

## The Implementation of Key Performance Indicators in the Malaysian Private Finance Initiative Projects

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### Abstract

In Private Finance Initiative (PFI), payment for services is based on pre-determined standards and performance. Thus, Key Performance Indicators (KPIs) have been used to measure this performance. However, lack of an effective KPIs was identified as a core criticism towards the implementation of PFI projects. Therefore, the objectives of the research are to identify the importance and challenges of KPIs in measuring this performance. A qualitative approach via semi-structured interview was adopted. The findings discovered that the current KPIs do not meet the criteria and this can lead to the difficulties in measuring the performance of PFI projects. The outcome of this research can serve as a theoretical base for the development of an effective KPIs for PFI projects implementation in Malaysia.

**Keywords:** Challenges; Importance; Key Performance Indicators; Private Finance Initiative.

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### 1.0 Introduction

In recent years, governments worldwide have adopted Private Finance Initiative (PFI) more extensively for the reason of achieving value for money (VFM). The government in the United Kingdom (UK) had originally adopted this procurement method since 1992. It involved the transformation from a traditional contract of delivery (design and construction) of providing public service projects to the privately financed (finance, design, construct, manage and operate) public facilities within the stipulated concession period, typically 20–30 years (NAO, 2003; El-Haram & Agapiou, 2002).

In Malaysia, a new wave of privatisation has been implemented under the Tenth Malaysian Plan to increase private investment in the economy, improve efficiency in the delivery of services and relieve the financial burden of the Government. PFI is viewed as restructuring the previous privatisation concept in delivering value for money for Malaysian public infrastructure. Among the many restructuring efforts in the privatisation is specifying the standard assessment of private concessionaires' performance through the execution of key performance indicators (KPIs) where it is benchmarked against the government's standard. Essentially, the PFI focuses on the VFM approach, its timely implementations, and efficient facilities management. The PFI program was aimed at facilitating greater participation of the private sector to improve the delivery of infrastructure facilities and public services (Prime Minister Department, 2009). As such, Rusmani (2010) in his research indicated that the introduction of several policies involving both the public and private in delivering the public projects was a measure to enforce the relationship between the two sectors. Therefore, the rationale of utilising the PFI procurement in Malaysia is to provide better and more efficient public services by sharing resources between public and the private sectors (Takim et al., 2008).

PFI procurement scheme in Malaysia is still at an infant stage, and the concept of PFI is lagging behind compared to other experienced countries such as UK and Australia. One of the issues experienced by the Malaysian government is in the assessment of

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PFI projects performance. The lack of effective performance measurement tool to measure the project performance is identified as a factor that leads to the poor project performance in Malaysia (Ismail, 2012; Khaderi & Aziz, 2010). Therefore, the establishment of a framework is vital to provide a better understanding of the execution of the complex scheme of financing, as well as the establishment of the KPIs for assessing overall projects' performances. Despite the tremendous growth of PFI implementation in Malaysia, the PFI arrangements have continually been reviewed and revised by the Malaysian government to improve the present practice of PFI implementation to ensure the achievement of its ultimate goal and objectives.

Currently, there are 28 projects listed under Unit Kerjasama Awam Swasta (UKAS), and 65% of the projects are for social infrastructure, which is in the educational sector and 35% are from economics infrastructures such as bridge and highway. Most of the PFI projects in Malaysia are currently operated under operational and maintenance (O&M) phase. However, poor performance (defects occurrence) and low level of end users' satisfaction (complaints) in PFI projects in Malaysia are disappointing. In the real situation, the government has paid a full amount of payment (availability payment) to the concessionaire but, indeed they have not met the level of performance standard set by the government. This situation occurs because of the lacking of an effective performance measurement tool to measure the performance of PFI projects especially after entering the O&M phase. This situation will affect the payment process to the concessionaire where payment deduction will be imposed if the concessionaire failed to meet the performance standard set by the government (Universiti Teknologi MARA, 2015; 2016; Isa et al., 2016). Therefore, performance needs to be monitored and measured to achieve VFM.

PFI projects are designed to fund long-term public infrastructures and services provided for the whole life cycle of PFI projects. During this period, PFI performances could be affected by a number of factors, which might cause the inefficiency and ineffectiveness of the projects. For instance; defects occurrence (Isa et al., 2016; Universiti Teknologi MARA, 2016); complaints from users on inadequate facilities and services provided; low level of users' satisfaction (Universiti Teknologi MARA, 2015; 2016); and conflict between payment and measuring performance (Oyedele, 2013; Yescombe, 2008). These factors can contribute to the PFI poor performance and consequently will affect the payment process. Payment deduction will be imposed to the poor or low level of performance standard achieved by the concessionaire (Oyedele, 2013). It is supported by the report from NAO (2010), that service failure and poor performance in maintenance work for non-compliance with output specification are frequently reported within PFI projects in the UK and Australia. This result will affect the success of a PFI project implementation and consequently be failed to achieve VFM. Factors that will influence this performance should be measured before any deductions and determination level of performance are imposed. Therefore, to measure the level of PFI projects performances, the establishment, and selection of an effective performance measurement tools is a necessity.

