E-Procurement Implementation Challenges During The COVID-19 Pandemic

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ABSTRACT

E-procurement, one of the Malaysian government's activities under its e-Government application, represents a more sustainable endeavour that uses the internet as the platform for its transactions. E-procurement was intended to improve the current manual procurement method used in government organisations. However, the support from industry, particularly the construction industry, remains far ahead. At the beginning of 2020, a new virus known as COVID-19 spread globally to affect communities worldwide. As of June 2021, more than 180 million instances of this virus variant had been identified. The pandemic caused by the COVID-19 virus has significantly impacted the construction sector, having prompted modest shifts in project timelines and corking approaches. Internet-based applications are being utilised and every stakeholder is being urged to adopt e-based methods. This research identifies the challenges faced by contractors using e-procurement applications during the COVID-19 pandemic. A questionnaire was distributed to contractors based in Kota Kinabalu, Sabah. This research will specifically help to explore e-procurement practices in Sabah.

***Keywords**: E-procurement, COVID-19 Construction, E-tendering*

INTRODUCTION

Coronavirus 2019 (COVID-19) has resulted in more than six million deaths worldwide (Aleem et al., 2022) and impacted communities all over the world. The epidemic has significantly impacted several industries, including the construction sector, resulting in the delayed completion of projects, especially those involving e-procurement. The situation forced most industry-related operations to be performed online and remotely. Only critical construction operations might be carried out as normal but at a minimum level to avoid spreading the virus (Liang & Jin Yee, 2020). Project procurement also had to be undertaken online, forcing all stakeholders to accept the alternative e-procurement method. Although e-procurement has been introduced in the construction industry, support from industry players remains very low (Norzaidi et al., 2013). Thus, the pandemic has been regarded as the factor driving the shift from traditional procurement towards e-based procurement. This paper aims to highlight the challenges encountered by contractors using e-procurement during the pandemic.

LITERATURE REVIEW
E-procurement in Malaysia

According to Ruparathna and Hewage (2015), procurement is defined as contract management, which is the main process in any construction project. Procurement involves multiple processes with major options and directions, including company demands, purchasing, transportation, warehousing,

inbound receiving processes, linking suppliers and buyers into the purchasing network, as well as rethinking the inter-organisational processes driven by transactions.

Electronic procurement (e-procurement) is the use of internet technology to acquire goods and services. It refers to the digitising and automating of various aspects of the procurement process. (Kushner, 2022). It entails applying different types of information technology (IT) to automate and simplify the procurement process, therefore increasing efficiency and transparency while lowering the operational costs within and between business partners (Bayazit, 2014). Gupta and Narain (2012) defined e-procurement as business-to-business (B2B) or business-to-consumer purchasing and sales of supplies and services through the internet, while it could include other information and networking systems such as electronic data interchange (EDI) and enterprise resource planning (ERP).

The construction industry is a vital element of Malaysia's economy. The government supports the construction sector through various initiatives due to the sector's contribution to and significant domino effects on other sectors of the economy and the Malaysian GDP overall (Jalil, 2022). The construction industry helps to improve the quality of life and living standards of the citizens of Malaysia (Tan & Kamarudin, 2016). According to Tan and Kamarudin (2016), all companies are starting to shift from conventional systems to newer and more effective operating practices with the advancements in information technology. In comparison to the traditional approach, the electronic process is believed to have the potential to generate greater wealth.

E-procurement in Malaysia was introduced by the Malaysian government to improve the quality of services (Nawi et al., 2017). According to Esa et al. (2013), the e-Perolehan application was introduced in Malaysia on 6th July 1999 by the Ministry of Finance (MOF) Malaysia. E-procurement was created to replace the traditional manual procurement system and is now a key activity within modern organisations. The new method uses the internet as its transaction platform (Esa et al., 2013). E-procurement has been applied in all sectors in Malaysia, including the private sector and government agencies, as it benefits many parties (Esa et al., 2013). According to Nawi et al. (2017), evidence indicates that the implementation of e-procurement in both the public and private sectors will lead to better decisions, reduced transaction costs, better-value procurement outputs, increased efficiency and less bureaucracy when dealing with the authorities.

