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Factors Affecting the Operational Performance of Public Private Partnership (PPP) Projects: Cases in Malaysia

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Abstract

The Implementation of Public Private Partnership (PPP) Programme in Malaysia aims to improve the delivery of infrastructure facilities and services for the public sectors. Hence, it is vital to ensure the success of PPP projects by monitoring the projects' performance to earn value for money (VFM). However, there are several factors influencing the PPP projects' performance as deliberated by previous scholars. Among these factors are lack of building facility management, lack of performance measurement systems and low monitoring levels which would affect the success of PPP projects especially at the operational stage. Therefore, the purpose of this research is to determine the factors affecting the operational performance of PPP projects in Malaysia. A qualitative approach of semi-structured interviews from selected case studies was adopted. A purposive sampling technique has been chosen which involves PPP experts as a sample population. The data was analysed using Atlas.ti8© qualitative analysis software. From the findings, authors revealed eight factors contributed to the poor projects' performance namely; defects occurrence, lack of competency among staff or person in charge in PPP, service delivery failure, lack of strategy in assessing performance, lack of monitoring, lack of experience and understanding of PPP among stakeholders, and poor management. The findings of this study may benefit practitioners to further improve the operational performance by eliminating or minimizing factors that affect the successful implementation of PPP projects in Malaysia.

Keywords: Operational Performance, Operational & Maintenance, Public Private Partnership.

1.0 Introduction

The Public Private Partnership (PPP) is one of the procurement methods that has been applied widely in global construction market, including in Malaysia. Malaysian government has officially publicised the PFI approach under PPP programme in the Ninth Malaysian plan in 2006 which has become the kernel for the overall implementation of PPP in Malaysia. While, in eleventh Malaysia Plan, the private investment is the prime of economic growth ain Tenth Malaysia Plan. The concept of this scheme is to promote a contractual relationship between

public sector as a client while private sector as an asset creator and service provider respectively.

As stated by Robinson & Scott (2009), the key principle of PPP is the relationship between incentive payments and performance to the private sector based on the successful services and facilities provided to the public sector throughout a whole life cycle of a project. Since it has a significance relationship, the private sector must be able to provide high quality services as required by the standard in terms of level, quality and timeline (Hashim, 2017). Hence, performance monitoring is vital to be enforced by both parties (public and private) to ensure that the VFM is earned.

In conjunction with this, FM contractors need to design a comprehensive plan to accommodate long-term public infrastructure and services. Even though a lot of initiative are being made by the PPP stakeholders to improve the performance of PPP projects, however there are numerous factors which might cause the inefficiency and ineffectiveness of these projects' performance. For instance; defects occurrence (Lop et al., 2017; Isa et al., 2016; Universiti Teknologi MARA, 2016); complaints from users on poor facilities and services provided; low level of users' satisfaction (Lop et al., 2017; Universiti Teknologi MARA, 2015; 2016); and conflict between payment and measuring performance (Oyedele, 2013; Yescombe, 2008). These factors can contribute to the PPP poor projects' performance and consequently will affect the payment process. In this circumstance, payment deduction will be imposed to the concessionaire for low level performance standard achievement (Oyedele, 2013). As reported by the NAO (2010), service failure and poor performance in maintenance works are frequently reported within PPP projects in the UK and Australia. This result leads to the poor PPP project implementation and consequently failed to achieve VFM.

Despite, a lot of studies on PPP implementation have been conducted with the aim to improve the performances, nonetheless, the contributing factors that affect the PPP performance at specific O&M phase have been less discussed. Past studies also inclined towards identifying success factors, however, there is lack of discussion by previous researchers to identify the failure factors that lead to the poor projects' performance. Therefore, the determination of the factors that affect the operational performance of PPP projects is crucial. Thus, this research presents one objective which is to determine factors affecting the operational performance of PPP projects. This research findings will provide valuable insights on ways to improve the performance of PPP projects in order to achieve VFM.

