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(IJIREV)**[www.gaexcellence.com/ijirev](http://www.gaexcellence.com/ijirev)**SMALL CONTRACTORS' PERCEPTIONS OF THE  
BENEFITS AND CHALLENGES OF ONLINE TENDERING  
IN MALAYSIA**

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**Abstract:**

Digital procurement adoption has increasingly transformed construction tendering practices, yet most small contractors face challenges with this transformation. This study investigates the contractors' perception of the benefits and challenges of adopting online tendering in Malaysia. 250 sets of structured questionnaire surveys were distributed to Grade G1-G4 contractors registered with CIDB Malaysia. Of the 250 sets of questionnaires distributed, 99 valid responses were obtained (39.6% response rate). To evaluate respondents' perceptions of

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online tendering, descriptive statistical analysis was used. The findings indicate that small contractors generally have a positive perception towards online tendering, with the greater benefits being improved operational efficiency by reducing paperwork and printing costs, a quicker tendering process, as well as expedited access to the tender document. Despite these advantages, several implementation challenges remain. The most prominent barriers relate to a lack of support or training, cybersecurity concerns and inadequate IT competencies. In contrast, basic internet connectivity and platform usability seem to be the minor obstacles, suggesting that implementation challenges have shifted from technological access to organisational capability and operational support. Overall, small contractors generally have a positive view towards online tendering because they perceive its benefits as outweighing its challenges. The findings highlighted the need for enhancement of technical support, security of the system and reliability of online tendering platforms to support the success of the digital transformation of construction procurement in Malaysia.

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**Keywords:**

Construction Industry, Malaysia, Online Tendering, Small Contractors, Technology Readiness



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**Introduction**

The construction industry is moving from paper-based procurement to digital platforms. Online tendering in Malaysia has increased in recent years, particularly following the COVID-19 pandemic. This shift was driven by the need for more efficient, transparent and contactless procurement processes (Mehdipoor et al., 2023; Voon & Lee, 2025). Online tendering allows organisations to advertise, distribute, receive and evaluate tender documents through an online platform. Compared with conventional procurement methods, online tendering offers numerous benefits such as reduced paperwork, lower printing costs, faster procurement cycles, improved document management, enhanced transparency and wider access to tender opportunities (Affendy et al., 2022; Ashaari et al., 2018; Lin et al., 2024).

The successful adoption of online tendering depends largely on users' readiness and capability even though the benefits outweigh the challenges. In Malaysia, contractors registered with the Construction Industry Development Board (CIDB) under Grades G1 to G4 are generally recognised as small contractors. They constitute a significant segment of the construction industry and contribute substantially to delivering small and medium scale construction projects. Compared to G5-G7 contractors, small contractors often operate with limited financial

resources, technical expertise and digital capabilities, which results in challenges in transforming to digital procurement.

Previous studies have identified several barriers to implementing online tendering. These include poor information and technology (IT) knowledge, lack of digital skills, insufficient user training, online security considerations, system stability issues, internet connectivity problems and the financial costs of adopting digital procurement platforms (Ali et al., 2025; Aziz, 2024; Mehdipoor et al., 2023; Voon & Lee, 2025). Although these challenges are widely acknowledged, existing studies have primarily focused on online tendering adoption from a general or public-sector perspective. In contrast, few studies have examined how Malaysian small contractors perceive the benefits and challenges of online tendering. This is important because small contractors often face resource constraints while playing an important role in the construction industry.

Highlighting this gap is important because it shows the need for further research, as the successful implementation of online tendering depends not only on the availability of digital technologies but also on users' willingness and ability to adopt them. This study examines Malaysian small contractors' perceptions of online tendering by evaluating its perceived benefits and identifying the key challenges associated with its adoption. The findings provide insights to help policymakers, procurement platform providers and industry stakeholders develop strategies to strengthen digital readiness, improve user support and training, and encourage wider adoption of online tendering among small contractors in Malaysia.

## **Literature Review**

This section reviews the literature relevant to the adoption of online tendering systems among small contractors in Malaysia. It begins by examining the benefits of online tendering such as improvements in time savings, cost reduction, increased transparency, improved market access and improved document management. It then discusses the barriers of online tendering that hinder wider adoption across technical, organisational, economic, and regulatory dimensions.

### ***Benefits Gain from Online Tendering Systems***

Recent literature provides evidence of measurable efficiency gains associated with online tendering systems in the Malaysian construction industry. These benefits span time savings and process acceleration, cost reduction and resource optimisation, enhanced transparency and accountability, improved market access and competitiveness, and better document management, all of which are particularly relevant for resource-constrained G1–G4 contractors.