Benefits of Implementing E-procurement

The benefits of implementing e-procurement can be divided into two: tangible and intangible. Tangible advantages can be accurately quantified, such as cost and time savings that result in better corporate performance and increased effectiveness, as well as sales increases arising from the access created for new customers or new business opportunities (Khu et al., 2012). Intangible benefits, which are not so easily quantifiable, include customer satisfaction, greater management of business processes and better contact with other firms which, for example, strengthens business relationships (Khu et al., 2012).

Panayiotou et al. (2004) analysed and calculated the cost reductions arising from implementing the e-procurement. According to Panayiotou et al. (2004), it is estimated cost savings of 1% and 20% per tender. The savings mentioned refer to the distribution costs of the physical documents (Khu et al., 2012). Ronchi et al. (2010) enhanced the cost-saving element of adopting e-procurement. According to Khu et al. (2012), their data indicated slight reductions in operating (7.6%) and order costs (11.2%), in addition to enormous savings on the expense of lead time orders and capital opportunity costs (88.9% and 72.0%, respectively).

Although Ronchi et al. (2010) were able to translate lead time into financial performance, such aspects were recorded as raw numbers by Panayiotou et al. (2004) in the tender process they examined (Khu et al., 2012). One study identified savings of 39.7% (2.7 months) on open tenders and 34.7% (4.1 months) on small tenders commissioned by the Greek General Secretariat of Commerce (Khu et al., 2012).

Although cost and time savings are frequently cited as advantages of using ICT systems in industry, qualitative or intangibles are essentially the key advantages of an ICT system, yet they are difficult to adequately define and quantify in definite terms (Khu et al., 2012). The intangible advantages that enhance the procurement process, as well as the operational advantages, are shown in Table 1 (Ronchi et al., 2010; Khu et al., 2012).

Table 1: Tangible Benefits of E-procurement (Ronchi et al., 2010; Khu et al., 2012)

Process Improvement	Organisational Benefits
• Easier Purchasing • Reduced paperwork • Reduced bureaucracy • Standardisation of process • Online Reporting • More visible and simpler process • Procurement regulations compliance • Reduction of mistakes • Easier access to information	• Opportunity for the decentralisation of procurement • Much spare time for sourcing experts to explore and negotiate • Wider range of suppliers • Enhanced contact and collaboration with suppliers

CHALLENGES IN IMPLEMENTING E-PROCUREMENT

Adopting an e-procurement system has greatly benefited the government. It has been highlighted as a method with which the government could reduce administrative costs and become more effective in their online procurement of products (Nawi et al., 2017). However, e-procurement involves certain disadvantages (Nkhata, 2014). According to Hamma-adama and Ahmad (2021), one barrier is the lack of knowledge among industry players and the government about the benefits of adopting e-procurement in maintaining fiscal responsibility. Isikdag (2011) also stated that a major obstacle to the successful adoption of e-procurement is a lack of understanding of its true benefits.

According to Ngunjiri (2019), the adoption of e-procurement is hampered by a lack of employee skills. Technology evolves rapidly, and individuals who adopt e-procurement must continue to upskill themselves with relevant training so they can keep up. Matunga et al. (2013) also mentioned that another obstacle to successful e-procurement adoption is the lack of e-procurement expertise or qualified employees. Market-related hurdles when implementing e-procurement include the concern about the number of consumers targeted in the online environment and the fear of pricing openness in e-procurement (Nkhata, 2014). In addition, adopting an e-procurement system might need more support from senior management (Ngunjiri, 2019). Higher management support is critical for a more effective deployment of e-procurement. Best practices for electronic media use, as well as e-procurement strategies and technologies, should be included in the firm's environment. According to Isikdag (2011), an important strategic hurdle when adopting e-procurement is the need for more understanding of the system.