2.0 Literature Review

2.1 Public Private Partnership (PPP) Project Performance

PPP implementation in Malaysia have several distinguish aspects, which benefits to the government and end users such as facilitate creative, innovative approaches and enhancing

local economic. Through this PPP approach, Malaysia has experienced many successful projects under economic infrastructure projects that can benefit the public, such as; KL Sentral, Light Rail Transit (LRT), many highways, bus stations and others. With this success, Malaysia has allocated a total amount of budget to develop social infrastructure projects using the same PPP scheme, for instance; school, universities, hospital and others. Currently, most of the PPP projects implemented in Malaysia under social infrastructure are operated under operational and maintenance (O&M) phase. Although this PPP project has been successfully implemented by the government, there are also constraints that prevent a successful implementation of PPP projects in which projects' performance does not reach the standard and cause VFM is not realized. There are several issues experienced by the Malaysian government that prevent the successful implementation of PPP for instance; lack of strategy on the assessment of PPP projects' performance, the existence of building defects, and low level of end users' satisfaction (Universiti Teknologi MARA, 2015; 2016; Isa et al., 2016; Lop et al., 2017).

The concept of PPP in Malaysia is identical with the current PPP worldwide which is emphasizes on transfering of risk. The implementation of PPP is also intended to create a structure in which improved VFM's achievement and management skills in delivering significant projects' performance (Boussabaine, 2007). In this context, maintaining the performance is essential to ensure the services and facilities provided are fully functioned until the projects handed over to the client. The effectiveness of performance monitoring cannot be fully assessed until PPP projects become operational (Robinson & Scott, 2009; Lop et al., 2017).

In practice, as referred to the Asset Management Services Manual for PPP project, all requirements and policies that had been stated by the government must be complied by the concessionaire. The Concessionaire must carry out day-to-day a comprehensive maintenance operation of the PPP during the period of consensus which had been approved by the government. Clearly, the primary responsibility of the concessionaire is to manage all the maintenance works (facilities) within stipulated concession period. In conjunction with that, performance of the PPP projects would be examined throughout the whole life cycle projects. There are several phases involved throughout PPP project life cycle for instance; (1) strategy formulation phase; (2) Procurement phase (3) construction and (4) operational and maintenance (O&M) phase. Usually, the performance of PPP projects is significant to be examined when the projects was entered the O&M phases (Wang, 2011; Ismail, 2012; Takim et al., 2008; English et al., 2010; Kamara, 2012; Lop et al., 2016).

Naturally, each of the phases has its own characteristics and goal to be achieved. O&M phase is identified as one of the critical phases throughout the life cycle projects based on the goal to be achieved. It is asserted by Wang (2011); Akbiyikli & Eaton (2006); and Yescombe (2007) in their studies that the operational stage is obviously critical due to the longest period during the PPP contract. It is differ from one project to another project which the specified concession period is varies between 20-40 years. In addition, Akbiyikli & Eaton, (2006) revealed that, this O&M stage is the most important phase since the service delivery and payment

mechanism are created here. Payment will be deducted if the performance does not achieve the quality and standard as stipulated in the concession agreement (Akbiyikli & Eaton, 2006). Therefore it is necessary to ensure the success of the operational performance during this stages due to the notion of performance based payment.

2.2 Factors Affecting the Operational Performance of PPP Projects

According to Mladenovic et al. (2013) and Liu et al. (2015), the PPP project's performance could be affected by a number of factors and their interactions during project's life cycle. Thus, a well-defined performance criteria and objectives from different stakeholders needed in order to develop a systematic performance management system (Yuan, 2008). Rockart (1982) stated that critical success factors (CSFs) could be the pillar to achieve PPP project's goal and simultaneously attain VFM. Therefore, to ensure the success of a project, achieving high-level project performance must be given priority.

Nowadays, an issue about the success factors of the PPP projects is often discussed among the previous researchers aiming to attain VFM (Liu et al., 2014; Osei-Kyei & Chan, 2015). Unfortunately, there is a less attention discussion on the the factors that hinder the success of the PPP projects particularly for the O&M phase. From the previous discussion among the researchers globally, there are several factors that have been identified as the potential causes that affect the operational performance of the PPP projects. These identified factors have been divided into five main groups, namely; assessment factors, management of PPP, maintenance factors, project team efficiency and asset risk and stakeholder's satisfaction as summarize in table 1.

