Public Private Partnership (PPP) Project Performance in Malaysia: Identification of Issues and Challenges

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***Abstract*— Public Private Partnership (PPP) in Malaysia as an innovative procurement mechanism aims to undertake the public sector infrastructure project construction in order to overcome the weaknesses of conventional system. PPP is seen significantly viable to enhance the quality of public services and stimulate economic growth. After the decades of its implementation, many arguments have been reported along the lively growth of PPP project development. Within that context, this study provides a review of issues and challenges for PPP pertaining to project performance in Malaysia. The objective of this study is to highlight the loophole of PPP implementation in Malaysia through a qualitative approach. A qualitative approach was used to analyse contextual literature review and to investigate four selected performance measurement models as the precedent study to provide a basis for improvement of PPP in Malaysia. The findings showed that the issues and challenges were almost similar between the literature and selected models in which the guideline / framework, Key Performance Indicator (KPI), risk allocation, efficiency & flexibility were perceived as dominant issues. Apart from that, a technical factor had proven as the most threated factor that could hinder the implementation of PPP project in Malaysia. Hence, the structure of PPP model should be more viable towards the stakeholders by developing a clear, realistic and concise guideline in order to improve the service delivery performance and return value for money.**

***Keywords*—** *Public Private Partnership (PPP); Project Performance; Issues and Challenges*

1. Introduction

Public Private Partnership (PPP) or Private Finance Initiative (PFI) is a procurement method that has been successfully implemented by many countries worldwide such as United Kingdom, Australia, USA, France, Germany, Italy and Japan. With the recent success, PPP has become more common in Malaysia. In the Ninth Malaysia Plan, the government officially announced the adaptation of public projects using the PPP scheme. The concept of this scheme is to promote a contractual relationship between public sector as a client and private sector as an asset creator and also a service provider. The private sector will finance and manage a full package of capital investment and services, which involved pre-construction, construction and post construction (operation & maintenance) [1].

Meanwhile through PPP projects, the private sectors are accepting responsibilities to maintain the asset throughout the long term operational concessionaire period. PPP project offers a full package comprising the combination of the design, construction, finance, operation and maintenance of the facilities which the payment being made based on the pre-determined standards and performance of the service provided [2]. Since it has a significance relationship between performance and whole life cycle project, the private sector must be able to provide high quality services as required by the standard in terms of level, quality and timeline.

Recently, Malaysia has carried out many successful PPP projects that contributed to social benefits, such as Light Rail Transit (LRT), highways, medical facilities, bus station, school, government quarters and economic zones [3, 4, 5]. In 2016, there were 28 active PPP projects in progress as reported by Public Private Partnership Unit, Prime Minister Department of Malaysia (UKAS). However, according to [6], Malaysia has faced few constraints in adopting PPP such as lacking of guidelines on PPP from the government, higher charge towards direct users, lengthy delays in

International Journal of Supply Chain Management
IJSCM, ISSN: 2050-7399 (Online), 2051-3771 (Print)

negotiation due to political debate, misunderstanding over government objectives and evaluation criteria. It can be interpreted that the type and level of constraints are different according to type of facilities.

In conjunction with numerous issues, PPP project has been highlighted as one of the crucial agenda that have been deliberated during the National Asset and Facility Management (NAFAM) convention in 2009 organized by Public Work Department (PWD) of Malaysia in collaboration with private company. [7] reported the outcome from the convention remarked that the PPP assets need to be managed properly to enhance their tangible and intangible values and to continue providing the service, safety and comfort to public through performance monitoring.

Therefore, this study will investigate general issues and challenges related to PPP projects performance that has significant relationship with Malaysia and comparing few selected performance models from various countries to identify the similarity and differences. The research findings will produce a proposed diagram that targets PPP projects in Malaysia.

2. Public Private Partnership (PPP) Project Performance

According to [8], the PPP project performance could be influenced by a number of factors and their interactions during project life cycle. Therefore, a well-defined performance criteria and objectives combined all stakeholder was needed in order to develop a systematic performance management system. Thus, [9] suggested that accurate analysis of performance could be attained only after the KPIs were determined and monitored. Key Performance Indicator (KPI) defined as a tool of attribute to assess effectiveness and examine performance of PPP projects with regards to already defined performance objectives [8].