#### ***Time Savings and Process Acceleration***

One of the most consistently documented benefits of online tendering is a reduced tender cycle. According to Ndubuaku and Jerry (2023), online tendering can reduce tender life cycles by approximately 38 days compared with traditional paper-based processes. This can be achieved by eliminating physical document handling, streamlining communication channels and automating routine administrative tasks. Lin et al. (2024) add that online participation can minimise the consumption of time and reduce errors in the bidding process. This is because all documents are digitalised and submitted through an online platform without the need for

physical submission. This method indirectly opens opportunities for contractors from other states to participate. For small contractors, shorter tender cycles mean reduced costs and allow them to participate in multiple tenders simultaneously, as the submission is expected to reduce the evaluation period and contribute to faster project commencement (Lin et al., 2024; Mehdipoor et al., 2023).

### ***Cost Reduction and Resource Optimisation***

Online tendering contributes to cost optimisation if the tenderer has sufficient knowledge of it. Voon and Lee (2025) identify printing cost savings as a key benefit. The contractor gains financial optimization when the process of printing, copying and physical document storage is eliminated. Ndubuaku and Jerry (2023) quantify related savings such as reduced printing costs, copying costs and telephone charges between owners and contractors. All of this optimisation can cumulatively represent a meaningful amount to G1-G4 contractors who operate projects with tight margins (Hanisah et al., 2025).

Other than direct cost savings, online tendering has also improved resource utilisation by reducing transaction costs and increasing competition between tenderers (Lin et al., 2024). Not only that, but online tendering also eliminates arithmetical errors previously made manually by the human workforce. This can reduce the errors in manual calculation, reduce the risk of bid disqualification, reduce the use of paper, lower material costs as well as support environmental sustainability (Mehdipoor et al., 2023).

### ***Enhanced Transparency and Accountability***

Transparency is an important aspect of procurement efficiency and online tendering can help to improve it. Lin et al. (2024) note that online tendering improves contractual transparency, enhances stakeholder trust and reduces opportunities for corrupt practices. Ndubuaku and Jerry (2023) found that online tendering can reduce corruption activities and provide fairer opportunities for eligible contractors. This can particularly benefit small contractors, who may not have the informal connections that often give larger and more established firms an advantage in traditional procurement. Jiménez et al. (2022) provide a more cautious view, arguing that online tendering does not automatically reduce corruption. Its effectiveness depends on the strength of the governance and monitoring systems that support the procurement process. Therefore, while digitalization can improve transparency, it does not guarantee better procurement outcomes on its own. Mehdipoor et al. (2023) further note that online tendering increases document security through locked digital files that prevent unauthorised alteration. This also creates a digital audit trail that supports post-tender review and dispute resolution as well as giving small contractors greater confidence in the fairness of the process (Voon & Lee, 2025).

### ***Improved Market Access and Competitiveness***

Online tendering allows other contractors from different regions to participate in the tendering process easily without physical involvement. According to Lin et al. (2024), online tendering participation is geographically widened, which is particularly significant for G1-G4 contractors who are based in less urbanised areas. It supports those who are unable to be physically present due to geographical factors, allowing them to participate in multiple tenders at one time. Ndubuaku and Jerry (2023) add that online tendering centralises information, improves

accessibility and fosters competitiveness among contractors regardless of their location or company size. This reduces the information asymmetries that traditionally favoured certain parties in the industry.

### ***Document Management and Administrative Efficiency***

Voon and Lee (2025) highlight that improvement in document management is another benefit of online tendering. Electronic document storage makes it easier to retrieve documents, conduct audits and verify compliance with tender requirements. This can be particularly useful for small contractors that have limited administrative staff. Similarly, Mehdipoor et al. (2023) found that standardized digital documents can reduce confusion and errors during the tendering process. As a result, contractors can spend more time focusing on the quality of their bids rather than administrative requirements.

### **Barriers to Online Tendering Adoption**

Despite the benefits, G1–G4 contractors in Malaysia still face several challenges in adopting online tendering. These challenges, as identified in the literature, include technical problems, limited infrastructure, lack of organisational readiness, high costs, legal issues, system design problems, and administrative difficulties.

