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Methodology for developing capability maturity levels for PPP stakeholder organisations using critical success factors

Abstract

Purpose- The success of any public-private partnership (PPP) project is largely dependent on the country's maturity on critical success factors (CSFs) that made PPP projects successful. Thus, the identification of metrics and standards for measuring the maturity of stakeholder organisations on CSFs for PPP projects implementation remain a challenge. Therefore, the purpose of this study is to use CSFs to develop a process maturity and determine the current maturity levels of stakeholder organisations in PPP projects implementation in Nigeria.

Design/methodology/approach- The study adopted literature review and six PPP project case studies including interviews in each case study and expert forum. The outcome of a comprehensive literature review provides a total list of fourteen CSFs that made PPP projects successful in Nigeria. These CSFs were employed for capability maturity levels definition ranging from level 1(Ad hoc) to level 5(Optimizing) in line with Capability Maturity Model (CMM) concept. Quantitative assessment was considered as a support tool for making an overall assessment of both the public and private organisations current capability maturity levels and for comparison approach.

Findings- A capability enhancement framework for stakeholder organisations in PPP project was developed. This framework was employed in assessing the current capability maturity levels of stakeholder organisations involved in PPP projects in Nigeria. Using this framework, it was found that public sector organisations were positioned between maturity level 1 and maturity level 2 (out of 5 maturity levels) on CSFs applicable to them. While most private sector organisations were placed in maturity level 2 on CSFs associated with them.

Practical implication: The results emanated from this study provided both the theoretical and practical implications. The theoretical implication provides new insights into the usefulness of CSFs in PPP projects and indicates that merely identifying possible CSFs for PPP projects are not sufficient. The practical implication shows that the framework developed in this study had provided the benchmark for the identification of methodical approach, and standard to process improvement in PPP infrastructure projects, which can be replicated in both the developed and developing countries. Thus, the framework could be used to benchmark future studies.

Originality/value- The framework would provide a useful guide and roadmaps for improvement by indicating 'what' needs to be done by stakeholder organisations involved in PPP projects in achieving higher capability maturity levels on identified CSFs for PPP projects in Nigeria and developing countries at large.

Keywords: Critical success factors, capability maturity model, PPP projects, organisations, stakeholders, Nigeria.

Paper type **Research paper**

Introduction

Governments in many countries ranging from mature economies to emerging market economies have found partnerships with the private sector as an attractive alternative to increasing and improve the supply of public infrastructure facilities. In line with global

trends, both the federal and state governments of Nigeria are ameliorating the key infrastructure challenges through the involvement of the private sector in infrastructure development via PPPs. This has led to over 51 infrastructure projects undertaken through PPPs between 1990 and 2009 (Vetiva, 2011). In 2013 and 2014, about 66 PPP infrastructure projects were in the pipeline (Infrastructure Concession Regulatory Commission, 2014). At present, the number of PPP infrastructure projects undertaken in Nigeria are of increase ranging from airport, seaports, roads, rails, power and energy, markets complex development, university hostel development, housing, commercial offices among others. Therefore, in a globalizing world there is a considerable interest in identifying critical success factors (CSFs) that made PPP projects successful (see Qiao *et al.*, 2001; Jefferies *et al.*, 2002; Zhang, 2005; Li *et al.*, 2005; Cheung *et al.*, 2012; Babatunde *et al.*, 2012; Dada and Oladokun, 2012; Famakin *et al.*, 2012; Babatunde *et al.*, 2015) among others.

Bullen and Rockart (1981) argued that the potential application and usefulness of the CSFs concept generated considerable interest in industry, as CSFs seemed to be an aid to management to strategize, plan, manage, monitor and achieve organisational goals. This is affirmed by many researchers. For instance, Ram and Corkindale (2014) asserted that the births of CSFs have introduced a new organisational approach for helping to achieve performance goals and competitiveness. The CSFs concept promised a systematic way of identifying the key areas that require the constant and careful attention of management to achieve performance goals. Fortune and White (2006) asserted that CSFs are the best-known approach for tackling the human and organisational aspects of projects. Niazi *et al.* (2003) argued that CSFs are used to establish a baseline to formulate a means for the maturity of the process. Yeo and Ren (2009) claimed that process maturity is mainly dependent on key capability areas extracted from CSFs. Ali and Kidd (2013) stated that the identification of CSFs help practitioners to work on areas responsible for the success of a process. Niazi *et al.* (2003) emphasised on the identification of CSFs is the measure to provide guidelines for improvements.