As a basis of the study, [10] Critical Success Factors (CSFs) could be the pillar to achieve PPP project objectives. CSFs defined as “those few key areas of activity in which favorable results are absolutely necessary for a particular manager to reach their goals”. [11] agreed that it was significantly important to assist organization in identifying critical success element to be emphasized to reach a successful project. [12] revealed that for overall PPP projects in Malaysia, the top success factor were favorable legal framework, competent governance, good commitment from public and private sectors, availability financial market and sound economic policy.

Different from conventional procurement using prescriptive specifications, PPP projects procured using performance based output specification in which the ultimate target were to achieve value for money, whole life asset performance innovation, risk transfer and developing performance criteria in relation to payment mechanism [13].

While, in the aspect of project benefits, several performance mechanisms are created interconnected in which the payment mechanism become essential part of PPP contract. It linked to the standard to be achieved in terms of facilities availability, safety, user satisfaction, operation and maintenance. Based on agreed formula, public sector client will contribute the payment to the private sector contractor through regular basis [14]. In general, two types of maintenance fees involved for payment process; maintenance charges and maintenance reserved fund (long term maintenance programme) which exclude the availability charges that purposely for development cost.

Furthermore, the development of project performance assessment should rely on each stakeholder performance objectives to attain their expectations. Two layer approaches for the assessment of PPP projects suggested by [8]; (1) level of service for users, effectiveness and value for money for public sector and profitability for private sector; (2) combine weighted and adjusted to fulfill each of specific stakeholder.

3. Issues and Challenges

In conjunction with the tremendous growth of PPP implementation in Malaysia, the PPP evolves with many theoretical and empirical debates and issue pertaining to improve service quality. Therefore, some issues raise in project performance for PPP have been highlighted as follows:

3.1 Insufficient of PPP Implementation Guidelines

According to [15], there was no clear framework for monitoring or performance auditing as well as

the tendering mechanism, project financing and project implementation for PPP projects in Malaysia which may cause conformity issue pertaining to government's objectives and the need statement of evaluation criteria. In addition, [16] mentioned many critics in regards to PPP in Malaysia such as lack of transparency in the tendering process, the absence of referred guidelines, incomplete Key Performance Indicator (KPI) and less training and education. This statement was supported by [17, 18] as they confirmed that this factor could hinder PPP adoption in the Hong Kong and UK.

3.2 Challenge in Managing KPIs

[13] indicated PPP projects in Australia were grappling with several challenges especially in the aspect of managing Key Performance Indicator (KPIs). It has a numerous and very complex KPIs which were difficult to implement and monitor, subjectivity in output specifications which lead to different interpretations, unclear risk allocation and problems in change negotiations. Besides, the payment mechanism was also unattractive in providing incentives (in monetary terms) to the contractors if they performed better than above requirements. Furthermore, it was difficult to forecast any possible changes in a PPP contract in the situation of adding a capacity, changes in law or functional requirements for a long concessionaire periods of about 20-30 years. As a result, Malaysia will experience the similar challenges due to the principle of PPP structure model following the established country like United Kingdom.

3.3 Maintenance Approach

Most of PPP projects in Malaysia involved with public sector which the government have to streamline the maintenance aspect in order to sustain the property value. [19] through Total Asset Management (TAM) manual revealed that the current practiced of government asset maintenance by most of government agency likely based on reactive maintenance through ad hoc without systematic planning and scheduled programme. It has resulted many weaknesses such as improper planned maintenance, decreased the asset life cycle, uneconomic long term cost, soften rectification work and increase agency workload. In order to improve the system and process of asset management strategy, the manual urged the government agency to measure and evaluate the asset service performance according to Agreed Service Levels (ASL), Key Performance Indicator (KPI) and any other related performance indicator. An example of poor performance in maintenance work being reported by [20] for incompliance with output specification in PPP hospital projects in Australian and UK.