Table 2: The possible challenges

Challenges	Brief explanation	References
Lack of awareness of e-procurement	Adequate and suitable information about the e-tendering process plays an important role to support business in the construction industry (Rahayu, Saleh & Prasetyo, 2013). In the construction industry at present, factors such as the lack of knowledge about and awareness of innovative information and communication technology (ICT) and web-based communication processes, systems and solutions still exist, although it can benefit the procurement, delivery, and life cycle of a project (NSW Government, 1998; Kajewski S. & Weippert A., 2000).	Rahayu, Saleh and Prasetyo (2013) NSW Government (1998) Kajewski and Weippert (2000)
Lack of knowledge	Lack of knowledge about the potential of e-procurement hinders the adoption of e-procurement.	Yevu & Darko (2021).
Lack of best practice and pilot projects	According to Nawi et al. (2016), new firms were struggling, in the absence of benchmarkable reference models, to adapt to the frameworks' functionalities and utilisation in their associations.	Nawi et al. (2016)
Lack of IT skills among staff	According to Mbeche et al. (2014), knowledge and workers' skills had an impact on adapting a new innovation. Another argument states that the lack of knowledgeable and skilled staff leads to delays in adopting e-procurement in most public institutions. According to Mugoro (2014), to ensure an organised and successful procurement system when conducting business, staff should be competent and trained to value the legal frameworks and networks.	Mbeche et al. (2014) Mugoro (2014)
Lack of top management support	According to Ngunjiri (2019), support from the top management is crucial in implementing e-procurement. The adaptation might be inhibited by a lack of both training and senior management support. Amaratunga and Baldry (2013) stated that the management should focus on staff training and the staff must prepare themselves with the skills required to operate the system to ensure that they are knowledgeable about the applications related to the procurement process.	Ngunjiri (2019) Amaratunga (2013)
Problems in management of servers	Lin and Hsieh (2000) stated that data management disturbances were usually caused by multiple entry points and inconsistent product coding. E-procurement requires a considerable amount of data input and trading between organisations and their suppliers. Thus, it is important for such staff to be able to engage in data management.	Lin and Hsieh (2000)
The fear of price transparency	One advantage of using e-procurement is that procurement information can easily be accessible from a web interface, thus enhancing the competitiveness and transparency, which results in optimised co-operative bidding (Sinkala, 2018). Most small suppliers lack the skills to handle an e-procurement platform, IT infrastructure and the capital needs to produce e-procurement. They worry that e-procurement will permit buyers to leverage price concessions (Singer, 2003).	Sinkala (2018) Singer (2003)

METHODOLOGY

The research methodology flow is divided into four (4) stages. The first stage contains the preliminary data gathering to identify research issues, the topic selection, the problem statement, and the research objectives. Brainstorming on the research topic was undertaken and current issues in e-procurement implementation in construction projects were identified. Stage 1 also involved an initial literature review to provide more information to use as a guideline and as references.

The second stage refers to the data collection. At this stage, the data collection technique was identified. The quantitative method was selected as the data collection technique and involved a questionnaire survey. An extensive literature review was undertaken to gain information on e-procurement implementation in the Malaysian construction industry, especially with regard to the G7 contractors. The study area for this research focuses on the Sabah construction industry and it involves both government and private projects. The respondents for this research were G7 contractors registered with Construction Industry Development Board (CIDB) in Sabah. G7 contractors have a tendering capacity of more than 10 million Ringgit Malaysia. This type of contractor was selected due to their capacity to adopt electronic-based management, including e-procurement systems, in their procurement processes in the construction industry.

All the information on e-procurement implementation was gathered from books, journal articles, international conference papers and materials available on the internet. At the third stage, data analysis, the data was analysed using descriptive data analysis. Tools like Microsoft Excel were used to assist the researchers in analysing all the data. The final stage presents the discussion on the results and findings obtained. From the discussion of these results, the conclusion and recommendations were generated.

Questionnaire and Sampling Method

The questionnaire consists of close-ended questions with multiple choice answers, as well as Likert-scale questions measuring the respondent's opinion about a statement. The questionnaire is divided into several sections: Section A contains closed-ended demographic questions, while Section B includes Likert-scale and closed-ended questions referring to the challenges of implementing e-procurement before and during the COVID-19 pandemic in contractor firms in Sabah.

