



# INNOVATIVE CONSTRUCTION REPORT 2024

**Royal Institution of  
Surveyors Malaysia  
(RISM)**

QS Division

# INNOVATIVE CONSTRUCTION REPORT 2024

**February 2024**

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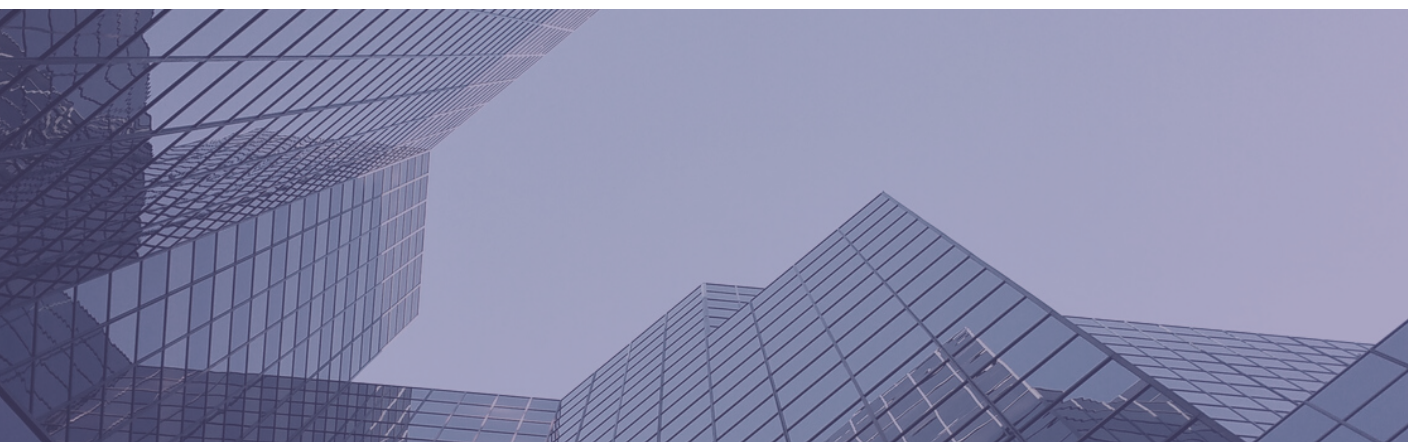
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# Forewords

Greetings,

As Chair of the Quantity Surveying Division, it is with great pleasure that I introduce this insightful and crucial report emanating from the dedicated efforts of our Innovative Construction Committee. In the realm of Quantity Surveying, the winds of change are blowing, urging us to embrace the transformative power of digitalization for a more efficient and sustainable future.



In the vast landscape of Malaysian construction, conventional methods still dominate, posing a challenge for the widespread adoption of digital practices. This report comes at a pivotal moment, aligning with strategic initiatives such as the Construction 4.0 Strategic Plan and the Ministry of Work Organisational Strategic Plan. It underscores the urgency to integrate smart, integrated technology, innovation, and infrastructure in our industry.

The Innovative Construction Report 2024 aims to unravel the current status of digital adoption among quantity surveyors in Malaysia. Recognising the limited exposure to digitalization, we embark on a journey to understand, quantify, and subsequently enhance the digital landscape within our practices. This study serves as a crucial statistical reference, shaping actionable plans and empowerment programmes for the members of RISM's QS Division.

At its core, this report is not merely a snapshot of the present; it is a visionary benchmark for future studies, signalling the inception of annual endeavours to gauge and elevate the digitalisation levels within Malaysian QS practices. The findings contained herein will guide us in bridging the gap and aligning with the needs of our construction industry, particularly through the lens of the decarbonisation agenda.

## Forewords (Cont'd)

Our gratitude extends to the lead author, Sr Dr. Norsyakilah Romeli, and the co-authors and Innovative Construction Committee members: Sr Dr. Nazirul Fariq Mohd Kassim, Sr Desmond Loi, Dr. Zafira Nadia Maaz, Ts. Sam, and Sr Sharifah Noraini Noreen. Their collective expertise has steered the course of this report, rendering it a beacon for change.

This report is more than an academic exercise. It is a call to action. It urges us to embark on the digitalisation journey and harness the power of technology for positive change. As we face the hurdles outlined in this report, it becomes a roadmap for QS professionals in Malaysia, guiding us towards a resilient and sustainable future.

I extend my sincere appreciation to the contributors and researchers who dedicated their time and expertise to this endeavour. Your commitment ensures that this report not only serves as a milestone, but also as a catalyst for future advancements. I encourage all readers to delve into the details, engage with the insights, and be part of the collective effort to shape the future of Quantity Surveying in the digital era.

Thank you.