World Economic Forum (WEF) (2013) reported that the success of any PPP project is largely dependent on the country's maturity on each CSF that made PPP projects successful. Thus, approaches to using CSFs to develop PPP process maturity received scarce attention. For instance, there is a paucity of studies conducted to investigate the maturity of stakeholder organisations on CSFs for PPP projects, especially in Nigeria and developing countries at large. Few studies that investigated PPPs maturity (see Deloitte, 2007) failed to discuss the phenomenon from primary stakeholder organisations' perspectives. This study aims to fill this gap. It is in pursuance of this that primary stakeholder organisations in both the public and private sectors already involved in PPP projects implementation to include public sector authorities, concessionaires, local lenders/banks, consultants, and contractors are assessed to know their current capability maturity levels in respect to CSFs for PPP projects in Nigeria.

Capability maturity model (CMM) concept

Capability maturity concept has its origin in quality process improvements and traces back to Crosby (1979) studies in the late 1970's. Paulk *et al.* (1993) stated that Capability Maturity Model (CMM) was first developed in the software industry by the Carnegie Mellon University as a framework to inspect capability maturity of software providers. Fraser *et al.* (2002) affirmed that the modern day capability maturity concept gained its popularity based on the software CMM, initiated in the early 1990's in the USA. Eadie *et al.* (2011) asserted that since 1991, many CMMs have been developed and recognised internationally. The concept of CMM is increasingly applied in many disciplines. For example, software

- Organisations seeking to move from capability maturity level 1 to level 2 should establish a more disciplined process and a process group.
- Organisations advancing from level 2 to level 3 must have in place: (i) policies and plans that indicated the organisation will perform the process; and (ii) the organisation has been disciplined by establishing sound project management.

- Organisations moving from level 3 to level 4 must have demonstrated: (i) organisational standard process exists that associated with that process area; (ii) the processes in the organisation are more consistently defined and applied because they are based on organisational standard processes.
- Organisations seeking to move from level 4 to level 5 must have exhibited: (i) organisation focused on performance improvement of processes by using statistical and other quantitative techniques to improve organisational and project processes; (ii) organisation focused on understanding and controlling performance at the sub-process level and using the results to manage projects, and predictions are based in part, on a statistical analysis.
- Organisations in level 5 should be demonstrating: (i) continuous wide performance management and process improvement by using both qualitative and quantitative data to make decisions.

Some studies on CMM have been conducted in the construction industry. For instance, Sarshar *et al.* (2000) conducted research called Structured Process Improvement in Construction Enterprises (SPICE) to understand the applicability of the principles of CMM in the construction industry. The SPICE project aimed at improving processes on individual construction projects. Keraminiyage *et al.* (2006) presented a conceptual framework for the construction higher capability maturity level dynamics. Keraminiyage *et al.* (2007) identified higher capability maturity KPAs (key process areas) of construction organisations. Sun *et al.* (2009) conducted a study on a change management maturity model for construction projects. Eadie *et al.* (2011) identified the KPAs for an e-capability maturity model for construction organisations in the UK. Eadie *et al.* (2012) developed measures to capture capability maturity of ICT applications in the construction industry among others. Saleh and Alshawi (2005) asserted that there are some different models that can be used to establish the maturity of a system. Thus, the selected maturity models applied to project management in the construction industry are presented in Table 2 as follows:

It is evident from Table 2 that some maturity models are in existence and applied to project management in the construction industry with a view to improving productivity and attains quality gains. However, contributions of these maturity models to PPP project implementation are limited. Sarshar *et al.* (2000) advocated for a process improvement framework for the construction industry to meet the targets set by Sir Michael Latham in *constructing the team* (Latham, 1994). It is against this backdrop that necessitated this study aims at using CSFs to develop a capability enhancement framework for stakeholder organisations in PPP projects in Nigeria. Currently, no such framework exists in PPP projects, and this development is considered to be beneficial to the construction industry at large. Therefore, this framework would be useful in assessing the current capability maturity level of stakeholder organisations involved in PPP projects. It would further provide the roadmap for continuous improvement to guarantee the long-term success of PPP projects implementation in Nigeria and developing countries at large.

Research methodology

The methodology adopted for this study comprised a number of methods, namely, review of the literature, case studies (including semi-structured interview and review of documentary evidence within each case study), expert forum and validation (see Figure 2).

