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ANALYZING THE ISSUES OF E-TENDERING IMPLEMENTATION IN PUBLIC-PRIVATE PARTNERSHIP PRACTICE: A PRELIMINARY STUDY IN MALAYSIA

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Abstract

Public Private Partnership (PPP) has become a popular choice for policymakers in implementing important public projects, especially when it comes to the shortage of government funding resources and where it is necessary to counter public project inefficiency. However, the PPP tendering period, spanning from contract advertisement to contract award, tends to be lengthy due to reliance on paper-based tendering, with e-tendering not being fully utilized. Therefore, this study aims to enhance the understanding of issues related to e-tendering within the context of PPP practice in Malaysia. The research approach begins with a qualitative exploration through literature review and semi-structured interviews with five selected participants from various grades in the public sector, each possessing a minimum of three years of experience in PPP projects. The study identifies factors influencing e-tendering implementation, categorized into people, process, technology, and environment. It emphasizes the importance of IT literacy, consistent processes, suitable technology infrastructure, and organizational support. The readiness for e-tendering varies among participants, with some expressing optimism and others emphasizing the need for policy reinforcement. The outcomes of this study suggest the need for further exploration into the factors that PPP practitioners require before the implementation of an e-tendering system in PPP procurement processes.

Keywords: Public Private Partnership, e-tendering, preliminary study, thematic analysis

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INTRODUCTION

Public Private Partnership (PPP) is now an alternative procurement option for Governments worldwide, addressing infrastructure development and becoming a popular procurement approach (Das, Singh, & Jawed, 2022; Ruparathna & Hewage, 2015). A carefully designed and managed PPP contract is extremely effective in distributing the financial burden and operational risk of the project between the public and private sectors, enhancing the value for money, and reducing the development costs (Kalva, Brigis, Kruks, & Smits, 2022; Ramli, Adnan, Baharuddin, Bakhary, & Rashid, 2022; Tajul Ariffin, Mohd, Mustaffa, Bandi, & Mei Chee, 2019). The most critical stage in PPP procurement is the tendering stage as the PPP tendering procedure is more complicated and costlier compared to the traditional process in terms of the lengthy procurement period and lack of transparency during the tender process which is due to the manual process (Khaderi, Bakri, Abd Shukor, Mohamad Kamil, & Mahbub, 2019; Nordin, Ahnuar, Masrom, & Ali, 2023; Tolstolesova, Glukhikh, Yumanova, & Arzikulov, 2021).

With the widespread adoption of the internet, governments have seized the opportunity to modernize and offer traditional services directly online through digitalization. Hence, there's a compelling case for the digitalization of PPP tendering through the implementation of an electronic tendering (e-tendering) system. This transition is expected to enhance process efficiency, cost reduction, and overall accuracy while fostering heightened transparency (Issabayeva, Yesseniyazova, & Grega, 2019; Ratnawati, Setiawan, Taufik, & Mansoni, 2020). Notably, electronic tender awards are not yet common due to the relative novelty of e-tendering implementation in Malaysia (Ahmad, Abul Hassan, & Ismail, 2023; Soong, Ahmed, & Tan, 2020). Therefore, this study aims to comprehensively comprehend the issues linked to e-tendering within the context of PPP practices in Malaysia, specifically from the perspective of government personnel.

LITERATURE REVIEW

Public Private Partnership (PPP) Background

As PPPs have become an increasingly popular way to deliver public services and infrastructure projects, it is an increasingly popular choice for policymakers in implementing important public projects especially when it comes to the shortage of government funding resources and where it is necessary to counter public project inefficiency (Hashim, Sapri, & Ab Azis, 2019; Liu, Guo, Chen, & Martek, 2021; UKAS, 2023). PPPs have been practiced globally to achieve various objectives which include promoting infrastructure development, generating quality and funds, increasing construction and operational efficiencies, improving service delivery, reducing costs, and most importantly sharing risk

between the public and private sectors (Mohd Som, Omar, Ismail, & Alias, 2020). PPP involves the collaboration between public sector entities and private sector firms whereby a stand-alone business is created, funded, and managed by the private sector to develop an asset or provide services to the government and the public (UKAS, 2023a).