2.2.1 Assessment Factors

As mentioned earlier, the concept of PPP is corncerning performance based payment. Thus, a concessionaire will be paid if they performs better and achieves the standard agreed by both parties. Thus, Yuan et al. (2008) suggested that accurate assessment of performance could be attained only after the key performance indicator (KPIs) were determined and monitored. KPIs defined as a tool of attribute to assess the effectiveness and evaluate the performance of PPP projects with regards to the agreed quality and standard (Mladenovic et al., 2013). As asserted by Oyedele (2013), before any payment can be made to the concessionaire, the first thing must be considered in assessing the performance of the projects is to ensure the quality and standard are achieved. Payment deduction will be imposed if the concessionaire failed to meet the standard as agreed by both parties. In some other cases, PPP projects' performance is difficult to be measured in which ultimately poses a payment conflict (Hashim et al, 2017; Lop et al., 2017). All these factors indirectly will affect the operational performance and the implementation of the PPP projects.

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Table 1: Variables of factors affecting the operational performance of PPP

Factors	Sub-factors	Authors
Assessment Factors	• Payment deduction imposed to the concessionnaire • Lack of effective KPI • Conflict between payment and measuring performance	Oyedele (2013); Lop et al. (2017); Hashim et al. (2017)
Management of PPP	• Insufficient briefing from clients/public sectors • Lack of trained manpower. • Lack of implementation guidelines • Poor project's planning	Carrillo et al., (2006); Bannan et al. (2012); Hashim et al. (2017); Akintoye et al. (2003)
Maintenance Factors	• Failure of the concessionaire to carry out the facility properly. • Issues which are related to the interaction with the hard FM • A lot of building defects identified for the PPP projects even though all the services and facilities are maintained by the concessionaire. • Maintenance problems cause of lacking on monitoring work • Quality of the concessionaire's works • Complaints from users on poor facilities and services provided	Karim & Alkaf (2011); Cartlidge, (2006); Isa et al. (2016); Universiti Teknologi MARA (2016; 2015); Lop et al. (2017); Hashim et al. (2017)
Project Team Efficiency	• Level of experience which is different between individuals from private concessionaires and public sectors. • Lack of expertise to implement PPP projects • Shortage of staff to carry out monitoring works • Public sectors have significantly less staff and they lack of PPP experiences lead to private concessionaires have to 'educate' their clients. • The issues on the high dependency by the SPV on the government although the project had being private sector driven	Carrillo et al., (2006); Universiti Teknologi MARA (2016; 2015); Bannan et al. (2012); Karim & Alkaf (2011)
Aset Risk and Stakeholder's satisfaction	• Asset risk-risk associated with the design and construction will affect the operational phase • Low level end users' satisfaction / stakeholder's satisfaction	Hashim et al. (2017); Lop et al. (2017); Akintoye et al. (2003)

2.2.2 Management of PPP

According to Akintoye et al. (2003), the studies emphasized on issues concerning the work's performance by concessionaire throughout the operational phase of the contract. One of the factors highlighted is the difficulties in determining the quality of service and management services delivered by the concessionaire. For example, difficulty in determining level of hygiene associated with cleaning service performance. This is due to the poor planning at the early stage where details on cleaning service is not described clearly. This was agreed by Carrillo et al. (2006) that insufficient briefing from clients during preparation of contract at the early stage will affect the implementation of PPP projects at the O&M phase. Lack of implementation guidelines as revealed by Hashim et al., 2017 also lead to the poor projects implementation and ultimately will affect the performance of the PPP projects as a whole.

Another factor that affects the project performance is regarding lack of trained manpower during the implementation of PPP projects (Lop et al., 2017; Bannan et al., 2012). Concessionaires (management level) are responsible to provide well-trained manpower to carry out the maintenance works during the operational phase. It is vital to ensure the work delivered are according to the KPIs as stipulated in the contract.

