular problem or opportunity arises for that industry.

Given that all the factors are nominally regarded as critical in the literature, factor analysis was used to determine the principal success factor groupings that underlie project procurement. The findings showed that six underlying grouped factors accounting for 77% of the variance in responses were derived from the 18 CSFs. These six factor groupings are project implementability, shared responsibility between public and private sector, government guarantee, efficient procurement process, political support and multi-benefit objectives. All loadings for the CSFs were greater than 0.5 indicating a high absolute value for each. It is noticed that the CSF appropriate risk allocation and risk sharing does not belong to any of the factor groupings, and therefore cannot be grouped in this way. The factor loading also showed that the underlying grouped factor is positively correlated to the criticality of individual factors of PPP and vice versa.

The six factor groupings therefore represent the basic elements of CSFs for PPP project development, and should always be considered by public sector sponsors in informing and shaping their PPP/PFI policy development, and by private sector concessionaires in managing their projects. The CSF of appropriate risk allocation and risk sharing lies outside these principal factor

groupings for PPP projects in the Malaysian construction industry. The result does not mean that appropriate risk allocation and risk sharing is not an important factor for successful PPP implementation in Malaysia, as this could be due to the fact that in Malaysia the current practice of risk allocation and sharing is stable and the government is putting effort in monitoring this CSF, which means that this success factor is being perceived as relatively less critical. However, this CSF is still related to the general environment of PPP hence are important and should be considered continuously throughout the project life.

Since PPP is at a germinating stage of development in Malaysia, a study of the CSFs should enable a better understanding of the important individual factors affecting the success or otherwise of PPP projects. It should pave the way for enhanced decision making in the choice of suitable projects for which the CSFs can be ensured or controlled in some way and in the effective management of those already embarked upon. Corresponding effective strategies based on those CSFs identified can also be generated for successfully delivering future PPP projects for accelerated excellence. It is believed that this paper has helped to depict the perspectives of public and private sectors' PPP experts in their evaluation of CSFs for PPP projects in Malaysia. Nevertheless, readers must take into consideration that there will be continuous evolution of the PPP project procurement process from the time of data collection and the time of research publication.

5.2 Limitation and future research

This study is not without limitations. First, given the unique characteristics of PPP of a particular country, simply adopting success factors of other countries may not provide the exclusive list of critical success factors

for PPP implementation in Malaysia. Therefore, future studies may want to consider other CSFs that are relevant in the context of Malaysia by interviewing PPP experts in Malaysia from both the public and the private sectors.

Second, with the complex nature of individual PPP projects, using a questionnaire to identify the CSFs for PPP projects in general may not be the best method. Hence, future research may want to investigate the CSFs for a specific PPP sector or project using the case study method. Despite its limitations, this present study offers some insights and useful information for the government and private sector providers concerning the important factors that need to be emphasized in ensuring the successful implementation of PPP in Malaysia.

5.3 Recommendations

This research states that Malaysian PPP still have weakness after the investigation of critical success factors and the Malaysian PPP needs urgent amendment to improve the quality of the Malaysian PPP procurement in order to achieve the ultimate objective of PPP principles. Thus, some amendment definitely needs to be done to avoid the Malaysian PPP to be ambiguous, incomplete and incomprehensive. This can be done by revising the Malaysian PPP procurement system based on the existing type of project and dispute possibilities. It means producing an efficient Malaysian PPP procurement system which caters for specific need of the PPP project based on the unique and specific PPP environment in Malaysia. This will then slowly reduce the problem occurrence caused by PPP procurement system and making it an effective tool to monitor the conditions of the PPP projects; fit for its intended

purpose. In addition, all the information that related to dispute problems of Malaysian PPP projects can be used to form a PPP information database and used as a reference for the amendment of Malaysian PPP in future.

The drafting panel of the Malaysian version PPP procurement should be selected from different professions in Malaysian PPP projects because each party plays a different role in PPP procurement. It should cover professional personnel that are involved in construction contract administration to adopt their professional opinion in the procurement process. It will provide a better medium to unite all these different parties since it was drafted by people from the profession itself. Other than that, it is also important to collect opinion from public sector, private sector and also end user of SPV especially their comment on the current performance of Malaysian PPP. All these data will definitely form a more efficient Malaysian version PPP.