Officially, PPP in Malaysia was implemented in 2006 under the Ninth Malaysia Plan, and in the Tenth Malaysia Plan, 52 high-impact projects worth the sum of RM63 billion were to be executed via PPP (Musawa, Ismail, & Ahmad, 2017) and continue to be one of the construction procurement methods for public projects until now. A report by the World Bank (2022), stated that a total of 12 PPP projects in Malaysia reached financial closure with a total investment commitment of USD$4,739,000,000 (RM22.3billion). While a report from PPP Knowledge Lab (2021), stated that a total number of 126 PPP projects in Malaysia have reached financial closure since 1990 with a total investment of US$53,718 million (RM253.8billion). Currently, a total of 167 PPP projects are under construction/operation in Malaysia (UKAS, 2023b).

PPP offers several benefits that encourage collaboration with the private sector. Among these advantages, PPP is very effective for time-saving (O'shea, Palcic, & Reeves, 2019; Štěrbová, Halík, & Neumannová, 2020). If the projects are completed according to the contracted period, the consortium can start generating revenue by opening the facilities or services to the public. This will encourage the private sector to complete the project earlier. Financing the project through PPP also helps to accelerate project completion, and the private sector can profit after the project is completed (Tajul Ariffin et al., 2019). PPP is also a way how public sector can increase the effectiveness of infrastructure services and can be an engine of economic growth (Kalva et al., 2022).

Public-Private Partnership (PPP) Problems

PPP projects are delivered faster, and more cost-effectively compared to the traditional approaches generally focused on the construction period after the contract award. However, the tendering period between contract advertisement and contract award take longer time (Flannery et al., 2019). The most critical stage in PPP project procurement is the tendering stage with five problems identified during the tender stage which are complicated and costlier process; lengthy procurement period; lack of transparency; uncompleted projects; and open tender is not fully applied (Khaderi et al., 2019; Štěrbová et al., 2020). These problems in the tender process are due to the PPP procurement process that is usually carried out as paper-based tenders and manually (Bala & Dahiru, 2013; Cazalet & Zapatrina, 2021; UKAS, 2024).

Digitalization is a component of the wider modernization trend that has been occurring recently throughout the world. This trend toward digitalization

with digital technology and artificial intelligence (AI) is particularly noticeable concerning the development of e-procurement for traditional public procurement (Alashwal, Mohd-Rahim, Karim, & Loo, 2020; Tolstolesova et al., 2021; Zainon, Lun, Zaid, Myeda, & Aziz, 2019). Therefore, problems in the PPP tendering process can be solved by implementing an electronic tendering (e-tendering) system. This e-tendering can be used to replace the manual form of PPP procurement procedure as e-tendering is one of the IT techniques that construction industry experts have emphasized to help change the industry's culture towards greater efficiency, transparency and modernization (Kazaz, Inusah, & Ulubeyli, 2022) in improve procurement procedures and process.

E-tendering

Many studies have shown the benefit of e-tendering over manual traditional tendering processes (Aduwo et al., 2020; Fazekas & Blum, 2021; Ratnawati et al., 2020). During Tun Dr. Mahathir Mohamad's leadership as the Malaysian Prime Minister, the Multimedia Super Corridor (MSC) was established in 1996 under the Seventh Malaysia Plan as a project to enhance the ICT industry and introduce e-procurement as one of its flagship initiatives projects where transforming manual public procurement into electronic procurement (e-procurement) (Ahmad et al., 2023; Singh & Chan, 2022). The e-procurement system used in Malaysia by the Ministry of Finance Malaysia, known as ePerolehan was launched in September 1999 (MOF, 2016). However, e-tendering in the Malaysian construction industry has developed up to the second stage which involves two-way communication between clients and tenderers, excluding the award stage (Tan & Suhaida, 2016).

As there are also many challenges in implementing e-tendering (Al-Yahya, Skitmore, Cattell, & Bridge, 2018; N. Hashim et al., 2020; Kajendran, 2022; Maepa, Mpwanya, & Phume, 2023), Malaysian researchers also gaining interest in further research on e-tendering in Malaysian construction industry context (Ahmad et al., 2023; Deraman, Wang, Yap, Li, & Mohd-Rahim, 2019; Soong et al., 2020; Tan & Suhaida, 2016). Although the Malaysian Ministry of Finance has successfully implemented public e-procurement, but it is still unacceptable, and the system continues to be peculiar (Ahmad et al., 2023; Soong et al., 2020). Therefore, this study will focus on the implementation of e-tendering to improve the PPP procurement process.