Under the PPP, private sector would tender for work on the project that they would design, finance, build and operate the asset throughout concession period. Hence, the emphasis was on whole life cycle costing involved a long term operational phase. Although asset whole life costing has been a long standing requirement in the public sector, it has not been widely adopted due to the fragmented nature of the industry and the practice of awarding separate contracts for design, construction, operation and maintenance caused the different approach and effectiveness [21]. For example, the structures of PPP of Malaysia were awarded the contract to different organization for construction and operation/maintenance although they were under the same Special Purpose Vehicle (SPV).

3.4 Service Delivery Failure

Service failure was often reported within PPP projects whereas the liabilities of the failure were taken under responsibility of the facility management function. In addition, the frequency with which performance failures occurred and penalties imposed were applied across a wide range of PPP projects particularly related to social infrastructure projects would remark that such integration between asset and service delivery was not widespread and effective [22]. Apart from that, the service delivery failures occurred due to the PPP altered the character at certain critical points, most frequently when Special Purpose Vehicle (SPV) has finalized its financial arrangements, when design of the asset finalized and when handing over the asset prior to service delivery commencement [23].

3.5 Asset Risk

Assets were directly exposed with high attainment risk and could influence their performance in which several risks need to be foreseen in most PPP projects. For example, risks associated with design and construction, project commission and

operation, technology and obsolescence, demand (or usage/volume), regulation, residual value and project finance [24]. Therefore, the private sector should genuinely predict the risk because it was one of the basic fundamentals for PPP project requirement [25]. [26] revealed that contractor has been notified to consider the pro-client opinion and follow the client decision during the design stage of PPP projects to specify the highest quality materials which it was indirectly reduced contractor risk during the operational phase.

3.6 Life Cycle Issues

Despite in most cases which Life Cycle Cost (LCC) for the asset were generally performed, however, the calculation usually was overlooked and omitted because it was not a universal requirement and it caused the facility management to face difficulties [27]. Although the utilization of LCC would definitely reduce the overall running cost of facility over the life span of the asset, several issues highlighted the absence of calculation and too much focus on lowest capital cost has given impact towards the increment in running cost and reduction in profitability [28]. Moreover, the importance of LCC calculation was neglected in PPP concessionaire due to the different separate entities undertaken different stages of design, construction and facility management functions [23].

From the above literature, the issues and challenges are summarised and listed to determine their relationship factor. The factors classified as human, technical or financial factor. The details are as follows:

Table 1. Summary Issues and Challenges from Literature

Issues	Challenges	Factor
A. Insufficient of PPP Implementation Guidelines	a) No clear framework for monitoring or performance audit	Technical
	b) Unclear tendering mechanism, project financing and implementation	Technical/Financial
	c) Lack of transparency in tendering process	Technical
	d) Absence referred guidelines	Technical
	e) Less training and education	Technical
B. Challenge in Managing KPIs	a) Incomplete KPI	Technical
	b) Very complex KPIs to implement	Technical
	c) Subjectivity in output specifications	Technical
	d) Unclear risk allocation in change negotiations	Technical
	e) Unattractive payment mechanism in providing monetary incentives	Technical/Financial
	f) Difficult to forecast any possible changes in contract, law or functional requirements	Technical
C. Maintenance Approach	a) Improper maintenance planning and scheduled programme	Technical
	b) Incompliance with output specification	Technical
	c) Fragmented nature of industry	Technical

D. Service Delivery Failure	a) Integration between asset and service delivery not widespread and ineffective	Technical
	b) Change the character at certain critical points	Technical/Human
E. Asset Risk	a) Risks associated with:	
	• Design & construction	Technical
	• Project commission & operation	Technical
	• Technology & obsolescence	Technical
	• Demand (or usage/volume)	Human /Technical
	• Regulation	Technical
	• Residual value	Technical
	• Project finance	Technical
F. Life Cycle Issues	a) Absence / omitted of calculation	Technical / Financial
	b) Priorities on lowest capital cost	Financial