Under the PFI contract, there is usually a mechanism in which the clients in the public sectors can measure and monitor performances or qualities of service delivered by PFI contractors in comparison to the agreed standards set out in the output specification. In order to measure the performances of the projects and for applying a benchmarking approach, the establishment of suitable KPIs in PFI is essential in determining the overall success of the projects. However, lack of an effective performance measurement in PFI will be reflected from the depreciation of standards below optimum service quality of infrastructures and will contribute to the failures delivery of PPP projects (Yuan et al., 2009; Liu et al., 2013; Liu et al., 2015; Regan et al., 2011; Hodge, 2004; Yong, 2010; VAGO, 2002; House of Commons, 2003; Mladenovic et al., 2013). According to Robinson & Scott (2009), VFM in the PFI project crucially depends on performance monitoring to provide certain incentives for improvement and to ensure that the service delivery is in accordance with the client's requirement, as was set out in the output specification. Besides, the clients of the public sector can attain full VFM from the usage of assets that meets their requirements, consequently satisfying the principal objectives of the PFI procurement mechanism (Oyedele, 2013).

Even though a lot of studies on KPIs have been conducted, nonetheless, KPIs are still continuously debated. For instance; lack of clarity and understanding of KPIs for PFI projects (Lawther & Martin, 2014; Javed et al., 2013a; David & Steve, 2012) and insufficient effective performance indicators for measuring quality of the service delivery (Toor & Ogunlana, 2010; Oyedele, 2013; Javed et al., 2013b). The agreeing level of performance can determine the amount of payments or deductions from the public sector to the private sector. Consequently, if the quality of service does not achieve the minimum standards stipulated in the output specification, a payment deduction or penalties can be triggered in the form of a performance failure payment deduction (Yescombe, 2008). Therefore, this paper aims to explore the implementation of KPIs in Malaysian PFI projects by identifying the importance and challenges of the KPIs in measuring performance.

## 2.0 KPIs Implementation in PFI Projects

KPIs is defined as a more specific milestone in or components of performance measures that serves as precursors to indicate progress towards the eventual achievement of the desired performance measures (Molenaar et al., 2011). The precise definitions were elucidated by the Centre for Construction Innovation for Constructing Excellence in the North West (2006), where KPI was defined based on every single word that formed the KPI terminology. The term "key" relies on how to define when a project is successful, while "performance" means how the success is demonstrated, and "indicator" is definite on how to measure success. From the various perceptions on the meaning of KPIs, it is clearly defined that KPI is a systematic data compilation used to measure performances concerning to specific success factor.

The primary principle of PFI is the link between performance and incentive payments to the private sector based on successful delivery of services to the public sector. However, the service delivery aspects of PFI projects cannot be examined until the projects become operational (Yuan et al, 2009). During the operational phase, services delivery can frequently be measured to determine its

compliance with the output specification and payment deductions for the performance failures in accordance with the payment mechanism (Akbiyikli, 2013). In PFI projects, KPIs act as a useful tool to measure the performance of PFI projects at different levels and stages of the project. The U.K NAO (2003) acknowledged that most PFI contracts use KPIs as a benchmarking tool for contractors' evaluation with regards to service delivery.

In order to measure the performance of PFI projects, determination of appropriate KPI is important to be emphasised (Yuan et al., 2009). The used of KPIs as a performance measurement tool can be used to identify the strengths and weaknesses of PFI projects and can be applied effectively in the performance management of PFI projects (Mladenovic et al., 2013). It is supported by the study from Kagioglou et al. (2001); Mladenovic et al. (2013) and Cox et al. (2003) that, KPIs are identified as one of the popular tools used in measuring the performance of PFI projects. Therefore, they have referred the KPIs as compilations of data measures used to assess the performance of construction operations. The most prominent benefit of using KPI in PFI is its ability in benchmarking the concessionaire performance against other PFI projects, where the lessons learned from the best can be exploited to make a targeted improvement. KPIs are also competent in highlighting organisation and project weaknesses as well as capable of being the eyes and ears of the directors and lower personnel (Constructing Excellence, 2007). In conjunction with PFI for public infrastructure projects, KPIs for PFI allow greater public participation in the formation of those KPIs where it is anticipated that these KPIs assist in making PFI more significant to public needs and requirement instead of beneficial mostly to profit-driven private concessionaries (Ismail, 2009).

### 3.0 Research Methodology

This research presents the findings of the preliminary survey, which adopted the qualitative approach through a semi-structured interview. This semi-structured interview consists of several questions aimed to identify the importance and challenges of KPIs implementation in the Malaysia PFI projects. A total of 10 participants from PFI practitioners is involved in the interview process. Inputs from the experts and their views are needed in obtaining the real issues regarding KPIs' implementation in Malaysia PFI projects. The transcription and interpretation from the semi-structured interview findings will be carried out using Atlas.ti 7© qualitative software. A semi-structured interview was selected because it comprises a combination of two different types of questions namely structure and open questions (Sarantakos, 2012).