RESEARCH METHODOLOGY

The rationale behind employing a preliminary study design was to delve deeply into the perspectives and issues of individuals involved in PPP projects and electronic tendering processes. This approach was chosen due to its aptness to explore practitioners' attitudes and expert opinions (Creswell, 2021). A

comprehensive literature review was conducted to establish the study area and existing information available on the topic. The review included articles published in several databases, including Scopus, Web of Science, and Google Scholar. The search article started in 2013 till 2023 using specified keywords such as e-tendering, electronic tendering, e-procurement, PPP, and tender process, with Boolean search commands of "and" and "or". The Mendeley and Microsoft Excel software were used for data extraction and analysis. Findings from the literature review also served as the input for semi-structured interview questions.

Following this, a qualitative method approach was applied involved conducting interviews with expert practitioners to explore the research area further and obtain a better understanding of current practices and phenomena in Malaysia. According to Piaw, (2022) a semi-structured interview is when the interviewer not only several formal questions that have been prepared before the session but is also given the freedom to question and explore the answers given by the participants in a more in-depth manner. The semi-structured interview was used as this approach allowed for flexibility in exploring participants' experiences, opinions, and suggestions regarding e-tendering in the context of PPP practice in Malaysia.

The semi-structured interviews were conducted using a purposive sampling technique to select participants from the public sector. Five participants who have at least three years of experience in PPP projects in Malaysia were chosen based on their expertise and experience in PPP projects in Malaysia, representing various grades within the public sector. The participants were selected to ensure a diverse range of perspectives and insights related to PPP procurement. Their backgrounds are presented in Table 1.

Potential participants were contacted to seek their interest and agreement to participate, and the objectives of the interview were explained by the researcher. The interviews were conducted face-to-face and took a duration of approximately 40-60 minutes per session. The interviews were audio-recorded to ensure accuracy in capturing participants' responses and facilitate subsequent data analysis. The interviews were conducted in English.

Table 1: Background of Participants

Respondent	I	II	III	IV	V
Role in PPP project procurement	Involved in project procurement for health and social sector	Coordinate with end user of the project implemented via PPP	Project manager to manage the PPP project procurement	Government officer who negotiates for the PPP projects	Evaluate PPP proposal papers and negotiate with the

Respondent	I	II	III	IV	V
					private sector
Able to define & describe PPP	Yes	Yes	Yes	Yes	Yes
Years Experience	3 years	8 years	5 years	4 years	10 years
Able to define & describe e-tendering	Yes	Yes	Yes	Yes	Yes
Believe e-tendering can change manual tendering process?	Yes	Yes	Yes	Not sure	Yes
Experience in using e-tendering	No	No	No	No	No
Ready to implement e-tendering	Yes	Yes	Not sure	No	Yes

The questions were designed to allow participants to provide their expert knowledge on the e-tendering process in PPP procurement practice including the practice of the PPP procurement process; the understanding of the e-tendering concept and issues of the implementation of e-tendering in the PPP process.

All the participants were assigned codes to protect their anonymity and the interviews were transcribed verbatim. A summary of the transcription was then emailed to the Participants to ensure its accuracy. This was done in such a way as to ensure the meaning was not compromised by being taken out of context. The data were manually analyzed to identify key themes and concepts that could be subsequently followed up.

All participants are knowledgeable in PPP and e-tendering, but only one is not sure that e-tendering can change manual tendering. None of them ever use e-tendering because of the unavailable system, however, three of them are ready to implement e-tendering in their work process.

FINDINGS AND DISCUSSION

The results derived from the content analysis, revealed several findings regarding e-tendering in PPP practice in Malaysia.

Public-Private Partnership as Best Procurement Practice

All of the Participants I, II, III, IV, and V are familiar with PPP because they are directly involved in PPP projects. They are involved in several PPP models such as build-operate-transfer, build-own-operate-transfer, build-own-operate, and built-lease-manage-transfer. All participants believe that PPP is the best project procurement method for public infrastructure projects compared to other project

procurement methods. Participants I stated that PPP offers a 'solution' to reduce burdens on governments by sharing significant project risks. Meanwhile, Participant II mentions that PPP complements the traditional procurement methods; however, depending on the model, the projects cover the whole life cycle of the project, which traditional procurement lacks.

According to Participant III, when comparing both methods, the traditional tender method is much easier because the process is straightforward. However, PPP is much easier to implement as it does not involve government money at the initial stage of implementation, and the project is completed according to the timeframe since the contractor will get paid after the project is completely built and handed over to the government. Even though the PPP tender process is more complex and takes longer, the project experiences fewer delays and is completed faster compared to traditional procurement, making PPP tenders more cost and time-saving. This opinion is similar to the discovery from (Štěrbová et al., 2020) in their study of comparing traditional procurement with PPP.