#### ***Technical and Software-Related Challenges***

A technical difficulty associated with online tendering is the functionality and reliability of the software. Voon and Lee (2025) stated that limitations of the software and problems relating to online security are the main challenges. Software that is not reliable may suffer from downtime, lose data and make errors when processing data. These problems can reduce the confidence of contractors, in particular those who have a small IT support team. Inusah et al. (2025) likewise recognised that a shortage of both technical and human resources causes the major difficulties that a company encounters when adopting an online tendering system.

Cybersecurity is also a major issue. Voon and Lee (2025) as well as Mehdipoor et al. (2023) expressed concerns regarding data security, confidentiality, and unauthorised access to tender information. Inusah et al. (2025) went on to state that centralised online tendering databases could be susceptible to cyberattacks and data breaches. Gong et al. (2023) discovered that data tampering can result in financial losses and provide unfair advantages to some parties. These problems could therefore have a negative effect on the transparency and fairness of online tendering.

#### ***Infrastructure and the Digital Divide***

Poor ICT and internet infrastructure is a major challenge faced by small contractors, especially those in less urban areas (Inusah et al., 2025). Hamsyah (2023) notes that limited facilities and infrastructure block implementation and that the digital divide can prevent small and minority-owned businesses from taking part equally. This issue is not unique to Malaysia. Mpehle and Mudogwa (2020) also found that uneven ICT infrastructure slowed the launch of a digital supplier database in South Africa's Limpopo provincial government. The problem goes beyond just physical infrastructure. Hamsyah (2023) points out that both providers and officials often lack IT skills, which is notable as another barrier. For G1–G4 contractors, this gap is especially

hard to bridge because they have limited budgets for IT staff or outside consultants (Inusah et al., 2025).

### ***Organisational Readiness and Human Factors***

Organisational readiness is important for the successful adoption of online tendering. It includes employees' attitudes, IT knowledge, available software and investment in technology. Lin et al. (2024) found that both human and technical readiness are important for successful implementation. However, these basic capabilities are still lacking in many small contractor companies (Hanisah et al., 2025).

Resistance to change is another challenge. According to Mehdipoor et al. (2023), 75% of respondents considered resistance from management and staff to be a significant barrier. Hamsyah (2023) explained that this resistance can come from organisational, group and individual factors. For small contractors, this problem can be more difficult to address because their organisational structures are often informal and decision-making is usually controlled by the owner or manager. Therefore, overcoming resistance to change requires continuous engagement and proper change management (Hamsyah, 2023; Mehdipoor et al., 2023). Another important barrier is lack of IT knowledge and awareness. Mehdipoor et al. (2023) identified a lack of IT knowledge as the highest-ranked challenge reported by 83% of respondents. In the same study, 75% of respondents also identified a lack of awareness among tenderers as a challenge. Ndubuaku and Jerry (2023) found that employees may feel worried or avoid responsibility when new processes are introduced. Fear of making mistakes and low confidence can also discourage the adoption of online tendering. These challenges can be more difficult for small contractors to manage because they usually have a limited number of employees.

### ***Economic and Cost Barriers***

High initial and implementation costs are a major economic barrier for small contractors with limited financial resources. Musarat et al. (2024) identified the high upfront cost of implementing new technologies, standards, and specifications as a major challenge in digital implementation. Similarly, Inusah et al. (2025) identified high investment costs as a common barrier across different countries. Nchabeleng and Ncube (2025) also found that budget constraints slowed the implementation of e-procurement in a South African provincial treasury. For G1–G4 contractors, the costs of adopting online tendering can be difficult to manage. They may need to spend money on hardware, software licenses, training and system integration. This can be a major burden for contractors operating with limited capital and small profit margins (Inusah et al., 2025; Musarat et al., 2024). Hamsyah (2023) also identified the payment structure for development costs as an additional challenge. Although online tendering may provide cost savings in the long term, the immediate costs and cash-flow impact of implementation may still discourage contractors from adopting it.

### ***Legal, Regulatory, and Policy Gaps***

Poor policy frameworks and legal mechanisms form an institutional obstacle to adoption. Inusah and others (2025) point out that inconsistent policy standards and inadequate legal frameworks are constant barriers in different situations, and Mehdipoor and colleagues (2023) found that 63% of the respondents mentioned legal problems, indicating concerns regarding

the legal validity of electronic documents and digital signatures. Hamsyah (2023) also observes that the technical difficulties relating to privacy, security, and standardisation call for legal frameworks and system-management skills which are generally not available, thereby leaving small contractors—who usually do not have their own legal expertise—vulnerable to uncertainty and legal risk (Inusah et al., 2025).