The questions for the semi-structured interview are prepared in the interview form. Semi-structured face-to-face interviews were exploited to obtain demographic data and to also determine the importance and challenges of KPIs for PFI projects in Malaysia. The instrument drafted consist of a cover page and was divided into three sections. The first section (Section A) is demographic background, which comprises of questions related to the background of the participants. The second section (Section B) consists of structured and open-ended questions to obtain the information on the critical phases throughout the life cycle of PFI projects. Meanwhile, Section C comprises of open-ended questions where participants were asked to give their opinions on the importance and challenges of KPIs implementation in Malaysian PFI projects. The initial process for the semi-structured interview is by short-listing the potential participants based on the specified pre-determined criteria. Targeted participants for this study include individuals who are involved in operational & maintenance (O&M) phase of PFI for the selected PFI projects.

### 4.0 Discussions of Analysis and Findings: Preliminary Survey

This research describes the qualitative approach namely the semi-structured interview. This analysis starts with the description of the demographic background, followed by the explanation of data analysis procedures. This research then proceeds with the analysis of data using Atlas.ti7© for determining the importance and challenges of KPI in PFI. The analysis is based on the quotations from the participants which labelled as P=Participant and Q=Quotation (P:Q) for the data interpretation.

#### 4.1 Demographic background

The demographic data gathered from the semi-structured interview (Section A), which were compiled from the participants consist of their positions in the organisation, working experience, and represented organisations. Table 1 presents the summary of the participants' demographic profile.

Table 1: Demographic background of interviewed participants (n=10).

Items	Sub-items	Frequency (n)	Percentage (%)
Stakeholders/Organisations	Public Client	8	80
	FM Contractor	2	20
Designation	Director	3	30
	Engineer	2	20
	Building Surveyor	3	30
	Quantity Surveyor	1	10
	Facility Manager	1	10
Years of Experiences	Less than 5 years	1	10
	6-10 years	7	70
	11-15 years	1	10
	16-20 years	1	10
Academic Background	Civil and Structural Engineer	3	30

Quantity Surveying	1	10
Building Surveying	3	30
Others	3	30

Based on Table 1, it shows that all of the participants' (100%) designation are from top management and practitioners (directors, engineers, building surveyors, quantity surveyors and facility managers) in the organisation with a majority of them having 6-10 years of work experiences (70%). The result indicates that majority of the respondents fit the identified criteria of participants in the interview survey. Hence, making the data obtained reliable as they came from the most appropriate respondents. According to the Akintoye et al. (2001), the involvement of top management and expert in the PFI is required since decision-making process is limited to the top management.

**4.2 Data Analysis and Findings**

Section B and C consists of structured and open-ended questions. Questions related to the critical phases of PFI projects, the issue of performance of PFI, the importance of KPI and the challenges of KPI implementation in Malaysian PFI projects were questioned to the participants. The network of Atlas.ti 7© is used to relate the participants' responses based on the listed main coding as shown in Fig. 1. It indicates that the research is focused on the implementation of KPIs for specific phases (critical phases) throughout the whole life cycle of PFI projects.

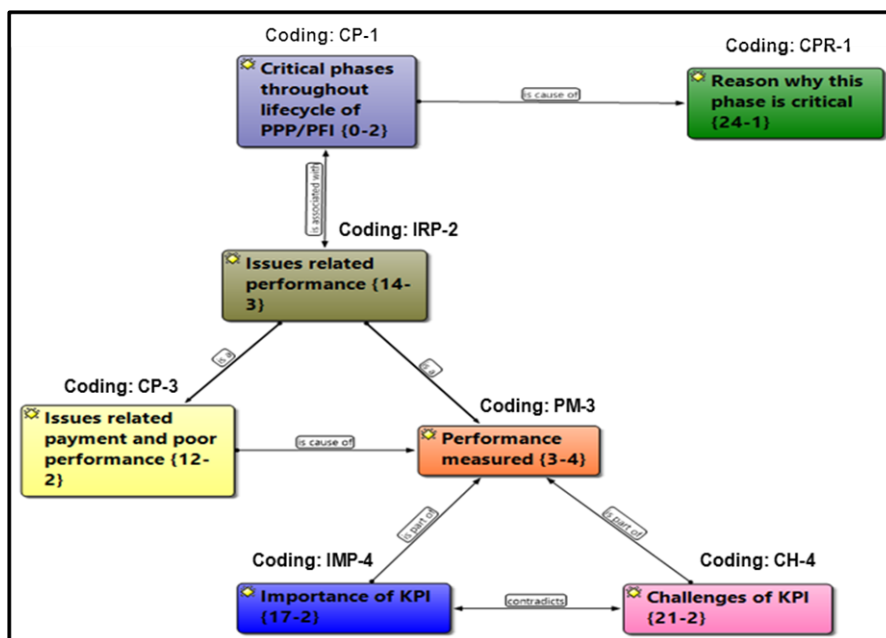


Fig. 1: Network of the Main Codings from the Interview Findings using Atlas.ti7©.

Based on the network of relationship, it is revealed that the performance (coded in IRP-2) of the PFI projects is associated with the critical phases (coded in CP-1) for the whole life cycle of PFI projects. The responses have summarised that the identified issues of performance are more related to the payment, poor performance (coded in CP-3), and performance measurement (coded in PM-3) towards the success of PFI projects. In order to measure the performance of PFI projects, an effective performance measurement tool is needed. Lack of performance measurement tools in PFI projects can cause poor performance and lead to difficulty in determining payment deduction. Therefore, an effective performance measurement tool is essential in the PFI implementation. Even though performance measurement is important (coded in IMP-4) to be executed, however, there are a lot of difficulties and challenges (coded in CH-4) to implement it effectively in measuring PFI projects performance. The further network presents the findings of the different coding, which are related to the critical phases, issues related to performance, the importance of KPIs and the challenges of KPIs.