The purposive sampling method offers the application of an intentional selection of informants, based on their specified characteristics corresponding to the research subject. Specifically for this research, the target group was contractors registered with the Construction Industry Development Board (CIDB) under G7 and those currently registered in Sabah, Malaysia. The total population for this specific group of people was464. The questionnaire was distributed randomly to contractors in Sabah and 142 responses were received.

RESULTS AND DISCUSSION

The sample size determines how a questionnaire is distributed to the target audience. The survey was distributed through Google Forms, e-mail and WhatsApp. All these methods were adopted as they were suitable approaches during the movement control order (MCO), which was introduced due to the COVID-19 pandemic and restricted people's movement. The questionnaire was distributed for a month, from April 1st to April 29th, 2021. The Cronbach's Alpha reliability analysis yielded a score of 0.780 for a total of 21 items. The recorded value indicates that data dependability was in the "good" category, above the allowed range. This range indicates that the data used for this study was reliable and could be utilised as a part of the conclusion (Shanmugam, Abiding & Tools, 2018). Furthermore, the greater reliability analysis results indicated that the respondents had no problems answering the questionnaire since most were familiar with the subject matter (Shanmugam et al., 2018).

Demographic Background

The respondents' profiles were examined as part of the data analysis (Refer to Table 3, Table 4 and Table 5). The goal of analysing the respondents' demographic profiles was to better comprehend and define their features, such as their level of education and work experience.

Table 3: Age of the Respondents

	Frequency	Percent
21-30	18	27.7
31-40	30	46.2
41-50	12	18.5
Above 50	5	7.7
	65	100.0

Table 4: Work Experience in Construction Industry

	Frequency	Percent
Less than 3 years	19	29.2
4-5 year	8	12.3
6-10 years	9	13.8
More than 10 years	29	44.6
	65	100.0

Table 5: Work Experience in E-procurement

	Frequency	Percent
Less than 3 years	26	40.0
4-5 year	6	9.2
6-10 years	14	21.5
More than 10 years	18	27.7
No experience at all	1	1.5
	65	100.0

Table 3 shows that the group aged 31-40 provided the most respondents, with a percentage of 46.2%. Table 4 shows that 44.6% of the respondents had more than 10 years of work experience in the construction industry, which equalled 29 out of 65 respondents. Table 5 shows that 40% of the respondents, which was equivalent to 26 individuals, had less than three years of work experience involving e-procurement.

Challenges in Implementing E-procurement Before and During the COVID-19 Pandemic

Table 6: Challenges in Implementing E-procurement Before and During the COVID-19 Pandemic in Contractor's Firm in Sabah

Challenges	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Lack of awareness of e-procurement	2	3.1	6	9.2	11	6.9	37	56.9	9	13.8
Lack of knowledge regarding national or global taxation	4	6.2	3	4.6	17	26.2	26	40.0	15	23.1
Lack of best practices and pilot projects	2	3.1	4	6.2	18	27.7	31	47.7	10	15.4
Lack of IT-skilled staff	3	4.6	13	20.0	10	15.4	33	50.8	6	9.2
Lack of top management support	4	6.2	9	13.8	15	23.1	30	46.2	7	10.6
Problems in the management of servers	3	4.6	10	15.4	15	23.1	28	43.1	9	13.8
The fear of price transparency	3	4.6	12	18.5	19	29.2	25	38.5	6	9.2

f =Frequency *%* = Percentage

Contractors were hesitant to use e-procurement because they needed to know the benefits of using electronic-based procurement systems. According to the survey findings, over half of the respondents acknowledged the problem, with 57% indicating "agree" and 14% indicating "strongly agree". According to Hamma-adama and Ahmad (2021), one of the barriers is the lack of knowledge among industry players and governments about the benefits of adopting e-procurement in maintaining fiscal responsibility. Isikdag (2011) also stated that one of the main obstacles to the successful adoption of e-procurement is the need for more understanding of its true benefits. The statement above proved that the lack of awareness about the benefits of using e-procurement would limit the contractors from exploring the provision of this approach.