### ***Service-Provider and System-Design Issues***

The fact that the design of online tendering systems does not meet the requirements of small contractors is a significant yet frequently neglected obstacle. Aziz (2024) points out that there is poor alignment between vendors and service providers, the result of platforms generally being designed for large-scale procurement rather than taking into account the needs of small contractors, and this highlights the need for greater involvement of service providers and for more customised solutions. Anestri et al. (2025) give a critical evaluation of e-catalogue systems used in the procurement of construction services, concluding that the current way these systems are implemented fails to achieve true efficiency because of inadequate socialisation, biased regulation, incomplete product listings, ineffective price negotiation, a high level of workload, and databases that are not well integrated and are out of date, thus stressing the importance of ongoing improvement and of designing the online tendering platforms with the user in mind.

### ***Administrative and Operational Challenges***

The effectiveness of an online tendering system also depends on the operational problems even if the system works properly. Arman et al. (2023) found that some local contractors in Padang, Indonesia, faced repeated problems when preparing their tender documents. These included incomplete tax documents, cooperation agreements, technical work analyses and missing work-experience references. These problems show that contractors may need more support in preparing their bids and meeting tender requirements.

Other than the above-mentioned problems, clients can also create challenges for online tendering. Mehdipoor et al. (2023) found that 79% of respondents identified clients' uncertainty about implementing the innovation as a major challenge. When clients continue to use paper-based procurement methods, contractors may have less motivation to invest in digital skills and technology.

The challenges faced by G1–G4 contractors are interconnected. Technical problems such as system reliability, data security and infrastructure can occur together with organisational problems, including limited IT knowledge, resistance to change and low awareness. Financial issues such as high initial costs and limited capital can make these challenges even more difficult to overcome (Hamsyah, 2023; Inusah et al., 2025; Mehdipoor et al., 2023; Musarat et al., 2024; Voon & Lee, 2025). Institutional gaps and problems with service providers can also add to these difficulties (Anestri et al., 2025; Aziz, 2024; Inusah et al., 2025). Therefore, addressing these challenges requires cooperation from different stakeholders. Any solution should also consider the specific limitations and needs of small contractors.

## Methodology

This study adopts a quantitative research approach to examine small contractors' perceptions of online tendering adoption, centring on its benefits and implementation challenges. This study selected a questionnaire survey as the primary data collection method. It is because this method allows the systematic collection of respondents' perceptions from a relatively large number of respondents and this method is widely used in construction management research (Hayden et al., 2023; Hilmi et al., 2019; Nakamya et al., 2025). The target population consisted of CIDB-registered small contractors in Malaysia, specifically contractors classified under Grades G1 to G4. The researchers selected these contractor grades because they represent small contracting firms that may face greater restrictions in financial capacity, technical resources and digital readiness than larger contractors. They obtained the sampling frame from the CIDB contractor directory and distributed the questionnaires electronically through Google Forms. They distributed 250 sets of questionnaires and received 99 valid responses, yielding a response rate of 39.6%.

The questionnaire was developed based on dominant themes identified from previous studies on online tendering adoption and digital procurement implementation. The instrument consisted of four main sections, namely: (i) respondent demographic information, (ii) company digital readiness and access, (iii) perceived benefits of online tendering, and (iv) perceived challenges associated with its adoption. The perception-related items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The collected data were analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistical analysis, including mean scores and ranking was used to determine the relative importance of the identified benefits and challenges of online tendering. In addition, Cronbach's alpha reliability analysis was conducted to evaluate the internal consistency of the measurement items.

## Result and Discussion

The researchers distributed the questionnaire to 250 CIDB-registered contractors of Grades G1 to G4 and received 99 valid responses, giving a response rate of 39.6%, consistent with benchmarks reported in the literature (Cook et al., 2000; Watt et al., 2002; Wu et al., 2022). Data were analysed descriptively using frequency, percentage and mean scores.

### *Reliability Analysis*

Prior to analysing the survey results, the internal consistency of the two multi-item scales was assessed using Cronbach's alpha. As shown in Table 1, the benefit scale (7 items) and the challenge scale (10 items) both recorded reliability coefficients above the commonly accepted threshold of 0.70, confirming that the items within each scale are measuring their intended construct consistently.