A maintenance team can be formed in the government department of Public Private Partnership unit (3P unit). They are specialized to monitor the usage of the revised Malaysian version PPP in order to gauge its efficiency and to check if all the amendments made are really useful and benefits the end users. It is also equally important to provide continuous revision on the Malaysian version PPP in a more frequent way. This will definitely produce an ideal Malaysian version PPP procurement system that caters to the public needs and at the same current situation in the industry that is always subjected to change.

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APPENDIX

Appendix 1

QUSTIONNAIRE

An investigation on Critical Success Factors (CSFs) of Public Private Partnerships (PPP) in Malaysian construction industry

Dear **Sir/ Madam,**

This questionnaire is distributed in order to gauge the study of "An investigation on Critical Success Factors (CSFs) of Public Private Partnerships (PPP) in Malaysian construction industry".

The main purpose of this research is to explore and re-examining the critical success factors (CSFs) necessary for adopting public private partnerships (PPPs) in Malaysian construction industry, in general, without referring to any specific PPP sector or project. Therefore, the objective of this research is to identify the relative importance of the CSFs for achieving the success of PPP projects implementations as perceived by the overall respondents in Malaysian Construction Industry.

I will highly appreciate your experience, and willing listen to your opinions and ideas. I hope that this study, with the enthusiastic participation from you, will contribute to the development of PPP in the construction industry. I assure that your responses will be confidentially kept, and will be only published as the general attitudes of the survey. The questionnaire takes about 10 minutes to be completed.

Please return the completed questionnaire by email before 01/05/2014 to:

Oh Chin Phang,
Lab. of Construction Engineering and Management
Department of Civil Engineering,
Pukyong National University
E-mail: ocp_8182@yahoo.com, ocp81828182@gmail.com

Your kind cooperation is highly appreciated.

SECTION 1 : PERSONAL INFORMATION

Please tell the researcher some information about you. (Please mark "X" in the cell you choose.)

1. In which field do you work?

	Public sector
	Private sector
	Others ( )

2. What kind of work position are you undertaking?

	Project manager/ planner
	Manager
	Quantity surveyor
	Engineer (Civil, mechanical *etc*.)
	Architect
	Builders
	Supplier
	Developer
	Financier
	Lecturer/Professor
	Others ( )

3. Which type of organization are you work with?

	Public institutions
	Consulting firm (Project management)
	Architecture firm
	Construction firm
	Engineering firm
	University
	Others ( )

4. How many year of working experience do you have?

	<5 years		6-10 years		11-15 years		>16 year

5. How many PPP projects have you been involved in your professional career?

	None
	One
	Less than five
	Between 6 and 10
	More than 11

6. According to your experience, do you think the Malaysian public- private partnership (PPP) need to be review and revised?

	Yes
	No

SECTION 2 : CRITICAL SUCCESS FACTOR OF PPP

1. *According to your experience, please indicate how important do you find the following critical success factor in achieving the success of PPP projects implementations? Please circle the number following the scale below:*

"1"= "Not important at all", "2"= "Less important", "3"= "Moderate", "4"= "Important", "5"= "Very important"

No.	Critical success factor	Answer				
1	Strong private consortium	1	2	3	4	5
2	Sound economic policy	1	2	3	4	5
3	Multi-benefit objectives	1	2	3	4	5
4	Government involvement by providing guarantees	1	2	3	4	5
5	Competitive procurement process (enough potential bidders in the process)	1	2	3	4	5
6	Commitment and responsibility of public and private sectors	1	2	3	4	5
7	Stable macro-economic environment including low inflation, stable exchange and interest rates	1	2	3	4	5
8	Thorough and realistic cost/benefit assessment	1	2	3	4	5
9	Social support	1	2	3	4	5
10	Favourable legal framework	1	2	3	4	5
11	Political support	1	2	3	4	5
12	Good governance	1	2	3	4	5
13	Available financial market	1	2	3	4	5

14	Transparency in the procurement process (process is made open and public)	1	2	3	4	5
15	Well-organized public agency	1	2	3	4	5
16	Project technical feasibility	1	2	3	4	5
17	Shared authority between public and private sectors	1	2	3	4	5
18	Appropriate risk allocation and risk sharing	1	2	3	4	5

SECTION 3 : COMMENT FOR CRITICAL SUCCESS FATOR OF PPP

1. *According to your experience, would you like to add some personal comments on the critical success factor of PPP projects?*

=== Thank you for your participation ===

Any inquiries/comment/suggestion, please feed back to the research group by following representative:

Oh Chin Phang

Lab. of Construction Management, Dept. of Civil Engineering, Pukyong National University

Email: ocp_8182@yahoo.com

Phone: +821082175586