2.2.3 Maintenance Factors

Service failure was often reported within PPP projects where the liabilities of the failure were taken under responsibility of the facility management company. According to Karim & Alkaf (2011) failure of the concessionaire to carry out the facilities work can cause the performance of the project affected. Furthermore, another factor leading to the failure of PPP projects as revealed by Karim & Alkaf (2011) is regarding the system itself where the PPP system is not functioning appropriately. It is due to the concessionaire's failure to recognize the potential disaster means during the initial stage of construction, which may lead to the problematic on the PPP implementation during the operational phase. This will affect the quality of concessionaire work (Lop et al., 2017).

In the PPP contract, service delivery and operations could range from hard FM services (fabric maintenance, mechanical, and electrical services, etc.) to soft services (cleaning and housekeeping, site security, central switch board services, etc.) depending on the nature of the project (Robinson & Scott, 2009). The maintenance operations are expected to comply with the output specification using a variety of maintenance service regimes. These include planned and unplanned maintenance services (Wiggins, 2010). Even though all the services and facilities are well maintained by the concessionaire, the project still has a lot of building defects that will eventually affect the performance of the PPP project (Isa et al., 2016; Universiti Teknologi MARA, 2016; 2015; Lop et al., 2017; Hashim et al., 2017). Building defects can be demarcated as a failure or shortcoming in the building's function and performance and this may occur in its structure, fabric, services or other facilities (Isa et al., 2016). Failure to address defects and

complete the rectification within the prescribed time frame would prevent the smooth operation of the building and simultaneously reduce life span of the building.

2.2.4 Project Team Efficiency

Agrawal (2010) mentioned that a strong and capable project team is crucial for the success of PPP project implementation. It can be related to the shortage of staff in monitoring the projects performance as revealed by Bannan et al. (2012) and Carrillo et al. (2006). It directly gave an impact to the efficiency of PPP project management. However, lack of expertise in implementing PPP projects as discussed by Carrillo et al. (2006) can cause the project team turn out to be inefficient. Moreover, the different level of experience between individuals from private concessionaires and public sectors also contributed to the poor projects implementation. Another factor related to the efficiency of the project team is the high dependency of the concessionaire on the government although the project had being private sector driven (Carrillo et al., 2006). This phenomenon shows that the concessionaires are not capable of implementing this PPP project.

2.2.5 Asset Risk and Stakeholder's Satisfaction

Other factors as revealed by Hashim et al. (2017); Akintoye et al. (2003); Lop et al. (2017) are on asset risk and stakeholder's satisfaction. Most of the factors are stressed on the satisfaction level of end users against the PPP projects' performance. Principally, the performance of the PPP projects is substantially related to both stakeholders' satisfaction and their contribution towards projects' performance. In PPP projects, the level of stakeholders' satisfaction need to be measured for determining the level of project's performance (Lop et al. 2017). However, low level of end users' satisfaction will demonstrate the real situation of the PPP project's performance.

Hashim et al. (2017) in their study also revealed that the asset risk in the PPP projects are among the challenges where the risk is associated with the design and construction. Nevertheless, the poor planning in designing and maintaining the assets at the early stage will affect the operational phase.

3.0 Research Methodology

This research presents the findings of the main survey, which adopted the qualitative approach through a case study via semi-structured interview. A semi-structured interview was selected because it comprises a combination of two different types of questions namely structure and open questions (Sarantakos, 2012). This semi-structured interviews were conducting via face-to-face interview aimed to expoited demographic data and factors affecting the performance of PPP project in malaysia.

The initial process for the semi-structured interview is by short-listing the potential participants based on the specified pre-determined criteria. The pre-determined criteria was set in order to shortlist the projects as part of the case studies. Four PPP projects in Malaysia were selected as case studies. Targeted participants for this study include individuals who are involved in operational & maintenance (O&M) phase of PPP within the selected case studies. Hence, a total of 10 participants from four case studies (experts) from different stakeholders were involved in the interview process. Although the sample size is slightly small, the in-depth nature and detailed explanations of the issues provided by experienced interviewees adequate as recommended by Romney et al. (2009) in their study that samples size of four to six interviews when interviewees have an expert knowledge in the area of study is adequate for the study. Therefore, inputs from the experts and their views are needed in obtaining the real issues regarding PPP implementation in Malaysia. The data gathered from the semi-structured interview was analysed using Atlas.ti8© qualitative software.