**Table 1: Reliability Analysis of the Measurement Scales**

| Construct                                | Number of items | Cronbach's alpha | Reliability level |
|------------------------------------------|-----------------|------------------|-------------------|
| Perceived benefits of online tendering   | 7               | 0.852            | Good              |
| Perceived challenges of online tendering | 10              | 0.915            | Excellent         |

Source: (Author, 2026)

### *Demographic Background*

**Table 2: Demographic Background of Respondents**

| Variable                | Category                    | n  | %  |
|-------------------------|-----------------------------|----|----|
| Contractor grade (CIDB) | G1                          | 18 | 18 |
|                         | G2                          | 25 | 25 |
|                         | G3                          | 34 | 35 |
|                         | G4                          | 22 | 22 |
| Type of company         | Private Limited (Sdn. Bhd.) | 43 | 44 |
|                         | Sole proprietorship         | 36 | 36 |
|                         | Partnership                 | 20 | 20 |
| Years of operation      | Less than 3 years           | 26 | 26 |
|                         | 3 to 5 years                | 25 | 25 |
|                         | 6 to 10 years               | 27 | 28 |
|                         | More than 10 years          | 21 | 21 |
| Number of employees     | 1-5                         | 17 | 17 |
|                         | 6-10                        | 35 | 36 |
|                         | 11-20                       | 32 | 32 |
|                         | More than 20                | 15 | 15 |
| Main project category   | Building works              | 49 | 50 |
|                         | Civil engineering works     | 20 | 20 |
|                         | Electrical works            | 15 | 15 |
|                         | Mechanical works            | 12 | 12 |
|                         | Others                      | 3  | 3  |

Source: (Author, 2026)

Table 2 shows that respondents are dominantly from Grades G2 and G3 (60% combined) which is mostly operated as Private Limited companies (44%). They have been in operation for a fairly even spread of durations with the largest group (28%) having operated for 6 to 10 years. Most respondents employ between 6 and 20 workers (68% combined). Building works is the dominant project category (50%) and followed by civil engineering works (20%). This profile confirms that the sample represents small, CIDB-registered contracting firms across a range of company sizes and specialisations.

## *Preparedness for Online Tendering Implementation*

**Table 3: Respondents Preparedness in Adopting Online Tendering**

| Company preparedness in adopting online tendering |                     | N  | %  |
|---------------------------------------------------|---------------------|----|----|
| Reliable internet access                          | Reliable            | 73 | 74 |
|                                                   | Moderately reliable | 23 | 23 |
|                                                   | unreliable          | 3  | 3  |
| Main device used                                  | Laptop/computer     | 92 | 93 |
|                                                   | Tablet              | 4  | 4  |
|                                                   | Smartphone          | 3  | 3  |
| IT literacy                                       | Moderate            | 68 | 69 |
|                                                   | High                | 23 | 23 |
|                                                   | Low                 | 8  | 8  |
| Training received                                 | No                  | 50 | 51 |
|                                                   | Yes                 | 49 | 49 |
| Frequency of participation                        | Occasionally        | 45 | 46 |
|                                                   | Often               | 23 | 23 |
|                                                   | Rarely              | 17 | 17 |
|                                                   | Never               | 9  | 9  |
|                                                   | Very often          | 5  | 5  |

Source: (Author, 2026)

Table 3 shows that internet access is largely reliable (74% reliable, 23% moderately reliable) and tendering is conducted almost exclusively via laptop or computer (93%). IT literacy is mostly moderate to high (92% combined) yet only 49% of respondents have received training on the online tendering system. Most respondents participate in online tenders only occasionally (46%). This profile is consistent with the organisational readiness gap identified in the literature where most of the respondents appear digitally capable in principle. Yet, formal training remains the exception rather than the norm, echoing Hanisah et al.'s (2025) observation that many small contractors lack the foundational capabilities needed for confident adoption.

## *Perceived Benefits of Online Tendering*

Table 4 summarises the respondents' ratings of the perceived benefits of online tendering. The items were analysed using mean scores and ranked according to the level of agreement.