>>>>>>>>>>Insert Figure 2 <<<<<<<<<<<<<<<<<

In order to produce a plan that guides the process of collecting and analysing the data for this study, it is important, first to establish the philosophical underpinning on which the study stands. For instance, earlier researchers have emphasised a philosophical underpinning in the research process (see Collis and Hussey, 2003; Flick, 2006; Thurairajah *et al.*, 2006; Dainty, 2007; Badu *et al.*, 2012). Against this backdrop, the philosophical approach to case study design is based on post-positivist. This is supported by earlier researchers (see Eisenhardt, 1989; Flyvbjerg, 2011; Yin, 2012) that viewed the case study approach from a post-positivist viewpoint. Also, a number of earlier researchers supported case study research design. For instance, Amaratunga and Baldry (2001) asserted that case study research provides a holistic view of an event being studied. Fellows & Liu (2008) stated that case study allows an in-depth investigation of a research subject. Barkley (2004) argued that case study design is suitable for addressing “how” and “why” research question (s) within a study. Within the context of this study, a multiple case study approach was adopted to answer the research question:

RQ1. How can capability maturity levels of PPP stakeholder organisations be developed using CSFs?

Case study design can be in two forms: (i) a single case; and (ii) a multiple cases (Yin, 1994). Barkley (2004) argued that the choice of either single case or multiple case designs is greatly influenced by the nature of the research study. Yin (2003) claimed that using a single case study may not be relied on to draw conclusions about the population. Barkley (2004) argued that using a multiple case design allows generalisation of findings or replication within the cases. Yin (2009) affirmed that the results generated through multiple case studies are considered more compelling and robust. Thus, PPP infrastructure projects are unique, and it is unlikely to generalise the findings from a single project case study, particularly in developing countries where culture and stakeholders maturity are different. It is against this backdrop that multiple case studies were employed to investigate the research question and generate more reliable data, and to minimise misrepresentation. Amaratunga and Baldry (2001) argued that cases selections are unavoidably involved discretion and judgement. Creswell (2009) asserted that the researchers are purposively select cases and participants. Thus, the selection of the participants and cases does not necessarily involve a large number of participants and cases (Creswell, 2009). It is on this note that this study selected six PPP infrastructure project case studies in Lagos metropolis, Nigeria. The selected case studies were grouped into two sets. The first set comprised physical infrastructure/or civil and engineering PPP projects. This includes the concession of Lekki-Epe Expressway (road); the concession of Muritala Mohammed Airport (MMA2); and the concession of seaports. The second set encompassed social infrastructure PPP projects. This includes the development of university hostel accommodation (i.e. Emerald hostel at University of Lagos); Kanti towers modern office complex; and development of Tejuosho ultra-modern shopping complex within the study area. The summary of the selected six case studies is presented in Table 3.

>>>>>>>>>>Insert Table 3 <<<<<<<<<<<<<<<<<<

The rationales for choosing these PPP infrastructure project case studies are: (i) they are the first set of PPP infrastructure projects awarded by federal government and Lagos state government in Nigeria; (ii) the six selected case studies are in operation stage; (iii) it is apparent that the selected case studies are exhibiting appropriate characteristics of CSFs that made the case studies successful; and (iv) the stakeholder organisations involved in these case studies have the ability to determine their current capability maturity levels on each CSF and possibility for continuous improvement. Therefore, the selected PPP case studies are adjudged appropriate and suitable for developing a capability enhancement framework for stakeholder organisations in PPP infrastructure projects in Nigeria. This is similar to earlier studies on Capability Maturity Model (CMM). For instance, Sarshar *et al.* (2000) adopted two case studies when conducting a business process diagnostics tool for construction projects (i.e. SPICE). Cooke-Davies and Arzymanow (2003) adopted case study when exploring the maturity of project management in six different industries. Bay and Skitmore (2006) conducted six case studies when assessing the level of project management maturity in Indonesian companies. Rwelamila (2007) conducted one case study when exploring project management maturity in public sector infrastructure organisations in South Africa. Rwelamila and Phungula (2009) undertook one case study when assessing organisational project management maturity of the South African public institutions involved in public-private partnership (PPP) projects.