Meanwhile, Participant IV mentions that PPP helps reduce the fiscal burden of the government. Participant V also believes that PPP is the best method because the duration of a project is long and includes all necessary costs, especially maintenance costs. In PPP, the maintenance costs are already incorporated, while in other methods, the costs are separated and only the building cost is calculated. This finding suggests that PPP is widely recognized and valued for its potential to deliver successful infrastructure projects in Malaysia.

Public Private Partnership Tender Process

Based on their experiences, Participants I, II, and III agreed that the PPP project procurement tender takes longer to award compared to other project procurement practices, while Participants IV and V are unsure. Participant II experienced this prolonged duration due to the meticulous negotiations required in PPP projects, encompassing technical, financial, and legal aspects, while Respondent III highlighted the need for careful planning and detailed agreement formulation, which contributes to the extended timeline.

All participants agree that the current tender process for PPP project procurement is manual, requiring submission of hardcopy documents and evaluation. Participant I agree that the time and effort used for manual and online processes will differ and suggests optimization. Despite the manual process, Participant II's experience indicates that only the sale of tender documents is done electronically.

According to Participant III, the current practice necessitates comprehensive documentation of details and instructions to avoid future

complications which is in line with recommendation from Khaderi et al., (2019) that suggest standard guideline is necessary to guide path in ensuring all method are mange clearly. Nevertheless, there is a need to transition to digital methods, especially considering the challenges posed by remote work during the COVID-19 pandemic, which has made managing manual documents difficult and has consequently slowed down the workflow. Participant V believes that the current manual paper-based application process can be replaced with a digital process for a more effective workflow. However, based on Participant IV's experience, changing the manual process is difficult due to the involvement of negotiation processes by various PPP types.

E-Tendering Usage

On a personal level, the majority of participants believe that e-tendering can benefit PPP tenders through transparency, time savings, value for money, an automated system, and sped-up tender processes. Only one participant was personally unfamiliar with the concept of e-tendering. Both parties concur that e-tendering will change the PPP tendering work process because it can reduce human error and digitalize government services. Additionally, due to the lack of availability of such systems, all participants acknowledged their lack of experience with e-tendering for PPP projects and that they had not been exposed to handling such systems.

In addition, two participants claimed that there are no suitable e-tendering guidelines available, and two others expressed uncertainty about the existence of any such guidelines. However, one respondent pointed out the existence of e-procurement guidelines that might be used. Four participants also thought that by reducing human error and enabling the digitalization of government services, which can hasten the tender process, e-tendering has the potential to alter the PPP tendering work process. However, one respondent stated that before making comparisons, e-tendering must be implemented.

Factors to consider when implementing E-Tendering

The thematic analysis conducted on the views and comments from the Participants has resulted in 12 codes, which are further grouped into four main themes. These four themes are people, process, technology, and environment. Table 2 summarizes the process of thematic analysis.

The people-related factor is defined as the ability of employees to accept and adapt to the system (Goulding & Lou, 2013; Wang, Liu, & Parker, 2020). These include IT literacy, user understanding, slow response, cater to the user needs, staff competencies, competent people, and resistance to opt. Therefore, there is a need for staff to undergo hands-on training on the usage and function of the system. Besides that, to successfully implement e-tendering, the

staff should have the skill of IT literacy (Mehdipoor, Iordanova, Mehdipoorkalooraz, & Ghadim, 2023) and ICT competencies in handling systems (Kazaz et al., 2022) to ensure system functionality, as well as good comprehension and knowledge of PPP.

The process-related factors cover how an organization needs to implement IT successfully which is related to the ability of the organization to absorb and integrate the proposed systems into the current practice (Alyahya, Skitmore, Cattell, Nepal, & Bridge, 2018). These include consistent process, confidentiality of the process, consistent process, sensitive information misuse, transparency in the process, availability of guideline, right process, risks, process timeline compliance, and legal and policy issue. This shows that the policies and procedures should be strengthened before being integrated into the digital system as well as proper guidelines for the whole digitalization process. These policies and guidelines are important to ensure everyone consistently applies the conducted procurement process in the same direction.

The technology-related factor deals with the use of necessary infrastructure to allow an organization to use and monitor the e-tendering service (Maepa et al., 2023) which determines whether the organizations are prepared to adopt and implementation of e-tendering. These include IT infrastructure, big data needed, budget, costs occurred, security requirements, functional of system, troubleshooting system malfunction, security of the system, higher security needed, and confidentiality of data. Before implementing e-tendering, the financial support should provide suitable system infrastructure as well as physical equipment and software tools. Both physical equipment and tools will determine the functionality of the implemented system. On top of that, high system security is also required to protect the confidentiality of process and data to avoid the misuse of sensitive information besides promoting transparency of the tender process.

