

e-Proceeding V-GO GREEN 2020²⁹⁻³⁰ SEPT

VIRTUAL GO-GREEN: **CONFERENCE & PUBLICATION**

"SUSTAINABLE ENVIRONMENT, RESILIENCE AND SOCIAL WELL-BEING"

Organiser :
Research, Industrial Linkages, Community &
Alumni Network (PJIM&A)

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Faculty of Architecture, Planning and Surveying (FSPU)
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Publication Date : 22nd February 2021

Virtual Go-Green Conference and Publication 2020

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February 2021

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e ISBN 978-967-2920-06-9



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AN EMPIRICAL INVESTIGATION ON FACTORS IMPROVING THE EXECUTION OF KEY PERFORMANCE INDICATORS (KPIs) FOR ASSESSING THE OPERATIONAL PERFORMANCE OF PPP PROJECTS

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Abstract

Public-Private Partnership (PPP) is conceptualised as a performance-based procurement in which concessionaires are contracted to provide efficient facilities and services to the government. The quality of the facilities and services provided by the concessionaires will be assessed using key performance indicators (KPIs). This KPIs is used for determining the level of performance against the agreed level of standards as expected by the government. However, most of the PPP projects are currently facing difficulties in meeting the expectation. It is due to several issues such as lack of methods for measuring the KPIs, the lack of understanding of the KPIs implementation, project performance not reflecting the actual performance (physical) on-site, and inconsistent work performance. These shortcomings have led to the difficulty in determining the performance level of the PPP projects. Therefore, this paper aims to determine factors that facilitate in improving the implementation of KPIs for assessing the operational performance of PPP projects. The qualitative research methods using case studies via semi-structured interviews were conducted within PPP stakeholders. The data were obtained from 32 semi-structured interviews conducted across six (6) case studies university campuses. The results discovered that seven (7) factors in improving KPIs implementation for PPP projects had been determined. The determination of these factors can serve as an improved measure in assessing the PPP project performance at the operational level throughout the concession period.

Keywords: *improving, key performance indicators, operational performance, public-private partnership.*

1.0 INTRODUCTION

Public, Private Partnership (PPP) refers to the contractual arrangement between the public and private sectors to enhance their participation in the economic development of a country. The PPP project originating in the United Kingdom (U.K.) has been extensively practised globally, including Australia, Hong Kong, China and Malaysia. According to Yuan et al. (2009), PPP projects have always emphasized on value for money (VFM) based on a concordant partnership. Atkin and Brooks (2009) stated that VFM is concerned about the quality of service and the effectiveness of how it is delivered. Thus, to achieve VFM, it is vital to monitor the performance of the projects throughout the PPP life cycle (Liu et al., 2015). Besides, Yuan et al. (2009) stated that during the PPP project life cycle, performance might be affected by several factors. For instance; insufficient procurement incentive, low measurement system and lack of risk management may result in inefficiency and ineffective project performance.

In PPP contracts, performance measurement tools have been adopted by the public sector to measure and monitor the performance and quality of services delivered by the concessionaires. It is done to ensure that the level of agreed standards as specified in the

output specifications are achieved. Further, the concessionaires are paid to deliver the services according to the required quality and performance level (Yuan et al., 2009). It is in line with the PPP concept that refers to a performance-based payment mechanism, where payments will be deducted from the unitary charges if the services do not meet the performance standards as outlined in the output specification (Oyedele, 2013; Ernst & Young, 2008). Also, Lam and Javed (2015) added that failure to achieve performance standards would also lead to continual payment deductions and rectification works within a specified period. This is in parallel with the PPP Malaysian guideline that imposes penalties using price deductions due to under-performance and non-compliance if the key performance indicators (KPIs) are not met (UKAS, 2009).

Ogunsanmi (2013) and Yuan et al. (2009) stated that to measure project performance, KPIs are the most reliable tools, particularly in the PPP procurement approach. Principally, KPIs for PPPs have been developed to ensure that all concessionaires perform their responsibilities in complying with the government's standards (Ninth Malaysian Plan, 2006). These standards will lead to either rewards or imposing penalties on the concessionaires. Moreover, it is crucial to re-establish the importance of KPIs in the PPP procurement approach so that the project's performance can be sustained for a more extended period. However, even though numerous studies have concentrated on performance measurement and monitoring intending to achieve VFM, limited attention has been directed towards its implementation that can strongly influence and improve the performance of PPP projects. As suggested by Yuan et al. (2009), it is necessary to include the use of performance objectives and KPIs in PPP projects. Therefore, based on previous research, there are limited studies that have investigated KPIs in the context of PPP projects. Therefore, it is observed that limited research has been undertaken on the importance of KPIs implementation, especially during the operational and maintenance (O&M) phase of PPP projects. Thus, the contention of this research is to determine factors that facilitate in improving the implementation of KPIs for assessing the operational performance of PPP projects.