**4.2.1 Critical phase throughout the life cycle of PFI projects**

Fig. 2 presents the critical phase throughout the life cycle of PFI projects. The purpose of this section is to identify the critical phases of the PFI projects throughout their whole life cycle. In this section, structured and open-ended questions relating to the critical phase throughout entire life cycle of PFI projects were asked to the participants. This section allowed further questions to be asked as this interview session is designed based on semi-structured interview structuring. Based on the network of relationship, all the participants (100%) revealed that the operational and maintenance (O&M) phase is the most critical throughout the whole life cycle of PFI projects in comparison to the other phases. There are five reasons discovered from this interview session. The O&M phase involved a lengthy period of concession throughout the life cycle of PFI projects. It was the first reason, and the answer was provided by Participant 1 in Quotation 7 (P1:Q7), and this response was supported by other participants with the similar point of views (P4:Q2, P5:Q2, P10:Q3). The second reason is the involvement of end users and clients at this O&M phase. This quotation was provided by Participant 6 in

Quotation 2 (P6:Q2). The third reason is on the payment to the concessionaire. Contractually, this payment to the concessionaire is paid at the beginning of this O&M phase. There is no payment paid to the private concessionaire before entering this phase. This quotation was provided by Participant 1 in Quotation 6 and this answer was supported by the other participants who represent 5 participants out of 10 total of participants in their quotes (P2:Q2, P5:Q4, P9:Q6, P10:Q2, P10:Q4). The next reason is the responsibility and risk transfer during services delivery. This quotation was stated by the Participant 2 in Quotation 2 (P2:Q2) and was agreed by other participants who represent 4 out of 10 participants in their quotations (P5:Q3, P8:Q6, P8:Q3, P9:Q5). Lastly, Participant 3 in Quotation 2 (P3:Q2) and Participant 3 in Quotation 3 (P3:Q3) has stated that the involvement of building maintenance at this phase makes it the phase is more critical.

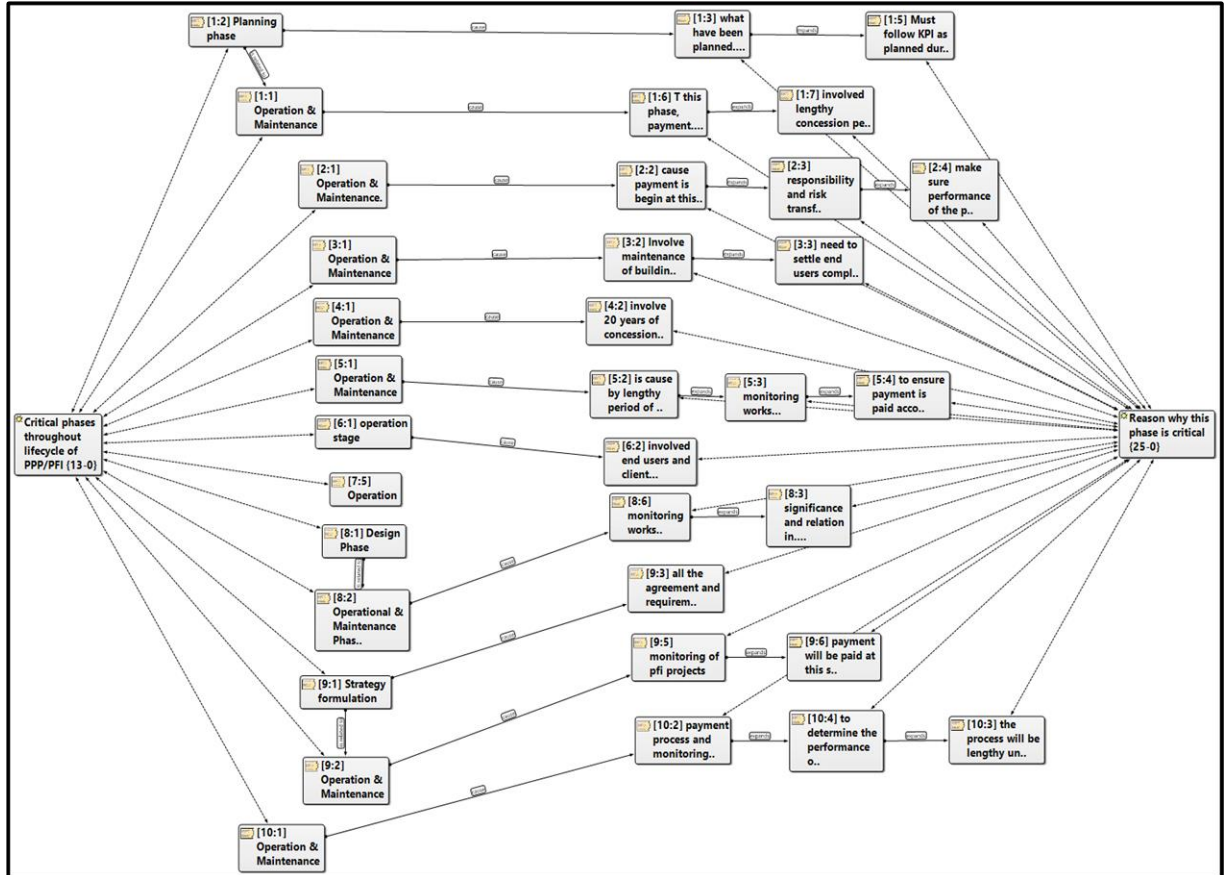


Fig. 2: The critical phase throughout the life cycle of PFI projects.