**Table 4: Perceived Benefits of Online Tendering**

| Benefit item                                   | Mean | SD   | Rank |
|------------------------------------------------|------|------|------|
| Reduces paperwork and printing costs           | 4.28 | 0.85 | 1    |
| Speeds up the overall tendering process        | 4.10 | 0.69 | 2    |
| Reduces time needed to obtain tender documents | 4.07 | 0.79 | 3    |
| Improves access to more tender opportunities   | 3.99 | 0.81 | 4    |
| Provides clear submission instructions         | 3.94 | 0.81 | 5    |
| Makes procurement more transparent             | 3.85 | 0.86 | 6    |

|                                                    |      |      |   |
|----------------------------------------------------|------|------|---|
| Enables faster communication with clients/agencies | 3.85 | 0.83 | 6 |
|----------------------------------------------------|------|------|---|

Source: (Author, 2026)

Table 4 indicates that all seven benefits have mean values above the midpoint scale of 3.0. These scores indicate that respondents' views on online tendering are favourable overall. Reducing paperwork and printing costs was ranked first with a mean score of 4.28. Respondents have a view that online tendering can speed up the overall tendering process, with a mean score of 4.10, and this benefit was ranked second. The third rank was reducing document turnaround time, with a mean score of 4.07. This finding aligns with earlier studies demonstrating the operational advantages of online tendering. For example, Ndubuaku and Jerry (2023) reported a 38-day reduction in tender cycle duration, while Voon and Lee (2025) identified lower paper and printing costs as a significant benefit.

Respondents also agreed that online tendering contributes to improved access to more tender opportunities, with a mean of 3.99, followed by providing clear submission instructions, with a mean of 3.94. These findings indicate that, other than improving efficiency, respondents recognise online tendering as a platform that facilitates wider access to procurement opportunities while promoting a more structured and standardised tender submission process. Meanwhile, the benefit items such as procurement transparency and faster communication with clients or agencies both recorded a mean of 3.85 which is slightly lower than the other benefit items. However, respondents still generally agreed with these perceived benefits. The comparatively lower ratings suggest that respondents may perceive the operational advantages of online tendering more readily than its governance-related benefits. This finding aligns with Jiménez et al. (2022), who argued that improvements in transparency through online procurement depend on effective implementation and organisational practices rather than being an automatic outcome of digitalisation.

### *Perceived Challenges of Online Tendering Adoption*

Despite the positive perceptions regarding the benefits of online tendering, respondents acknowledged that its successful implementation is not without challenges. Understanding these perceived challenges is essential, as they may influence the willingness and readiness of organisations to adopt online tendering practices. Accordingly, respondents were asked to evaluate the challenges they perceived in adopting online tendering. Table 5 below presents the perceived challenges, along with their respective mean scores and rankings.

**Table 5: Perceived Challenges of Online Tendering Adoption**

| Challenge item                                     | Mean | SD   | Rank |
|----------------------------------------------------|------|------|------|
| Lack of support or training                        | 3.91 | 0.86 | 1    |
| Data security and confidentiality concerns         | 3.89 | 1.06 | 2    |
| Lack of IT skills                                  | 3.85 | 0.97 | 3    |
| Frequent technical problems or downtime            | 3.78 | 0.85 | 4    |
| Continued dependence on manual/hard-copy documents | 3.76 | 0.87 | 5    |
| Difficulty uploading documents (size/format)       | 3.64 | 0.98 | 6    |
| Burdensome portal subscription cost                | 3.53 | 0.93 | 7    |

|                                                      |      |      |    |
|------------------------------------------------------|------|------|----|
| Costly digital certificate/registration requirements | 3.36 | 0.95 | 8  |
| Internet connectivity difficulties                   | 3.25 | 1.11 | 9  |
| Platform is complicated to use                       | 3.17 | 1.07 | 10 |

Source: (Author, 2026)

Table 5 shows that the main challenges are related to contractors' ability to implement online tendering rather than the usefulness of the system. Lack of support or training was the main challenge with a mean score of 3.91. This was followed by data security concerns (3.89), lack of IT skills (3.85), and system reliability issues (3.78). These findings show that respondents generally accept online tendering but still face difficulties in using and implementing it effectively.

The findings are consistent with previous studies. Mehdipoor et al. (2023) also identified a lack of IT knowledge as a major barrier to implementation. Similarly, concerns about security of their data and the reliability of the system were also reported by Voon and Lee (2025), Inusah et al. (2025) and Gong et al. (2023). This shows the importance of providing better technical support and improving users' IT skills.

Other operational and financial issues were also seen as challenges. Frequent technical problems or system downtime recorded a mean score of 3.78, while continued reliance on manual or hardcopy documents recorded a mean of 3.76. Difficulty uploading documents because of file size or format restrictions (3.64) and portal subscription costs (3.53) were also considered important challenges.