2.0 ISSUES OF PPP IMPLEMENTATION IN MALAYSIA

The PPP procurement approach has been adopted extensively in construction projects globally with the main goals to achieve VFM. As mentioned by Almarri & Boussabaine (2017), the main driver behind the paradigm of PPP procurement is achieving VFM by providing all the necessary service provisions at an optimal cost and to the output specified standards. Furthermore, VFM in the PPP context is also often used to express satisfaction on the cost of good quality service by achieving good performance (Ismail, 2009). Although the importance of achieving good performance is often emphasized in the implementation of this procurement approach, there are still numerous PPP projects that demonstrate low-performance levels especially in social infrastructure projects (Liu et al., 2016). Besides this, Hashim et al. (2017) also reported that most PPP projects are currently facing difficulties in meeting client expectations. Accordingly, these issues have raised questions concerning the rationale of adopting the PPP approach in Malaysia, where VFM is a part of the goal to achieve success (UKAS, 2009).

Currently, the implementation of PPP's, especially for PFI schemes in Malaysia, has entered into the fifth year of the O&M phase and many researchers had argued on the issues and challenges that will be faced by the stakeholders in this phase (Hashim et al., 2017; Khaderi & Aziz, 2010). Among these include insufficient PPP implementation guidelines, difficulties in managing KPIs, maintenance approach, service delivery failure, asset risk, and life cycle issues (Hashim et al., 2017). He further added that these issues would indirectly contribute to project implementation failure. This claim is also supported by Hashim et al. (2018) in a study stating that defects occurring in PPP projects had significantly affected project performance and disrupted project operations during the O&M phase.

In the Malaysia context, one of the problems faced by PPP stakeholders is the challenge in managing KPIs effectively (Lop et al., 2018; Hashim et al., 2017) KPIs in the context of the PPP approach is used to ensure that project performance is achieved at a certain level in line with agreed quality standards. Thus, KPIs are a useful mechanism in assessing the performance of a PPP project operation. The agreed level of performance is what helps to

determine the payments or deductions from the public sector to the private sector. Therefore, if the quality of service does not meet the minimum standards and requirements as stipulated in the output specification, a payment deduction or other penalties can be triggered in the form of a performance failure payment deduction (Yescombe, 2007). Javed et al. (2013) revealed that there were numerous and complex KPIs specified in the PPP contract, resulting in the difficulties in monitoring, measuring, and implementation by end-users. This finding is further supported by an interview conducted by Javed et al. (2013) on the challenges faced by Australian PPP projects. Thus, the development of appropriate KPIs is essential in determining and ensuring the level of quality services to be delivered to monitor and measure effectively and efficiently.

3.0 METHODOLOGY

A qualitative method via the exploratory approach of six (6) case studies by using semi-structured interviews is conducted. This corresponds with the semi-structured face-to-face interviews with professionals and experts involved in PFI project operations. The selection of case studies was based on the list of projects established by the Public-Private Partnership Unit (UKAS) of the Prime Minister's Department of Malaysia. However, this research only focused on the educational sector. Six (6) university campuses under phase 1 were chosen as the research case studies based on the earliest PPP projects that have been implemented in Malaysia. Purposive sampling was adopted where thirty-two (32) participants among PPP stakeholders involved in the case study projects have been selected and participated. The data obtained from these interviews were analyzed using the thematic technique (Atlas.ti 8).

4.0 RESULT AND DISCUSSIONS

Table 1 presents the cross-case analysis from the six case studies on the factors that facilitate in improving the current implementation of KPI's for PFI Projects.