Based on a network of relationship, it was discovered that operational and maintenance (O&M) phase is the most critical throughout the life cycle of PFI projects in comparison to the other phases. The coding was verified by the participants in their quotations as discussed above. In line with the literature, most of the researchers agreed that the operational stage is obviously among the longest period during the PFI contract where the period is varied between 20-40 years (Wang, 2011; Akbiyikli & Eaton, 2006; Yescombe, 2007). Therefore, the O&M phase is identified as the most important phase of the service delivery and payment conditions are created at this phase (Akbiyikli & Eaton, 2006).

#### 4.2.2 Performance issues in PFI projects

Fig. 3 presents the findings in determining the issues of performance in PFI projects in Malaysia. According to Liu et al. (2015), during the life cycle of PFI projects, the performances could be affected by a number of factors and their interactions, all of which might result in the inefficiency and ineffectiveness of the projects. It is supported by Isa et al. (2016) in his study where he claimed that one of the factors that contribute to the poor project performance is on building defects in PFI projects. The other factors are complaints from users on inadequate facilities and services provided; low-level end users' satisfaction (Universiti Teknologi MARA, 2016; 2015); and conflict between payment and measuring performance (Oyedele, 2013; Yescombe, 2008). These factors will affect the payment process where deduction will be imposed on the poor or low level of performance standard achieved by the private concessionaire.



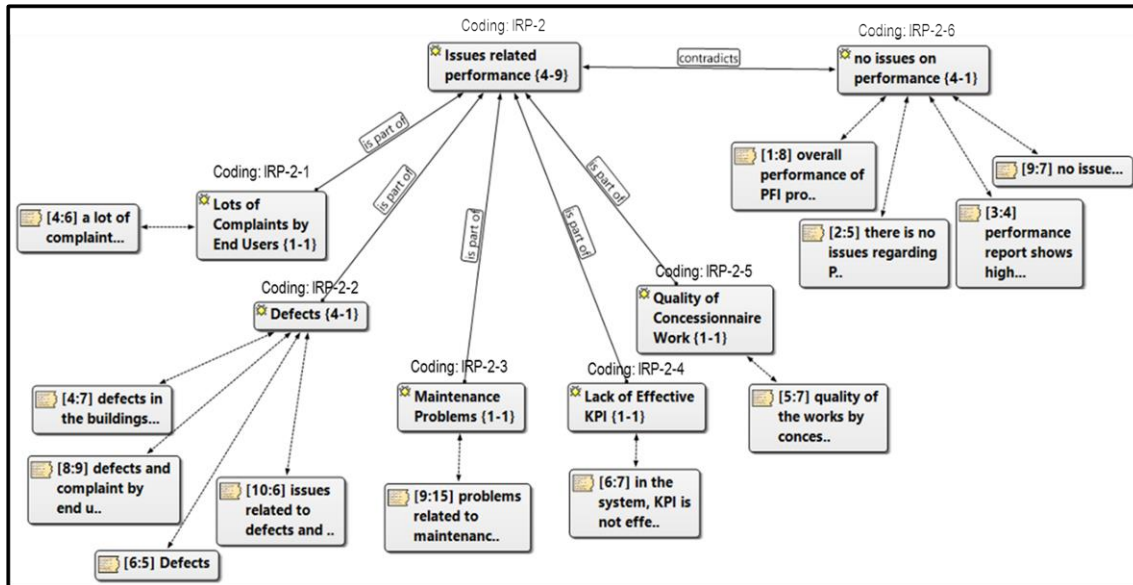


Fig. 3: Performance issues in PFI projects.

Based on the networking, the responses have summarised that performance of PFI will be affected by several factors. The first factors are a lot of complaints from the end users (coding IRP-2-1) as stated by Participant 4 in Quotation 6 (P4:Q6). The second factors are related to defects (coding IRP-2-2) which provided by Participant 4 in Quotation 7 and were supported by other participants (P6:Q5, P8:Q9, P10:Q6). The third factors are regarding maintenance problems. This answer was provided by Participant 9 in Quotation 15 (P9:Q15). The other factors related to performance issues are lack of effective KPIs to measure and monitor the performance of PFI. This answer was provided by Participant 6 in Quotation 7 (P6:Q7). Finally, the factors identified are related to the quality of the concessionaire works as perceived by Participant 5 in Quotation 7 (P5:Q7). All the factors identified and discussed among the participants can lead to the poor performance of PFI projects.