Table 1 shows the most frequent factor involves with issues and challenges is the technical factor. It is due to the weaknesses of current implementation on these following items:

a) Guidelines and framework

b) Operational procedure and work process

c) Output specification and performance indicator

d) Scheduled planning and programme

e) Associated risks

4. Research Methods

This study is purely based on literature review. The publications related to PPP project performance in Malaysia context were reviewed where the issues and challenges were grouped into six dominant areas. In addition, four worldwide framework models were chosen as precedent studies. It reviews theoretically performance measurement assessment models applied in the; (1) UK & Australia (by country) and (2) hospital & transport infrastructure (by sector). Comparative analysis was carried out against the models to highlight their advantages and disadvantages. Hence, Malaysia PPP model was gathered into the analysis to identify the gaps. The outcomes from literature review and comparative analysis were tabulated into summary of findings diagram. A diagram therefore suggested a way forward for improvisation of PPP implementation in Malaysia.

5. Performance Measurement Assessment Models

Table 2 shows the performance assessment models for PPP projects adopted by the UK, Australia and anonymous countries (combination from worldwide model). The selections of these models are based on their origin of characteristics, rigorous implementation, learning capacity, recent study and pioneer of invention in terms of performance assessment approach. The discussions about the models are as follows:

Table 2. List of PPP Performance Assessment Models

Model	Name of Model	Country
Model 1	UK sustainability performance measurement framework for PFI projects [29]	UK
Model 2	Australia output based specification for PPP projects [13]	Australia
Model 3	Framework model of output specifications for hospital PPP/PFI projects [15]	Australia & UK
Model 4	KPI for PPP transport projects [8]	General

5.1 Model 1

The need for sustainability input encouraged the development of this model. The UK government has recognised the potential role of PPP in delivering sustainable development. This model promotes the relationship between PPP procurement system and sustainable development. Social, economic, environmental aspects were integrated with technical aspects into sustainability model to achieve the balance output of performance. The indicators provided are applicable to all types of PPP projects. The evolving of sustainable development may require the inclusion of new technology adaptation, energy consumption and low maintenance cost. New indicators are also forecasted due to rapid development in the latest innovation research and low carbon technologies.

5.2 Model 2

The purpose of this model is to examine the common issues faced by public and private sectors in drafting output specifications for Australian PPP project. It could be useful information for stakeholder on lesson learn when procuring social and economic PPP projects in order to achieve value for money and suitable risk transfer. The model aims to evaluate how the stakeholders handle for future changes in output specifications and adapt the flexibility to achieve the project objectives. The model also suggests the user requirements should be stated clearly into output specifications. Other than that, the relationship with facilities management is also being highlighted.

5.3 Model 3

This model is designed for adoption by public sector clients as part of regulated planning to develop hospital PPP projects. Five components involved in the development of proposed framework which are physical asset requirements by public sector, operational services provision by the private sector, relationship between payment mechanism link to performance evaluation, change mechanism and hand over requirements to the public sector. It is seem to be a difficult and challenging task when drafting output specifications for hospital PPP project due to the complexity and changing needs with regards to health policy, medical advancement and technology. The utmost aims of preparing good output specification are to achieve whole life asset performance, value for money, risk transfer, innovation and expected payment mechanism.

5.4 Model 4

This model purposely develops to seek the perspective of different stakeholders towards the use of key performance indicators (KPI) from the analysis of critical success factors (CSF) for PPP transport projects. Due to the different performance objectives from each stakeholder, the assessment has to divide into two layers approach. The first layer trying to attempt the ultimate objectives of every stakeholder standpoint, i.e. value for money and effectiveness for public sector, profit ability for private sector and satisfaction level of service for users. For second layer, it is a combined approach (using the same criteria) where the adjusted and weighted merit used to fulfill each of stakeholder objectives. The model classified technical, operational / functional and financial as overall KPIs to determine the PPP success or failure.

6. Results and Discussions

Table 3(a) shows the summary and understanding of performance measurement models adopted by various countries (UK & Australia). Model 1 has identified its hurdles of implementation which were lack of consultant with experience in sustainability and depth analysis of individual projects. Model 2 has stated clearly that it was not user friendly as it

involved complex and numerous KPI, difficult to predict every possible change in a PPP contract, difficult to implement & monitor subjectivity prone to different interpretation, no incentives mechanism, unclear risk allocation and unclear Critical Success Factors (CSF). Model 1 was considered more flexible where it could be used for social or economic infrastructure while Model 2 was specifically covered the social infrastructure.