Table 1: Cross-case analysis of the factors for improving the implementation of KPIs in PFI projects across case studies

No	Broad Themes	Sub-themes	Campuses					
			A	B	C	D	E	F
1	Strengthen the Implementation of KPIs	• Improve on the implementation method.	√	√	√	√	√	√
		• Enforcement on KPIs implementation.	√	√	√	√	√	√
		• Firm decision by top management.			√		√	
2	Establish Construct Indicators	• Construct indicators should be detailed.	√	√	√	√	√	√
		• Prioritize the indicators by assigning a weightage.	√	√	√	√	√	√
3	Establish a Method of Measurement	• Standardize and improve the assessment method.	√	√	√	√	√	√
4	Increase the Knowledge on KPIs	• Organize training.		√	√	√	√	√
		• Knowledge transfer.	√			√		√
5	Close Monitoring on the KPI's Elements	• Supervise and monitor KPIs elements.	√	√	√	√		

6	Provide sufficient competent staff	<ul style="list-style-type: none"> • Provide sufficient staff for carrying out the monitoring works. 	√
7	Avoid contractual conflict	<ul style="list-style-type: none"> • Avoid the involvement of political issues. • Improve KPI documentation to avoid conflict with the terms of the contract. 	√

Seven (7) factors were recommended by the participants that include; (1) strengthen the implementation of KPIs, (2) establish construct indicators; (3) establish a method of measurement; (4) increase the knowledge on KPIs; (5) close monitoring on the KPI's element; (6) provide sufficient competent staff and (7) avoid contractual conflict.

The findings show that strengthening the implementation of KPIs was seen as the topmost factor contributing to improving the implementation of KPIs for PFI projects in Malaysia. Based on the findings, the majority of participants across all cases had similar views, emphasizing on the issue of *strengthening and enforcing the monitoring of KPIs* regarding their implementation for improving project performance. The results also indicate that this is an essential strategy that needs to be stressed for improving the implementation of KPIs for PPP projects in Malaysia.

During discussions, a Senior Engineer (End Users) from Campus D, asserted that: To improve the good quality of service delivery, we need to increase the enforcement towards KPI implementation, for instance; by performing regular monitoring. This is to ensure that all established KPIs are well implemented according to the agreed level of standard **(D3-UD, Campus D)**.

The above statements show that the enforcement from the government on the implementation of KPIs should be consistent and taken seriously to ensure both parties attain the benefits of this partnership arrangement. Besides, the government should standardize the KPI's documentation, so that all campuses can use it for better implementation of KPIs. A Facility Manager of the Facilities Management Contractor added that *the government needs to make a fast and firm decision when it involves performance and KPI issues, meaning that, there should be a standard that can be referred to in resolving these issues especially when it comes to performance measurement issues (C4-FM, Campus C)*

A study by Ng and Wong (2007) added that performance monitoring provides a powerful incentive for contractors to deliver the standard of services needed by the public-sector as stipulated in the output specification during the O&M phase. Therefore, it can be deduced that, although performance monitoring provides advantages to the public sector in managing and measuring project performance, the enforcement of performance monitoring using KPIs is essential. This method of enforcement can also provide benefit to the private sector in improving service delivery and facilities to the required level of standard.

The second factor that was suggested by the participants was regarding *establishing construct indicators*. Based on the results, the majority of participants agreed that the construct indicators should be sufficiently detailed and clearly described. In the PPP approach, project performance should be measured according to the set and agreed standards and KPIs specified in the C.A. Thus, the development of KPIs is vital to ensure the private sector (F.M. contractor) is clear about the priority and scope of work and impact on the project's operations. Moreover, it will indirectly affect the performance level of the project. This is aligned with the opinion received from the Director of the Public Private Partnership Unit of the Prime Minister's Department of Malaysia (UKAS) stating that: *KPIs also need to be prioritized so that concessionaires can perform the tasks according to the priority and give emphasis for that work (GA2, all cases)*. This statement was further supported by the Senior Engineer (End Users) of Campus E, who added that *"... developed weighting for KPIs so that we can measure their performance accurately. There is a KPI with bigger weight, and there is a KPI that has a small weight. It all depends on the priority and impact of each KPI towards project performance". (E1-EU, Campus E)*

From the findings, it is clear that both the private and public sectors agree that assigning weightage for each KPI is crucial. This is to facilitate project implementation, especially involving the process of measuring performance and making payments. According to

Yescombe (2007) and H.M. Treasury (2007), the performance measurement system (PMS) is closely related to KPIs, and it usually involves weighing systems. In this situation, each KPI is given weightage based on the critical level and impact on the project's operations. Likewise, Oyedele (2013) mentioned that explicit and realistic performance standards, criteria, and weighting systems are among the factors identified to avoid performance failure payment deductions in PFI projects. Therefore, it can be surmised that both public and private sectors can gain the benefits and the private sector can, in turn, maximize their profits or returns on the investment by improving their performance and simultaneously avoiding payment deductions in PFI projects. On the other hand, the public sector (clients and end-users) can achieve VFM by enjoying the facilities that meet both their needs and requirements.