Even though there are a lots of factors contributing to poor performance of PFI projects as discussed among the participants, however, it is contradicted with the responses by Participant 9 in Quotation 7 (P9:Q7) which indicated that there is no issue on PFI project performance since the overall result of project performance is at a satisfactory level. The coding was verified by the other participants in their quotations (P2:Q5, P3:Q4, P1:Q8). The probable reason may be due to the background of the participants and their involvement in the PFI projects. Based on the demographic background of the participants, Participant 1 and 9 are from the government sector, where they are not directly involved in the O&M phase because they only monitor the progress of the PFI projects by reviewing the submitted technical team report. Following are Participant 2 and 3 who are from the private sector where they are directly involved in the O&M phase and people who are responsible for carrying out the works. These contradicting responses by the participants are due to the different perceptions and their judgements of the works. Different understanding may occur and consequently can contribute to various perceptions on the level of performance. Therefore, there is a need to standardise and establish a mechanism to assess this performance as perceived by Participant 6 in Quotation 7 (P6:Q7) that a lack of KPI can affect the payment process and can further lead to the poor project performance.

The findings show that there are several factors lead to the failure and poor PFI projects performance in Malaysia. The identified factors are parallel with previous studies discussed among the researchers by Isa et al. (2016); Universiti Teknologi MARA (2016; 2015), Oyedele (2013); Yescombe (2008), which stressed on the defects, complaints from end users on inadequate facilities and services provided; low level of end users' satisfaction and conflicts between payment and measuring performance. The results illustrate that the occurrence of performance issues in PFI projects requires thorough improvement, as it may contribute to the poor project performance and can affect the payment process to the concessionaire. This is supported by UKAS (2009); Yuan et al. (2009); Ernst & Young (2008), who described PFI's characteristics is that the payment for the services is based on pre-determined standards and performance. Therefore, the private concessionaire is paid to deliver the services according to the required quality and performance level. Hence, KPIs are identified as a tool to measure the performance of PFI projects in Malaysia.

#### 4.2.3 Importance of KPIs in PFI projects

In this section, open-ended questions were asked to the participants to get their views on the current KPIs implementation in Malaysia PFI projects specifically for the O&M phase. Fig. 4 presents the findings on the importance of the currents KPIs implemented in the PFI projects. Based on the network of relationship, all of the participants mentioned that KPIs is used as a performance measurement tool to measure the performance of O&M phase in the PFI projects. Therefore, it is essential to get some views on the current KPIs mainly in terms of the importance of KPIs implemented in the PFI projects.

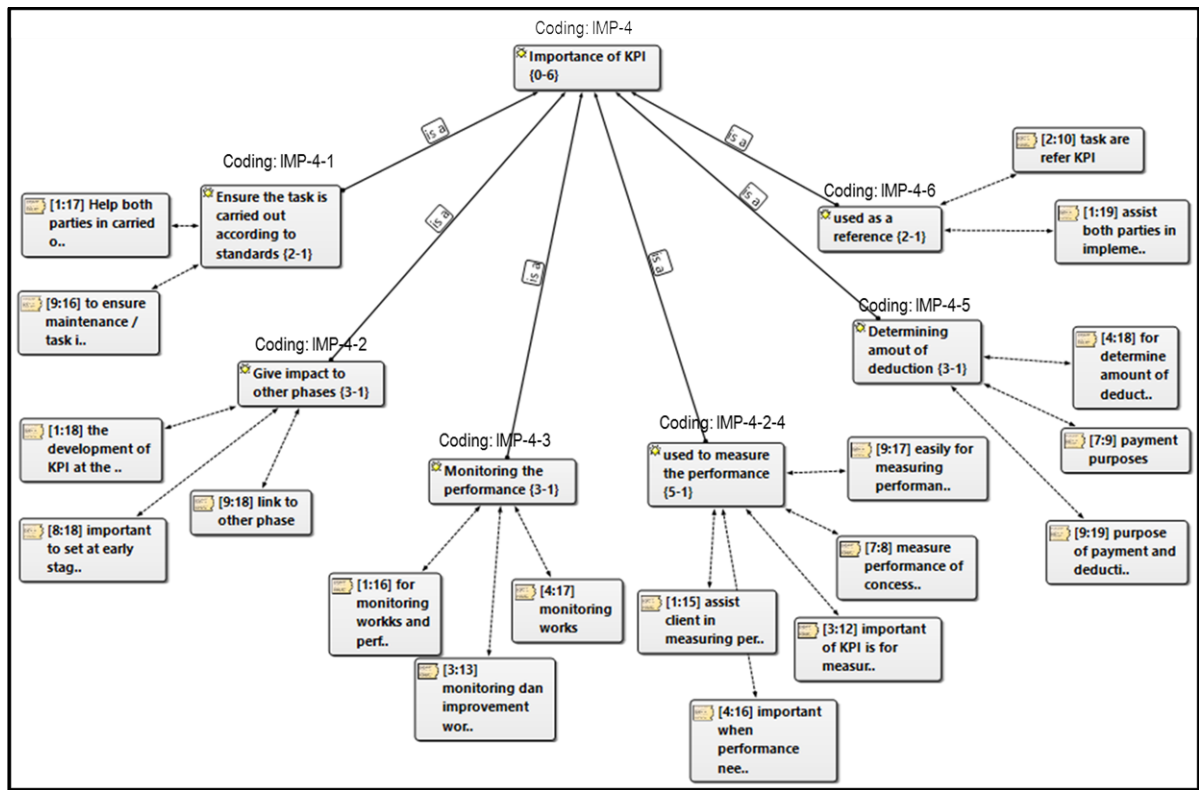


Fig. 4: Importance of KPIs implementation in PFI projects.