The target population for this study are key stakeholders/top management to include public sector authorities (i.e. ministries, department, and agencies), concessionaires, local lenders/banks, consultants, and contractors' organisations involved in the aforementioned six PPP project case studies. As earlier stated, the study adopted a number of methods for gathering the data (see Figure 2). For instance, a comprehensive literature review was conducted. The outcome of the literature review made a significant input into the identification of the specific CSFs for the successful PPP infrastructure projects in Nigeria. It also strengthened the basis of inquiry for the empirical data collection and analysis. This study therefore, adopted the CSFs for PPP projects identified by previous researchers through a rigorous primary data collection and analysis in Nigeria (see Babatunde *et al.*, 2012; Dada and Oladokun, 2012; and Babatunde *et al.*, 2015). These selected studies on CSFs in Nigeria have been published in reputable international journals and thus recognised by both academia and industry in Nigeria. Thus, the identified CSFs were filtered (i.e. to avoid duplication) to generate a total of 14 CSFs that made PPP projects successful in Nigeria. In this regard, the identified 14 CSFs are adjudged typical of any successful PPP project in Nigeria.

Therefore, the 14 identified CSFs were employed for capability maturity levels definition ranging from level 1(Ad hoc) to level 5(Optimizing) in accordance with Capability Maturity Model (CMM) concept, this led to the development of conceptual framework (see Figure 2). This approach is similar to earlier studies. For instance, Keraminiyage *et al.* (2006) adopted literature review to identify KPAs when exploring the dynamics of the CMM higher capability maturity level characteristics within the UK construction. Ram and Corkindale (2014) used already identified CSFs in the literature when examining the role of CSFs for enterprise resource planning (ERP) among others. In order to refine the conceptual framework, a five-man expert panel drawn from both public and private sector organisations was constituted, due their organisations notable involvement in PPP infrastructure projects in Nigeria. The criteria formulated by Chan *et al.* (2001) were modified to identify eligible experts for the panel as follows:

- Consequently, 5 experts were purposively selected after satisfying the criteria as mentioned earlier. This approach is supported by some earlier researchers. For instance, Marshall (1996) asserted that purposive sampling technique enables the researcher to select actively the most productive sample to answer the research question(s). Badu *et al.* (2012) argued that purposive sampling technique enables a researcher to select the study participants consciously. The category of stakeholder organisations selected for the expert forum is as follows:

- Expert 1: Local lender/Bank- First Bank of Nigeria Plc. (Head office)
- Expert 2: Public sector authorities- PPP office, Lagos
- Expert 3: Public sector authorities- Lagos State Development and Property Corporation
- Expert 4: Concessionaire- Lekki Concession Company, Lagos
- Expert 5: Consultant-Royal Haskoning DHV (Nigeria office).

The selected experts were consented to participate in the forum. Thus, the documents encompassed: cover letter; instructions; conceptual framework; capability maturity levels (1-5) characteristics; and editing document were sent through email to the 5-man expert panel. After one month, they all gave their feedback. Hence, the feedback was used to refine and improve the conceptual framework. Thereafter, the conceptual framework was taking to the aforementioned six PPP case studies for the purpose of verification of the capability maturity levels definition of the framework and to use the framework to determine the current capability maturity levels of stakeholder organisation on each CSF (see Figure 2). The semi-structured interviews were conducted to tap lived experience and interviewees were selected from the top management of different key stakeholders in both the public and private sectors in the aforementioned six PPP case studies (see Figure 2). Thus, face-to-face interviews were conducted with 36 key stakeholders comprised 18 interviewees from the public sector and 18 interviewees from the private sector in the six PPP case studies (see Table 3 for details). These key stakeholders in each case study comprised 3 from the public sector authorities (i.e. ministries, department and agencies) and 3 from the private sector to include: consultants, concessionaires, local lenders/banks, and contractors (see Table 3 for details). In ensuring the reliability and validity, both internal and external validations were conducted on the framework developed in this study (see Figure 2).

Results and discussion

Table 4 shows the background information of 36 interviewees from both the public and private sectors in the six PPP case studies (representing six interviewees in each case study). The interviewees were top management with their professional years of experience ranging from 8 to 28 years (see Table 4 for details) and had directly involved in PPP infrastructure projects from conception to completion.