Another significant factor in improving the implementation of KPIs in PFI projects was highlighted regarding *establishing a method of measurement*. The participants viewed this as a significant factor in improving the implementation of KPIs in PFI projects. According to Oyedele (2013), there is a mechanism by which the public sector measures and monitors performance of the quality of services delivered by the concessionaire against agreed standards set out in the output specification. There are three (3) approaches to measure performance under the PFI contract, (i.e. the scoring system, fixed deductions, and performance penalty points). This was expressed by the Senior Engineer for Campus A that the *“mechanism on how to get the actual percentage of a project's performance is still vague, and I would suggest that the method of how to measure this performance needs to be refined and established to be practised by all PPP projects. That's important; thus, the actual project's performance and achievement by the concessionaire can be easily determined”*. **(A1-EU, Campus A)**

The above statement emphasises that it is crucial to establish a performance measurement mechanism in determining the accurate project performance level to improve PPP project implementation. Principally, in the PPP approach, the success of the projects depends on the performance level achieved which is determined by measuring the performance against the quality of service delivered by the concessionaire against the agreed standards (Oyedele, 2013). Thus, the determination of the actual percentage of project performance is vital, given it determines the amount of payment to the concessionaire. Moreover, it is aligned with the critical features of PPPs, where payment for services is based on pre-determined standards and performance measures (UKAS, 2009).

The fourth factor that was raised by participants to improve the implementation KPIs in PPP projects was to *increase the knowledge of KPIs*. According to Mustapa and Carrillo (2008), knowledge in managing services and facilities is crucial mainly in terms of the processes, the approaches in dealing with problems and the management of day-to-day operations in achieving better project performance. Therefore, in managing PFI projects, adequate knowledge on KPIs is needed among those involved in the project to ensure the project is implemented accordingly. Carrillo et al. (2006) suggest that one way of improving PPP performance is through the transfer of knowledge gained from previous projects, applied to future projects and PPP project teams. As mentioned by a Building Surveyor (Internal Auditor) from Campus B *Training and seminars on KPI implementation... we have to conduct as many as possible to all facility staff (end users) and F.M. contractor staff to enhance the knowledge and understanding on the KPI...so that the project can be well implemented. Through the execution of this training and seminar, it can be a platform to transfer knowledge or knowledge sharing”*. **(B3-EU, Campus B)**

Therefore, based on the findings, there are various means to improve the level of knowledge regarding the implementation of KPIs to the stakeholders involved through training, seminars and also conducting interactive workshops. It is also viewed as the best platform for transferring and sharing knowledge regarding KPI implementation among PPP project teams. Other factors suggested by the participants to improve the implementation of KPIs was around *close monitoring on KPI's elements, providing sufficient competent staff and to avoid contractual conflict*. These factors are considered significant, even though the discussion around these factors was limited across all six cases.

5.0 CONCLUSION

In Malaysia, the implementation of KPIs as a performance measurement tool at the O&M level is still relatively novel given there are many issues faced in the implementation of KPIs, making them ineffective. These issues may invariably affect the effectiveness and usefulness of KPIs as a measuring tool in assessing the performance of PPP projects, so it is critical to address these issues. The results from the interviews identified that strengthening the implementation of KPIs, establishing construct indicators, establishing a method of measurement, increasing the knowledge on KPIs, close monitoring the KPI's elements, providing sufficient competent staff and avoiding contractual conflict were among the crucial factors to be considered. The implementation of KPIs was viewed as the most crucial and essential factor in improving the implementation of KPIs in PPP projects. It can be attained by improving implementation method, enforcement and commitment from the top management in making the decision. Thus, it can be concluded that by identifying the factors for improving KPIs implementation, it can facilitate PPP stakeholders in managing and assessing the operational performance of the PPP projects.

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