The environment is surrounding an employee where all of the work activities are carried out may bring positive or negative outcomes (Khan, Mahmood, & Shoaib, 2022). This factor has become the basis of decisional and financial support as organization behaviours and structures are often influenced by the demands of players on whom the organizations depend for resources and rules (Doherty et al., 2013). These include top management support, the ICT department needs to strengthen, plan, and guide people to the same direction, awareness, and current culture process. Both top management and the ICT department play an important role in implementing e-tendering. The top management determines the direction and future implementation of the system in the organization while the ICT department should ensure that the system will run smoothly, especially in terms of compliance with the timeline of a process.

Table 2: Thematic analysis of factors to implement e-tendering.

Factors	Code	Theme
IT literacy User understanding	Skill	People
Cater to user needs	Needs	
Staff competencies Competent people Resistance to opted	Staff	
Consistent process Confidentiality of process Sensitive information misuse	Practice	Process
Transparency in process Guideline not ready Risks factors Process timeline compliance	Procedure	
Legal issue Policies issue	Issue	
IT infrastructure Big data needed	Infrastructure	Technology
Budget Costs occur	Finance	
Security requirements Functional of system Troubleshooting system malfunction Higher security needed Confidentiality of data	Systems	
Top management support ICT department needs to strengthen	Leadership	Environment
Future plan Guide people in same direction Not aware	Management	
Current culture process	Culture	

E-tendering Readiness

When asked about their readiness for the practical utilization of e-tendering, Participants I, II, and V demonstrated readiness, given their belief in its potential to enhance efficiency. They highlight that a substantial number of government employees are enhancing their IT literacy and competencies, in line with the ongoing digitization of processes. However, Participant V holds a differing perspective and expresses unreadiness due to the belief that PPP policies and procedures need strengthening before implementing any e-tendering system. Similarly, Participant III expressed uncertainty, mentioning the need to

personally test the system and acquire the necessary equipment, knowledge, and a supportive community for effective e-tendering.

From Participant I's point of view, succession planning is a crucial tool to assess organizational readiness for e-tendering. The current situation is that when a project team member transitions to another department, monitoring the project becomes slightly more challenging, as the replacement officer must manually review the entire project tendering timeline and related events. Systematizing project information within an electronic system could simplify understanding the project's current status, indicators, and situation. This is due to the reliability of the data, allowing for immediate action to ensure project progress. In addition, surveys, interviews with those involved, testing of an e-tendering system prototype, having clear PPP tender policies, guidelines, and workflows for each model and type of project, as well as watching users interact with the system, can all be used to determine whether they are ready for e-tendering.

Participants I, II, and III feel that e-tendering has a chance to be successfully implemented phase by phase within Malaysian PPP contexts with the right support from everyone. The Internet of Things (IoT), 4IR, and digitization are the reasons for this. Respondents IV and V are unsure, though, as the Malaysian PPP market is predominately based on direct negotiation. Only recently, starting in 2018, have the majority of new PPP projects switched to RPF open/close tenders, the majority of which are still going through the tendering process. The current strategy should then be successful as it moves towards the tender.

These findings are in line with existing literature on PPP and project procurement. The recognition of PPP as the preferred method for public infrastructure projects align with previous studies (Das et al., 2022; Kalva et al., 2022; Musawa et al., 2017). Challenges associated with the lengthy tendering process and meticulous negotiations in PPP projects have been acknowledged in the literature (Flannery et al., 2019; Tajul Ariffin et al., 2019; Tolstolesova et al., 2021). This finding indicates that e-tendering is not currently fully implemented in the context of PPP projects in Malaysia, supporting the observations made by Bala & Dahiru, (2013) that PPP procurement processes are typically manually and paper-based (Cazalet & Zapatrina, 2021). However, the lack of e-tendering implementation and guidelines specifically for PPP projects in Malaysia requires further investigation and may offer fresh new insights for future research.

CONCLUSION

E-tendering has the potential to significantly improve the PPP procurement process by enhancing transparency, reducing costs, and increasing competition. However, to maximize the benefits of e-tendering, it is important to address the

challenges of accessibility, security, and integration. By doing so, organizations need to ensure and be ready to implement e-tendering to deliver high-quality public services and infrastructure projects. The outcome of this study proposes further study regarding the factors needed by PPP individuals before implementing the e-tendering system in the PPP procurement process.

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