4.0 Analysis and Findings

This analysis begin with the description of the demographic background proceeds with the analysis of data using Atlas.ti8©. 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 Profile of Interview Participants

The demographic data gathered from the semi-structured interviews, which were compiled from the participants consist of their positions in the organisation, working experience, and represented organisations. Table 2 presents the summary of the participants' demographic profile. The result shows that 60% of the interviewees are from public clients and the remaining 40% are private concessionaires (Facility Management Contractor). Both stakeholders are contracting parties for 20 years period of concession.

Table 2: Demographic background of interviewees (n=10).

Items	Sub-items	Frequency (n)	Percentage (%)
Stakeholders/Organisations	Public Client	6	60
	FM Contractor	4	40
Designation	Engineer	5	50
	Building Surveyor	1	10
	Facility Manager	4	40
Years of Experiences in PPP Projects	Less than 5 years	1	10
	6-10 years	7	70
	11-15 years	1	10
	16-20 years	1	10

The purposive sampling technique was employed in the study and the selection of participants was selected for who directly involved in the PPP projects. It is due to the maturity of the PPP project in Malaysia. As Harwell (2012) mentioned, qualitative research strategies aim to underline the truth, consistency, and lack of bias. For the sake of reducing the chances of biases in the analysis of the findings, the perceptions of different stakeholders are taken into account. All of the participants' designation (100%) are top management (engineers, building surveyors, and facility managers) in the organisations. The result indicates that all of the respondents are met the specified criteria as a participants in the interview survey. According to the Akintoye et al. (2001), the involvement of top management and expert in the PPP is required since decision-making process is limited to the top management.

The result shows that 90% of the participants have experience in the PPP projects of six to twenty years. Therefore, it can be concluded that this study had provided a wide range of personnel in terms of experiences since the participants involved had a broad area of knowledge in the construction projects specifically in the PPP approach. This statement proves that the level of perception significantly relied upon experience in the construction industry.

4.2 Analysis and Discussion of Interview Findings: Determining factors affecting the operational performance of PPP projects.

Figure 1 shows the network for factors affecting the operational performance of PPP projects. The first factor identified from the interview session is *defects occurrence*. This factor was identified as a main issue in PPP projects during the O&M phase. This coding was provided

by Participant 1 in Quotation 2 (P1:Q2) and was verified by other participants involved in the interview session (P2:Q2, P6:Q4, P7:Q4, P10:Q1, P10:Q2). The identified factor is parallel with previous studies discussed among the researchers by Isa et al. (2016); Universiti Teknologi MARA (2016; 2015); Lop et al. (2017) and Hasim et al. (2017), which stressed on the issue of defects in PPP projects that influence the building's function and performance of the projects.

The second factor as revealed by the participants (P5:Q3, P7:Q1, P8:Q2) is lack of competency among staff or person in-charge in the PPP projects. Competency as mentioned by the participants concerning the communication, cooperation and staff assigning for these projects are not performing well. This phenomenon may contribute to the poor project implementation and simultaneously affect the projects' performance. This is in line with the study by Carrillo et al. (2006) which mentioned that lack of experience in managing and maintaining the facilities can cause the project team turn out to be inefficient.

The third factor discovered from these participants is regarding the *service delivery failure.* This coding was verified by 2 participants out of 10 participants with their quotations (P5:Q1 continued with Quotation 2, P4:Q3). Participant 5 in Quotation 2 (P5:Q2) discovered that, the actual building physical is not reflect the reported level of performance in PPP projects. This statement was supported by Participants 4 in Quotation 3 (P4:Q3) which revealed that there are a lot of complaints on the condition of air-conditioning units which are not functioning well. This is concessionaire's responsibility to ensure the services and facilities are delivered in good condition and according to the agreement. The impact of non-compliance with the agreement if failed to deliver good services and facilities can lead to the payment deduction imposed to the concessionaire (Lop et al., 2017).