Based on the network, the responses have indicated that the importance of KPIs are to ensure that all the services and facilities provided by the private concessionaire are carried out according to the standard and KPIs as stipulated by the government (coded in IMP-4-1). This coding was verified by Participant 1 in Quotation 17 (P1:Q17) and supported by Participant 9 in Quotation 16 (P9:Q16). The importance of developing and establishing KPIs at the early stage (strategy formulation phase) can influence and give an impact to the implementation of other phases especially for O&M phase (coded in IMP-4-2). This coding was proved by Participant 1 in Quotation 18 (P1:Q18) and a shared point of views with Participant 8 in Quotation 18 (P8:Q18) and Participant 9 in Quotation 18 (P9:Q18). Furthermore, KPIs is also crucial to be implemented in the O&M phase because, at this phase, the performance of the concessionaire needs to be monitored and improved to achieve VFM (coded in IMP-4-3). These quotations were discovered from Participant 1 in Quotation 16 (P1:Q16), Participant 3 in Quotation 13 (P3:Q13) and Participant 4 in Quotation 17 (P4:Q17). In addition, KPI is used to measure the performance of PFI projects (coded in IMP-4-4) as indicated by Participant 3, Quotation 12 (P3:Q12) and has been supported by others participants in their quotations (P1:Q15, P4:Q16, P7:Q8). KPIs is also important in determining the amount of deduction before any payment can be made to the concessionaire (coded in IMP-4-5). This coding was agreed by 3 out of 10 participants with their quotations during the interview session (P4:Q18, P7:Q9, P9:Q19). The other importance of KPI perceived by Participant 2 in Quotation 10 (P2:Q10) and Participant 1 in Quotation 19 (P1:Q19) is that KPIs can be used as a reference in carrying out the maintenance work and can also be referred by both parties (private and public sector) when dealing with O&M works.

The findings showed that there are several factors identified on the importance of KPIs that helps in measuring and monitoring the PFI projects performance. According to Akbiyikli (2013) in their study stated that during the O&M phase, services delivery could frequently be measured to determine its compliance with the output specification and payment deductions for the performance failures in accordance with the payment mechanism. This PFI project performance can be measured using KPIs as perceived by Yuan et al. (2009). It is supported by Kagioglou et al. (2001); Mladenovic et al. (2013) and Cox et al. (2003) which mentioning the KPIs as one of the popular tools used in measuring the performance of PFI projects. As current implementation of PFI in Malaysia, KPIs is identified as a useful tool for measuring and monitoring the PFI projects performance specifically at the O&M phase as regard to the service delivery and facilities provided by the concessionaire. Thus, KPIs need to be well established at the early stage because it should reflect the goals of the other phases especially O&M phase as identified as a critical phase as agreed by Yuan et al. (2009) and Akbiyikli (2013).

#### 4.2.4 Challenges of KPIs in PFI projects

Even though the importance of the KPIs has been identified in the previous section. However, the implementation of KPIs is still not effective. It is due to several challenges faced by the stakeholders in implementing this KPI that can lead to poor and failure project performance. These challenges can affect the implementation of PFI projects, and further, it can lead to poor PFI projects performance.

Fig. 5 shows the network of relationship for the identified challenges of KPIs in PFI implementation (coded in CH-4). The first factor identified from the interview session is that the existing built KPIs is too general. This quotation was provided by Participant 5 in Quotation 10 (P5:Q10) and verified by most of the participants involved in the interview session (P7:Q6, P6:Q3, P8:Q5, P10:Q10, P8:Q10). The next factors as revealed by the participants is on the contents of KPIs. The current KPIs are too vague (coded in CH-4-2). This coding was verified by 3 out of 10 participants with their quotations (P2:Q9, P3:Q10, P8:Q11). Further, the existing KPIs used for the PFI projects are difficult to understand (coded in CH-4-3). The answer was provided by Participant 3, Quotation 11 (P3:Q11). The importance of implementing KPIs in PFI is to measure the performance of PFI project. However, the current KPIs in practice as perceived by the Participants 7 in Quotation 7 (P7:Q7) is difficult to be measured (coded in CH-4-4). It is due to the weakness, and some of the KPIs is not practical to be implemented in practice. This statement falls under coding CH-4-5. It was verified by Participant 8 in Quotation 13 (P8:Q13) and supported by other participants in their quotations (P8:Q14, P8:Q15, P6:Q4, P6:Q7, P4:Q15). The implementation of KPIs also depends on the other documents (coded in CH-4-6). This quotation was provided by Participant 9, Quotation14 (P9:Q14). There is a relationship between KPI, the concession agreement, and output specifications. Therefore, development of KPI at the early stage is very crucial because it links with other documents when entering the other phase of PFI projects.