Table 3(b) shows the summary and understanding of PPP framework models to differentiate the social infrastructure and economic infrastructure characteristics. Model 3 revealed its constrain on health policy, technology & medical advancement, not affordable and not flexible to all sectors. Thus, it was not a user friendly to the other sectors. While Model 4 has difficulties in finding correlation between Critical Success Factors (CSF) and Key Performance Indicator (KPI) due to different stakeholders involvement creates different objectives and evaluation criteria. In summary, different sector required different performance measurement framework to suit with the nature of work.

Table 3. Comparison PPP Framework Models

3(a) Comparison PPP Framework Model (Based on Country)			3(b) Comparison PPP Framework Model (Based on Type of Infrastructure)	
Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Framework Model	UK sustainability performance measurement framework for PFI projects [29]	Australia output based specification for PPP projects [13]	Framework model of output specifications for hospital PPP/PFI projects [15]	KPI for PPP transport projects [8]
Country	United Kingdom	Australia	Australia & UK	Not specified - General
Sector (Type of Infrastructure)	Social & economic infrastructure	Social infrastructure	Social infrastructure (Hospital)	Economic infrastructure (Transport)
Year	2012	2013	2012	2013
Reference Assessment Tools	Key Performance Indicator (KPI)	Output specification	Output specification	Key Performance Indicator (KPI)

Performance Measurement Areas	Sustainability sectors (28 indicators): i. Social sector - 6 ii. Economic sector - 6 iii. Environmental sector - 10 iv. Technical sector – 6	i. Whole life asset performance ii. Innovation iii. Risk transfer iv. Payment mechanism v. Achievement of value for money	i. Design and construction (Scope, design parameters, structural performance, architectural performance, electrical & mechanical performance, special installation performance, external works and landscaping requirements) ii. Post construction requirement (Scope, availability, service requirements, service monitoring, rectification requirements, change & link to payment mechanism)	Standpoint according to each stakeholder: i. Public sector – economic, technical and operation / maintenance ii. Private sector – financial, technical, effectiveness and competitiveness iii. Users – safety, facility condition, time interval for defect rectification, level of service, road availability, waiting time and closed days iv. Overall KPIs – technical, operational / functional and financial
Hurdles	i. Lack of consultant with experience in sustainability ii. Less critical success factor of sustainable PPP projects iii. Depth analysis of individual projects iv. Geographical bias in survey sample	i. Too many and complex KPI were specified ii. Difficult to monitor, measure and implement by client iii. Hindered innovations iv. Inappropriate risk allocation v. Misinterpretation of output specification vi. Subjective elements caused inflexibility to commit future changes	i. Complexity and transforming needs regarding evolution of health policy, medical advancement and technology change ii. Flexibility issue to the other sectors	i. Complex task because the model combined three stakeholders with different objectives and criteria

In comparison with above precedent study of PPP model, Malaysia has produced the guidelines to attempt the needs of reference from parties involved (Table 4). According to [30], the model was formulated by the governance of Malaysian PPP based on the central agency guideline, privatization master plan and relevant national policies with aims to produce clear guidelines on the principle applied, project development criteria, selection and justification. However, many critics on the implementation of PPP policy in Malaysia such as unclear set of guideline, lack of knowledge, culture and shortage of expertise, policy lack of transparency and government still absorbed many risk [16]. Therefore, Malaysia government should improve the policy accordingly.

Table 4. Malaysia PPP Models

Variables	Description
Framework Model	Ninth Malaysia Plan and Public Private Partnership Guideline [1, 31]
Country	Malaysia
Sector (Type of Infrastructure)	Social & economic infrastructure
Reference Assessment Tools	Key Performance Indicator (KPI)
Performance Measurement Areas	Level, quality & timeline of service provision
Hurdles	No specific guideline for performance assessment where the information too general. The details of performance assessment are being formulated by Special Purpose Vehicle (SPV) and validate by client (public sector).