The lack of IT-skilled staff challenged the contractors' credibility to provide better management with e-procurement. According to the results shown in Table 6, more than half of the respondents acknowledged the problem, with 51% indicating "agree" and 9% indicating "strongly agree". According to Kaliannan and Awang (2010), one of the primary concerns and obstacles inherent in Malaysia's e-procurement effort is low IT literacy among suppliers, which prevents the government and service providers from leveraging on the system's potential. They are either inadequately educated or less computer-savvy, and most transact through direct purchase or central contract modules. This statement proves that the lack of skilled IT staff limits contractors' ability to explore the provision of e-procurement.

Contractors could not execute e-procurement due to the lack of senior management support to shift to e-commerce. According to the survey findings, more than half of those polled confessed to having such problems, with 46% indicating "agree" and 11% indicating "strongly agree". The findings also reveal that 23% of respondents were unclear about the issue, while 20% disagreed with the assertion. One problem faced by local companies in adopting e-procurement, according to Nawi et al. (2016), is a lack of commitment from top management to supply the necessary IT infrastructure. This remark demonstrates that the lack of top management support also restricts the contractors' scope to investigate

the supply of e-procurement services.

The contractors' credibility to provide better management with e-procurement may be harmed by a lack of knowledge about nationwide taxation regimes linked to e-commerce. According to Table 6, more than half of the respondents acknowledged having this problem, with 40% stating "agree" and 23% stating "strongly agree". The findings also reveal that 26% of the respondents were unclear about the issue, while 11% disagreed with the assertion.

Managing servers can be challenging and may test a contractor's credibility to provide better management with e-procurement. Based on the results shown in Table 6, more than 50% of the respondents admitted to having this problem, whereby 43% stated "agree" while 14% stated "sstrongly agree". The results also show that 23% of the respondents were unsure about the problem, while 21% disagreed with the statement.

The fear of price transparency in e-procurement appeared to restrict the contractors from participating in e-procurement. The survey results show that 46% of the respondents admitted having the problem, whereby 37% of them stated "agree" and 9% stated "strongly agree". The results also show that 28% of the respondents were unsure of the problem, while 24% disagreed with the statement. According to Nawi et al. (2016), technology constraints on the suppliers' side include the lack of knowledge of and dedication to specialist software, as well as the start-up charge demanded by suppliers, which frequently exceeds the financial capacity of companies, or they may not want to commit to such a costly system. This statement proves that the fear of price transparency in e-procurement limits contractors from exploring the provision of e-procurement.

The lack of best practice studies and pilot projects challenged the contractors' credibility to provide better management with e-procurement. Based on the data in Table 6, more than 50% of the respondents admitted having the problem, whereby 48% of them stated "agree" and 15% stated "strongly agree". The results also show that 28% of the respondents were unsure of the problem, while 9% disagreed with the statement. In summary, in the context of this investigation and in comparison, with the existing findings, the current evidence indicates that procurement stakeholders, especially contractors, are struggling to implement e-procurement effectively.

CONCLUSION

The e-procurement application in the development sector is limited by various issues that restrict developers from providing adequate e-procurement management during development planning. The literature review highlights the issues frequently faced by developers, which can be categorised as management and privacy.

Management issues refers to the need for better best practices and pilot projects, which could lead to other barriers to the successful adoption of e-procurement. These include the need for more knowledge among industry players and the government about the benefits of adopting e-procurement in maintaining fiscal responsibility.

It is hoped that the outcomes from this paper will assist industry practitioners to recognise the use of e-procurement in development, whereby a basic understanding of the subject is required to prepare industry players for the transformation in construction strategies towards sustainable and green developments that are currently taking place for environmental protection purposes. This study only focuses on developers in the area of Kota Kinabalu, Sabah. Thus, it should be expanded to other areas, such as different major cities across the country, to further explore developers' opinions on the provision of e-procurement practices in other states so that more comprehensive results can be obtained to better understand e- procurement provision in Malaysia's major cities.

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