>>>>>>>>>>Insert Table 4 <<<<<<<<<<<<<<<<<<

The verification and refinement of the framework were achieved through the use of framework for the semi-structured interviews coupled with personal observation, and review of documentary evidence in the six case studies. In order to use the framework to assess the

stakeholder organisations current capability maturity level on the identified 14 CSFs, a capability maturity level between 1-5, where 1 = ad hoc and 5= optimizing was provided in the framework. Consequently, within a particular capability maturity level (i.e.1-5), an identified factors characteristics were provided, which were used as the criteria for the rating of the interview questions with respect to each CSF. In this regard, a scale rating 1-5 was developed to rate the extent the stakeholder organisations have gone into a particular capability maturity level they belong. Therefore, the quantitative assessment was considered as a support tool for making an overall assessment of both the public and private organisations current capability maturity levels and for comparison approach. This is supported by previous researchers. For instance, Bay and Skitmore (2006) quantitatively assessed the level of project management maturity in Indonesian companies. Tembo and Rwelamila (2008) measured project management maturity in public sector organisation in Botswana. Cooke-Davies and Arzymanow (2003) quantitatively assessed the maturity of project management in six different industries. Rwelamila and Phungula (2009) adopted quantitative assessment when exploring organisational project management maturity of the South African public institutions involved in public-private partnership (PPP) projects among others. It is on this premise that the researcher was able to assess the current capability maturity levels of stakeholder organisations involved in PPP projects implementation. The results of average total scores for each of the assessed 14 identified CSF from both the public and private sectors in the six case studies are presented in Table 5 as follows:

Table 5 indicates the capability maturity levels of the stakeholder organisations involved in PPP infrastructure projects from both the public and private sectors on 14 CSFs assessed in this study. The findings reveal that 12 (out of 14) CSFs that assessed were applicable to the public sector organisations and their capability maturity levels ranging from 1.40 to 2.85, which is maturity level 1 (ad hoc) and maturity level 2 (repeatable). It can be deduced that the public sector organisations including ministries, departments, and agencies have low capability maturity levels between level 1 (ad hoc) and level 2 (repeatable) on these CSFs. For instance, the public sector organisations were in level 1 (ad hoc) on project technical feasibility, transparency in the procurement process, and appropriate risk allocation and risk sharing with their overall average scores of 1.40, 1.60, and 1.70 respectively. Thus, these scores were equivalent to 28%, 32%, and 34% respectively of the overall total score of 5 points assigned to the maximum point achievable. This finding is similar to previous studies. For instance, Rwelamila (2007) found that the public sector organisations involved in large infrastructure projects in South Africa were at the lowest level of maturity, which is level 1 (out of 5 maturity levels). Rwelamila and Phungula (2009) found that project management maturity of the South African public sector organisations involved in PPP projects were in maturity level 1 (out of 5 maturity levels) which is 'ad hoc'. Tembo and Rwelamila (2008) found an average maturity level of 2.3, which is maturity level 2 in all project management knowledge areas in public sector organisations responsible for infrastructure development in Botswana among others.

(2) The case studies assessment on suitability and applicability of the framework showed a consensus among the stakeholders that the framework is suitable for use and has practical relevance in PPP projects implementation particularly in Nigeria. Several of the stakeholder responses are as follows:

- A project consultant in case study 3 has this to say:
“The framework is first of its kind in implementing PPP projects in Nigeria. It offers a useful guide”.
- A stakeholder from Lagos State Development and Property Corporation (LSDPC) that involved in case study 5 said:
“The framework is logical, clear and very useful. But if it can be assessed electronically, it would facilitate the usage”.
- A stakeholder from Lagos State Public Private Partnership (PPP) Office that involved in case study 1 said:
“This is a thorough framework for measuring the maturity of different stakeholder organisations on critical success factors. The framework captured all critical success factors that always present in successful PPP projects in Nigeria. Moreover, the framework can be used as an assessment tool for prequalification of bidders in future PPP projects in Nigeria”.

(3) Based on these selected responses and other meaningful recommendations made by the selected stakeholders in the six case studies, it is evident that the framework is relevant and very useful in PPP projects implementation in Nigeria and the stakeholders are happy to use the framework.