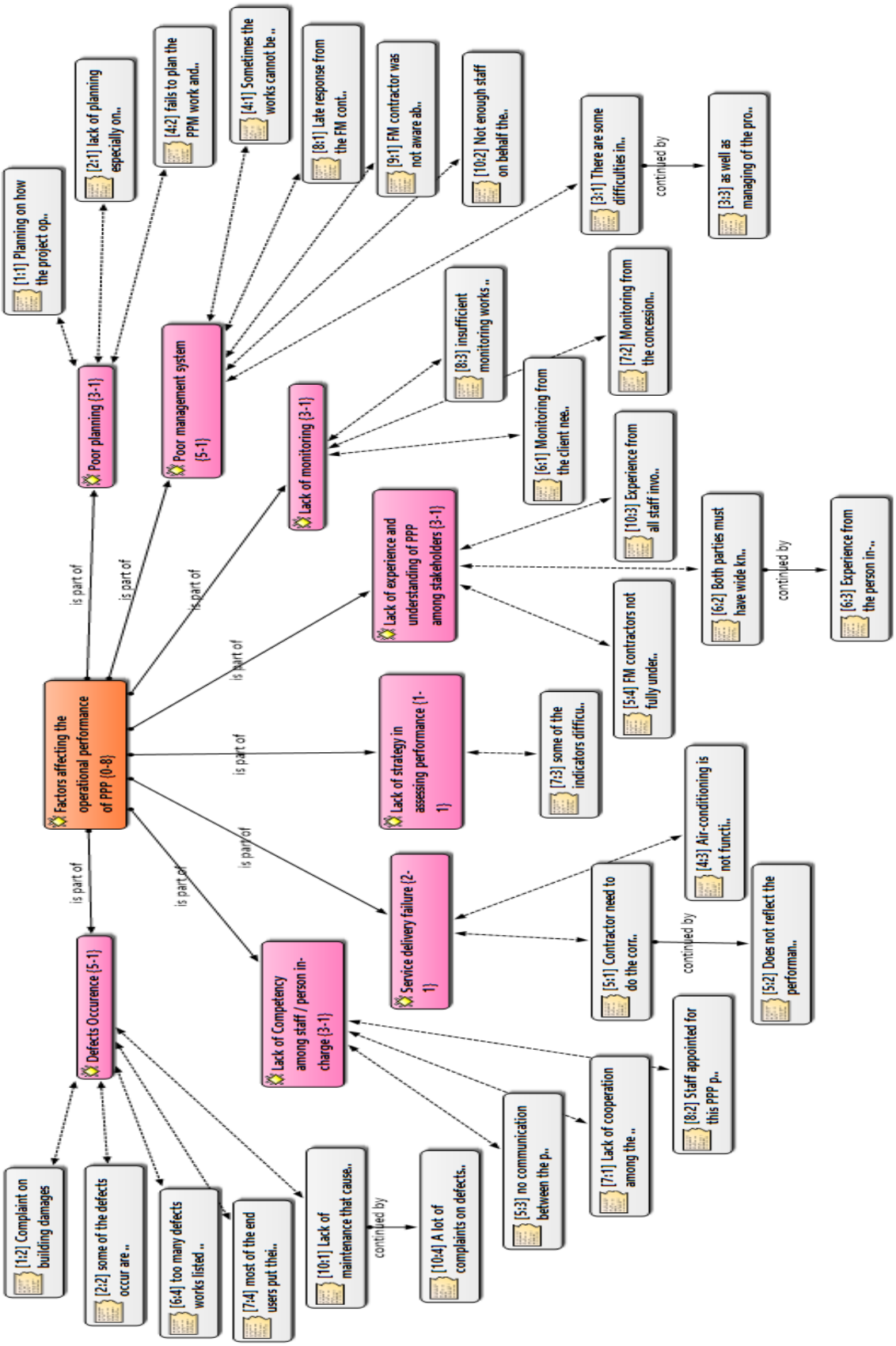

Figure 1: Factors Affecting the Operational Performance of PPP Projects

The fourth factor that affect the operational performance is *lack of strategy in assessing the performance of PPP projects.* This answer was provided by Participant 7 in Quotation 3 (P7:Q3). This participant revealed that some of the indicators are difficult to be measured and ultimately affect the performance of the PPP projects. It is supported by Yuan et al. (2008) and discovered that, when it involved a numerous and very complex KPIs in the PPP projects, it will cause the difficulties in implementing, monitoring and measuring the work's performance. In PPP project, KPIs is used as a tool in measuring the performance, however, lack of effective KPIs will cause conflict during the payment process. This was proved by Yuan (2008); Lop et al. (2017); and Ismail (2009) where lack of KPIs will affect the process of measuring the performance where it is difficult to determine whether the performance meets the agreed standards of provision (KPIs) or not.