In contrast, internet connectivity (3.25) and platform usability (3.17) were the least significant challenges. This shows that access to the internet and the basic use of online tendering platforms are no longer major problems for Malaysian G1–G4 contractors. Instead, they are more concerned about training, technical support, IT skills and data security. This finding differs from earlier studies by Hamsyah (2023) and Mpehle and Mudogwa (2020), which identified inadequate digital infrastructure as a major barrier to e-procurement implementation.

## Conclusion

This study examined small contractors' perceptions of the benefits and challenges of adopting online tendering in Malaysia. The findings show that respondents generally perceive online tendering positively, with its benefits outweighing the associated implementation challenges. The main benefits identified relate to the improvement of procurement efficiency through reduced paperwork, lower printing costs, faster tender processes and easier access to tender information. Despite these benefits, several barriers were highlighted as influencing contractors' confidence in adopting online tendering. Most of the contractors agreed that inadequate support or training, data security concerns, limited IT skills and system reliability issues remained key barriers. The findings suggest that the main challenge facing small contractors is not access to digital technology, but the lack of sufficient institutional support for using online tendering platforms effectively. Basic connectivity and platform usability were perceived as less significant concerns. Instead, contractors need continuous guidance, technical assistance, and greater assurance regarding data protection.

Therefore, improving digital tendering adoption requires a balanced approach that focuses on technological development as well as strengthening user capability and organisational support. Based on these findings, several recommendations are proposed. Procurement authorities and industry organisations should provide structured training programmes and technical support tailored to small contractors to rebuild confidence and digital competency. In addition, procurement authorities and industry organisations should also consider measures to reduce financial barriers such as digital certification or platform-related costs to encourage wider participation. They should also establish clear cybersecurity guidelines and data protection mechanisms to improve contractors' trust in online tendering systems.

This study is limited by its focus on CIDB Grades G1–G4 contractors and its reliance on self-reported perception data from a cross-sectional survey. Future research could extend the investigation by including a broader range of contractor grades, adopting longitudinal approaches, or applying inferential modelling techniques to examine further the factors influencing online tendering adoption.

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## References

- Affendy, A. S., Isa, S. S. M., Ismail, W. N. W., Yusop, N., & Ismail, N. 'Ain. (2022). E-tendering system in the construction industry: Understanding the challenges and benefits from the developers' perspective. *International Journal of Academic Research in Business and Social Sciences*, 12(10), 2212–2221. <https://doi.org/10.6007/ijarbss/v12-i10/15025>
- Ali, S., Ahmad, M. B., Jenuwa, N., Dahlan, F. M., Bakar, N. A., & Zain, N. M. (2025). Challenges in adopting the e-tendering system among contractors in the Malaysian construction industry. *International Journal of Research and Innovation in Social Science*, 9(9), 8942–8953. <https://doi.org/10.47772/ijriss.2025.909000734>
- Anestri, D. R., Hidayat, B., & Suraji, A. (2025). Telaah kritis e-katalog pengadaan pekerjaan konstruksi berbasis persepsi PPK pada bidang cipta karya. *Jurnal Talenta Sipil*, 8(2), 789–797. <https://doi.org/10.33087/talentasipil.v8i2.977>
- Arman, U. D., Sari, A., & Arsyad, N. (2023). Analisis variabel kegagalan penawaran kontraktor lokal dalam e-tendering di Kota Padang. *CIVED*, 10(1), 159–167. <https://doi.org/10.24036/cived.v10i1.372112>
- Ashaari, N. I. M., S.K, S., & Chang, K. K. (2018). The implementation of e-tendering: The clients' perspective. *Journal of BIMP-EAGA Regional Development*, 4(1), 21. <https://doi.org/10.51200/jbimpegard.v4i1.3111>
- Aziz, N. M. (2024). Towards digital future: Unlocking strategies to integrate e-tendering in the construction landscape. *Planning Malaysia*, 22. <https://doi.org/10.21837/pm.v22i32.1500>
- Cook, C., Heath, F., & Thompson, R. L. (2000). A meta-analysis of response rates in web- or internet-based surveys. *Educational and Psychological Measurement*, 60(6), 821–836. <https://doi.org/10.1177/00131640021970934>
- Gong, X., Tao, X., Das, M., Liu, Y., & Cheng, J. C. P. (2022). Blockchain-based e-tendering evaluation framework. *International Journal of Automation and Digital Transformation*, 1(1), 75. <https://doi.org/10.54878/IJADT.131>
- Hamsyah, A. (2023). Bureaucratic reform based on e-procurement: Opportunities and challenges. *KnE Social Sciences*. <https://doi.org/10.18502/kss.v8i17.14101>
- Hanisah, R., Siti Hajar, Roziha, C. H., & Asrul, N., Md. (2025). Adoption of e-tendering system among small and medium enterprises (SME) contractors in Malaysian construction industry. The International Islamic University Malaysia Repository.
- Hayden, E., Chan, M., Kan, D. van, Arowoia, V. A., & Arifin, M. A. M. (2023). E-procurement in the Australian construction industry: Benefits, barriers, and adoption. In *Proceedings e report* (p. 489). Firenze University Press. <https://doi.org/10.36253/979-12-215-0289-3.47>
- Hilmi, R. R. A. R., Breesam, H. Kh., & Saleh, A. H. (2019). Readiness for e-tendering in the construction sector—Designing a computer programme. *Civil Engineering Journal*, 5(8), 1764. <https://doi.org/10.28991/cej-2019-03091369>
- Inusah, Y., Kazaz, A., & Ulubeyli, S. (2025). Barriers to e-tendering implementation in the construction industry: A comprehensive review and analysis of a decade and beyond. *Sustainability*, 17(5), Article 2052. <https://doi.org/10.3390/su17052052>
- Jiménez, A., Hanoteau, J., & Barkemeyer, R. (2022). E-procurement and firm corruption to secure public contracts: The moderating role of governance institutions and supranational support. *Journal of Business Research*, 149, Article 640. <https://doi.org/10.1016/j.jbusres.2022.05.070>
- Lin, L. Y., Jing, K. T., Thung, C. Y., & Yee, H. C. (2024). The readiness of the Malaysian construction industry for e-tendering after COVID-19 pandemic. *Journal of Advanced*