To further prove the reliability and validity of the framework developed in this study, external validation was conducted (see Figure 2). This validation process involved the PPP experts in the public and private sector organisations, and academia. This is supported by earlier researchers. For instance, Liyanage and Egbu (2008) refined and validated the performance management framework (PMF) using the views of practitioners and academia, and the academia were mainly university lecturers and professors. Cheung (2009) validated a best practice framework for implementing PPPs in Hong Kong using nine respondents comprised PPP experts and academia among others. Therefore, the validation and evaluation of the framework was based on six assessment criteria identified by Yeung (2007), Cheung (2009), and Awodele (2012). The six assessment criteria include comprehensiveness; objectivity; practicality; replicability; reliability; and overall suitability of the framework for use in Nigeria. In this regard, the six aforementioned assessment criteria were used to develop a questionnaire survey for validation and evaluation of the framework. The questionnaire survey was based on a similar validation process undertaken by previous researchers. For instance, Yeung (2007) adopted questionnaire survey to validate the partnering performance index model. Cheung (2009) conducted questionnaire survey to validate the best practice framework for implementing PPP projects in Hong Kong. Awodele (2012) employed questionnaire survey to validate the framework for managing risk in the privately financed project in Nigeria among others. Thus, the following criteria were set-up to select the respondents for validation exercise:

- Having extensive working experience in PPP projects in Nigeria.
- Involving directly, recently, or currently in PPP projects in Nigeria.
- Having reached the managerial level in the public sector or managing director in the private sector or active researcher in academia.

<<<<<<<<<<<<<<<<<< Insert Table 6>>>>>>>>>>>>>>>>>>

<<<<<<<<<<<<<<<<< Insert Table 7 >>>>>>>>>>>>>>>>>>

Today, it is increasingly evident that a number of maturity models are in existence and applied to project management in the construction industry, most especially Capability Maturity Models (CMM) which has been documented being successfully used for process improvement in many disciplines. However, the applications of these maturity models to

process improvement in PPP infrastructure projects implementation received scarce attention. Thus, there is a need for a methodical approach and standard to process improvement in PPP projects. Against this backdrop, this study adopted the concept of CMM with respect to critical success factors (CSFs) to develop a capability enhancement framework for stakeholder organisations in PPP projects. The application of the framework in assessing the current capability maturity levels of primary stakeholder organisations involved in PPP infrastructure projects in Nigeria revealed that public sector organisations were between maturity level 1 and maturity level 2 (out of 5 maturity levels) on each CSF applicable to them. While private sector organisations were mostly in maturity level 2 on each CSF associated with them. It is established in this study that Nigeria's maturity is between maturity level 1 and maturity level 2 (out of 5 maturity levels) on CSFs that made PPP projects successful. These findings are similar to previous studies that found low maturity level, which is between level 1 and level 2 in all project management knowledge areas for public sector organisations involved in both large infrastructure projects development and in PPP infrastructure projects in South Africa and Botswana among others. This study is not without limitations. First, the identification of CSFs adopted to develop the framework based on a literature review, having other methods together such as questionnaire survey, which allows a rigorous statistical analysis may enrich the findings. Second, currently no such framework developed in this study exists for process improvement in PPP projects. Thus, the accuracy needs improvement in future work. Third, the framework is currently designed for stakeholder organisations in PPP projects, hence limiting the use of the framework to PPP projects only. Despite its limitations, the framework developed in this study would be a useful guide and providing roadmaps for improvement by indicating 'what' needs to be done in achieving higher capability maturity levels on each CSF applicable to both the public and private sector organisations in PPP projects in Nigeria. Also, the framework had provided the benchmark for the identification of methodical approach and standard to process improvement in PPP projects, which can be replicated in the developed and developing countries. Therefore, the framework is expected to enhance the success rate of PPP projects implementation, most especially in Nigeria and developing countries as a whole. The study findings would further enhance the conceptual and practical utility of the CSFs concept in the construction industry at large. Based on the findings of this study, the following policy recommendations are proposed:

- It is recommended that the public and private sector organisations in PPP projects, most especially in Nigeria and other developing countries are encouraged to apply the framework, as the framework provided feasible improvement roadmaps in achieving higher capability maturity levels.
- Since both the public and private sector organisations are in low capability maturity levels, it is therefore required of the stakeholder organisations in PPP projects implementation to undertake broad improvement programmes in achieving higher capability maturity levels. Consequently, once the improvement programmes are implemented; they need to be assessed to see whether they are effective.

It is evident that this study has not only made contributions to knowledge in relation to the use of CSFs to develop PPP process maturity framework for stakeholder organisations in PPP projects, but also contributes to the wider body of knowledge of process improvement in the construction industry. Therefore, further study should be conducted to widening the understanding of CSFs to develop PPP project process maturity in other countries, using a comparative approach.

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