The fifth factor identified is *lack of experience and understanding of PPP* among stakeholders. Stakeholders as mentioned by the participants are the involvement of both parties from public and private sectors namely, government agencies, end users, and facilities management contractors as concessionaire's representative. This statement was provided by the Participants 5 in Quotation 4 (P5:Q4). The coding was supported by other participants in their quotations (P6:Q2 continued with Quotation 3, P10:Q3). All the participants emphasised on the importance of knowledge and understanding of PPP concept among the stakeholders during the implementation of the projects. Based on the result, even though the responsibility of both parties in the PPP projects are different in term of maintaining and monitoring works, the participants (both parties) agreed that lack of experience on managing the work within PPP project will affect the whole implementation of the project.

Lack of monitoring during O&M phase is among other factors identified that would affect the performance of PPP projects. This coding was revealed by Participant 6 in Quotation 1 (P6:Q1) and supported by other participants with their quotations (P7:Q2, P8:Q3). Monitoring as revealed by the participants is concerning monitoring on facilities and services by both parties (public and private sectors). In fact, lack of monitoring is due to the insufficient manpower to carry out the services and maintenance works. This quotation was provided by Participant 8 in Quotaion 3 (P8:Q3). This is parallel with the study by Karim and Alkaf (2011) mentioned that failure of the concessionaire in maintaining the facilities was due to lack of monitoring by the concessionaire itself. In addition, international studies namely Cartlidge (2006) and Karim and Alkaf (2011) stressed on the importance of measuring and assessing the performance by the government. Thus, critical focus has been given on service planning, performance monitoring and contract management rather than on the direct management and delivery of services. The focus was to reduce the number of complaints on the failure of building function.

The next factor is on *poor management system*. This factor will affect the implementation of PPP project. This statement was discovered from Participants 4 in Quotation 1 (P4:Q1) and supported by other participants (P8:Q1, P9:Q1, P10:Q1, P3:Q1 continued with Quotation 3).

There are a lot of issues highlighted by the participants; for instance; delayed responses on the complaints issued by the end users, the FM contractors were not aware of their duties of maintaining the facilities and inadequacy staff on behalf of the client for monitoring the facilities works. Poor management from the participant's point of view are related to both parties that fails to manage the PPP projects successfully.

Finally, *poor planning* from public and private sectors in managing the PPP projects implementation. Poor planning by both parties can lead to the ineffective PPP projects implementation. This coding was revealed by the Participants 1 in Quotation 1 (P1:Q1) and supported by the other participants with their quotations (P2:Q1, P4:Q2). Both parties should know their roles and responsibilities when dealing with the PPP projects in order to achieve VFM.

5.0 Conclusion

This paper has presented the qualitative research concerning operational performance of PPP projects in Malaysia. From the findings, eight factors that affect the operational performance of PPP projects were identified namely; (1) defects occurrence, (2) lack of competency among staff or person in-charge, (3) service delivery failure, (4) lack of stratergy in assessing the performance, (5) lack of experience and understanding of PPP, (6) lack of monitoring, (7) poor management system and (8) poor planning. The discovery of these factors was revealed as the basic factors that need to be addressed in improving the performance and implementation of PPP projects in Malaysia. Therefore, serious action should be taken against these factors to ensure the implementation of the project is not disrupted thus affecting the project performance. This is crucial to both parties to take action for enhancing the performance of PPP projects in line with the PPP's key principle of payment based performance that involves long period of time. Hence, it is vital for the Malaysian Government to plan a way forward by proposing an effective strategy to improve the performance of PPP projects. For the future direction of this research, it will be concerned on the strategy how to improve and measure the performance of PPP projects in Malaysia with special focus on the O&M phase.

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