- Research in Applied Sciences and Engineering Technology*, 43(2), 220–236.  
<https://doi.org/10.37934/araset.43.2.220236>
- Mehdipoor, A., Iordanova, I., Mehdipoorkalooraz, S., & Ghadim, H. B. (2023). Implementation of electronic tendering in Malaysian construction industry: A case study in the preparation and application of e-tendering. *International Journal of Automation and Digital Transformation*, 1(1), 69–74.  
<https://doi.org/10.54878/s2wcrx08>
- Mpehle, Z., & Mudogwa, R. M. (2020). Utilisation of digital central supplier database in enabling electronic procurement in the Limpopo provincial departments. *Africa's Public Service Delivery and Performance Review*, 8(1), Article 356.  
<https://doi.org/10.4102/apsdpr.v8i1.356>
- Musarat, M. A., Alaloul, W. S., Zainuddin, S. M. B., Qureshi, A. H., & Maqsoom, A. (2024). Digitalisation in Malaysian construction industry: Awareness, challenges and opportunities. *Results in Engineering*, 21, Article 102013.  
<https://doi.org/10.1016/j.rineng.2024.102013>
- Nakamya, S. A., Gikandi, E. B., & Kizza, J. (2025). Effect of e-tendering practices on procurement performance of state corporations in Uganda. *Journal of Procurement and Supply Chain Management*, 4(1), 1. <https://doi.org/10.58425/jpscm.v4i1.314>
- Nchabeleng, L. S., & Ncube, E. D. (2025). An investigation on the factors affecting the adoption of e-procurement systems: A focus on the Mpumalanga Provincial Treasury. *Journal of Transport and Supply Chain Management*, 19, Article 1199.  
<https://doi.org/10.4102/jtscm.v19i0.1199>
- Ndubuaku, N. G., & Jerry, G. (2023). Utilizing e-tendering in the procurement of construction projects. In *Business, management and economics*. IntechOpen.  
<https://doi.org/10.5772/intechopen.107211>
- Voon, V. K. Y., & Lee, Y. L. (2025). Digital transformation in construction: Assessing e-tendering adoption in Malaysia's industry landscape. *International Journal of Research and Scientific Innovation*, 11(12), 969–985.  
<https://doi.org/10.51244/ijrsi.2024.11120084>
- Watt, S., Simpson, C., McKillop, C., & Nunn, V. (2002). Electronic course surveys: Does automating feedback and reporting give better results? *Assessment & Evaluation in Higher Education*, 27(4), 325–337. <https://doi.org/10.1080/0260293022000001311>
- Wu, M.-J., Zhao, K., & Fils-Aime, F. (2022). Response rates of online surveys in published research: A meta-analysis. *Computers in Human Behavior Reports*, 7, Article 100206.  
<https://doi.org/10.1016/j.chbr.2022.100206>