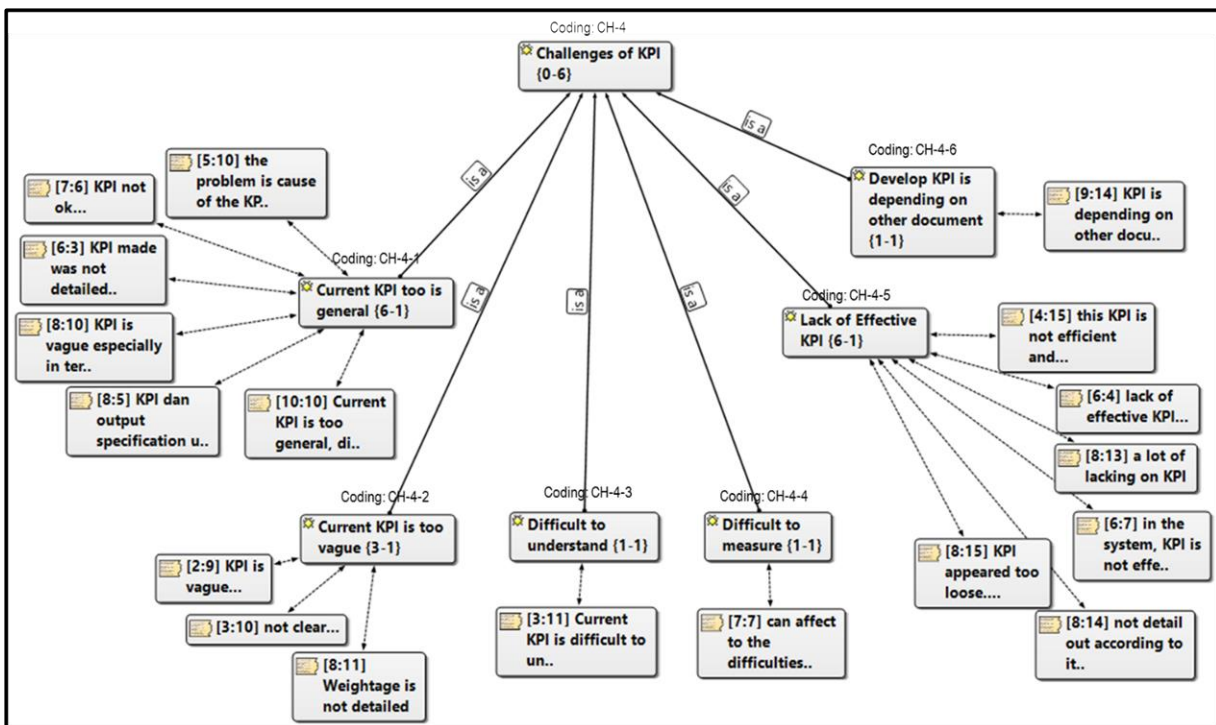


Fig. 5: Challenges of KPIs implementation in PFI projects.

From these identified challenges, it shows that the current KPIs do not meet the criteria that caused difficulties in measuring and monitoring the performance of PFI projects. Therefore, there is an importance to select and develop effective KPIs according to the criteria in selecting good indicators.

Even though several studies on KPIs have been conducted with the aim of improving the performances, but KPIs are continuously being debated (Ismail, 2012; Khaderi & Aziz, 2010). The findings on the challenges in KPIs implementation were identified and it showed that the current KPIs are lacking in fulfilling the criteria of a good indicator. These identified challenges are parallel with the previous studies by David & Steve (2012); Lawther & Martin (2014); Javed et al. (2013b); Toor & Ogunlana (2010), which indicated that KPIs is lack of clarity, difficult to understand, too complicated and some KPIs are too general. These factors will lead to the failure and poor projects performance. The findings illustrate that there is a need to establish an effective KPI for measuring and monitoring the performance of PFI projects to accomplish the project goals and VFM. In relation to that, the development of KPIs should be actively applied to measure performance towards the achievement of certain goals (Shahin & Mahbod, 2007). Hence, the results support the justification to establish effective KPIs as a measuring tool by considering the important criteria to be embraced when selecting KPIs to ensure more relevant KPIs can be constructed and can be used effectively and efficiently.

## 5.0 Conclusion

This paper has presented the qualitative research on the implementation of KPIs in Malaysia PFI projects. It shows that the implementation of KPIs in PFI is an urgent issue to be resolved as this will affect the performance of PFI where it involves a lengthy period of concession. In addition, it has also documented the above findings on the identification of the factors affecting PFI projects



performance, and the importance and challenges of KPIs implementation in Malaysia PFI projects. The O&M phase is identified as the most critical phase in PFI projects' implementation and thus, it is crucial to be emphasised. The determination of factors causing the poor performance, the importance and challenges of KPIs will help the stakeholders to improve the current performance measurement tool and simultaneously can enhance the credibility of the public in measuring the PFI projects performance. In addition, it can also improve clients' satisfaction and gain the best VFM. Therefore, it is vital for the Malaysian Government to develop an effective performance measurement tool for measuring PFI projects performance especially for the critical phase of O&M that involved a lengthy concession period (25-30 years).

The research presented in this paper is initially and a part of an ongoing PhD research at the Faculty of Architecture, Planning and Surveying, UiTM to develop a performance measurement tool for PFI projects in Malaysia. The result of the study will provide an insight into the Malaysian construction project development and form the basis of a valuable guideline, especially to the public and private sectors in Malaysia.

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