From the above reviews and comparative analysis models:

a) the issues and challenges are slightly similar within the selected models and literature.

b) the three major factors were identified; human factor, technical factor and financial factor.

- technical factor related to the engineering component of the project usage.
- financial factor related to the cost component such as profit, cost reduction, pricing at certain risk and value for money.
- human factor related to the physiology effect in term of action and decision making.

c) the most frequent issues reported are related to KPIs, guideline or framework, risk allocation, efficiency and flexibility.

d) the output specification and key performance indicator are interrelated to each other and they can be used as a reference tools for performance assessment. Key performance indicators are developed to meet the output specification requirements. Performance indicators are more details and objective compared to subjectivity of output specification in a certain situation.

Figure 1 shows the summary of findings to provide a basis for Malaysia PPP improvement.

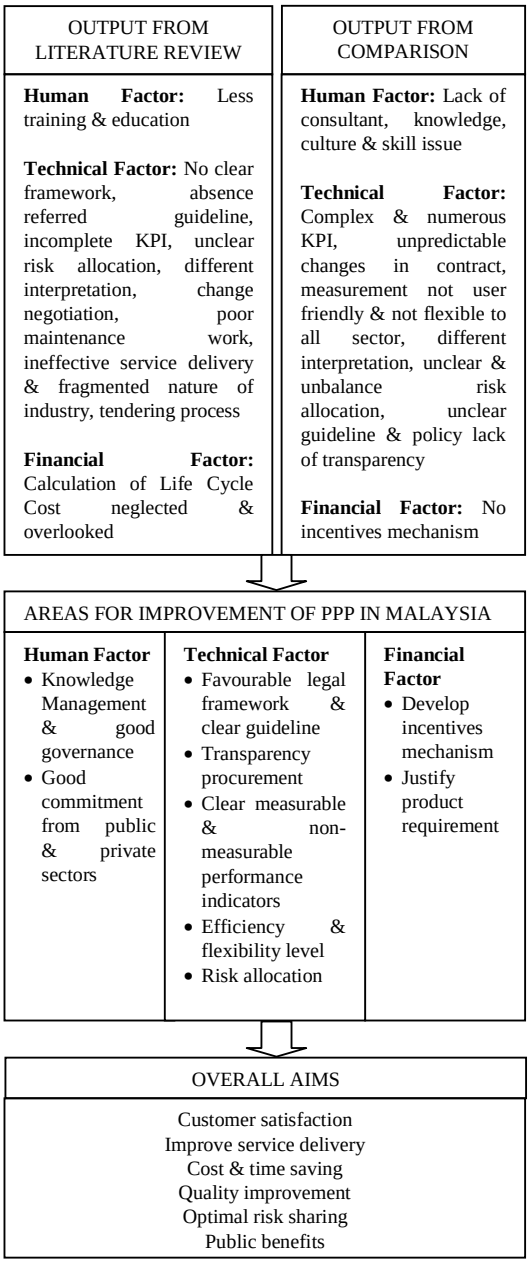

Figure 1. Summary of Findings

7. Conclusions

PPP projects in Malaysia are struggling in facing few issues and challenges in the aspect of project implementation, performance assessment and monitoring. The three factors were identified as a contributing factor that creates an issues and challenges from selected PPP models across the globe; namely human, technical and financial factor. Among them, the technical factor has produced the highest and complex issues. It is recommended that the structure of PPP model and performance measurement assessment approach should be revised regularly to adapt with the current needs, more viable among stakeholders by developing a clear, realistic and concise guideline in order to improve the service delivery performance and return value for money. Through a long term relationship between public sector and private sector, it can enhance to facilitate learning, stimulus innovation, knowledge sharing and to have a continuous service delivery. For the future direction of this research, it will be concerned on the fulfillment of lacking areas of PPP in Malaysia which particularly in the aspect of performance assessment and monitoring.

Acknowledgments

The authors would like to express their deepest gratitude to the Ministry of Higher Education (MOHE) of Malaysia Government, Universiti Kebangsaan Malaysia (UKM) and Universiti Teknologi MARA (UiTM).

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