**Sr Nazir Muhamad Nor**  
**Vice President (QS)**  
**2023 / 2024**

# Executive Summary

Digitalisation among Quantity Surveyor (QS) practices is imperative as an alternative strategy to expedite the time savings in QS task implementation. Digitalisation strategies are believed to contribute to sustainable development and green technology fields, where bringing positive environmental impacts and resource savings is the primary concern of these efforts. Other than that, the exposure of QS to promoting digitalisation is considered limited due to the conventional way is still widely practiced in the Malaysian landscape. In line with the Construction 4.0 Strategic Plan (2021-2025) by the Construction Industry Development Board Malaysia (Strategic Thrust 3: Smart Integrated Technology, Innovation, and Infrastructure) and the Ministry of Work Organisational Strategic Plan (KKR OSP) (2021-2025) (Strategic Thrust 2: Expanding the use of technology, innovation, and digital in development and infrastructure maintenance), digitalisation in Malaysian construction practices shall be implemented to ensure the optimal benefits obtained in action plans, monitoring, and evaluation processes through the decarbonisation agenda.

To support the digitalisation and sustainability agenda, the Innovative Construction Report 2024 is targeted to explore the digitalisation adoption among quantity surveyors' practices. Hence, the objective of this study is to understand the current digital adoption among quantity surveyors in Malaysia. This study is critical as it also serves as a statistical reference for the Royal Institution of Surveyor Malaysia's (RISM) QS Division's actionable plan and empowerment programme for its members. This report is also essential, as it can serve as a benchmark for future studies and as the beginning of digitalisation reports that can be pursued annually to ensure the digitalisation level of Malaysian QS practices is measurable. Therefore, the improvisation on the digitalisation thrust will be enforced accordingly to fill in the gap and meet the needs of the Malaysian construction industry's landscape.

The research survey has a periodic timeframe for awaiting responses from the participants. The Royal Institution of Surveyor Malaysia (RISM) Announcement [QS] No. 9/63rd Session 2023/2024 on October 2023 until December 2023. The key findings for this report are comprised of digitalisation adoption level and solutions identified, where the demographic data were collected and analysed accordingly. In addition, the QS practice and phase driven by digitalisation were discussed according to the perceptions gained from the participants. Other than that, the barriers towards digitalisation among the QS profession were acknowledged and assessed accordingly.

# Introduction

The digitalisation adoption in construction industry practices in Malaysia is remarkably high in demand for construction practices in the architecture and engineering industries. Despite the lack of enforcement and practical skills in implementation, digitalisation has been concluded to be a mechanism that enables benefits for construction players that supply accurate information on project progress, quantification, and design. Highly renowned for their potential to provide accurate information and minimise error, digitalisation efforts have been actively practiced in many areas of construction projects. In QS practical settings, the most common practices of digitalisation have covered cost estimation, the design process, engineering, project scheduling, quality management, etc. To support this technology adaptation on a large scale, the government shall play a prominent role in encouraging the digitalisation implementation towards the sustainability of the nations.

Over time, the Malaysian government, through various agencies, has gradually published various documents related to technology implementation in the construction industry, including from the perspective of professional bodies, opinionated guidelines, and the route of technology operation. In Malaysia, building complexes and repetitive designs often opt to use digitalisation as a tool to speed up the construction period, help construction consultants design and do cost estimates, and at the same time, help contractors track progress on the building construction.

Nonetheless, with the massive utilisation of digitalisation technologies in Malaysia, the absence of the data, statistics, and benchmarking input of a digitalisation agenda has been a pressing issue that required certain evidence to support the actions and protocols further to be made. The decision to adopt the digitalisation tools was hardly to be made due to the existing level of QS practices in digitalisation strategies being unclear, hence the investment in the up-to-date cost estimation software was delayed as a result of a lack of confidentiality towards the technology-driven approach to QS fundamental tasks. Other than that, pressing issues with big data, such as ownership, intellectual property, and unclear roles and responsibilities among the digitalisation parties involved in technology-driven projects, were prone to bringing construction projects into dispute and legal charge situations. These circumstances result in a fear mongering among the newly digitalisation practitioners who are careful to invest in cost management software, whose outcome would negatively affect the three important configurations (performance, time, and money) due to improper technology strategy planning and risk mitigation.

Therefore, along with the big data and digitalisation eras, the adoption issues of QS implementation pertaining to cost and quantification software are essentially to be discussed further. The support and sharing from the governing bodies were imperatives to portray the familiarity of the QS practitioners in Malaysia with adapting the digitalisation strategies since the utilisation of the applications required integrated participation from all parties.

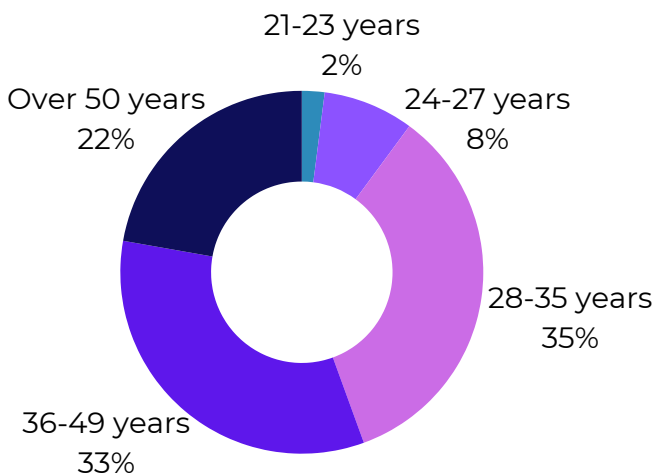
# 1 Digitalisation Adoption by Quantity Surveyors in Malaysia

Digitalisation adoption from the context of this study is the process of integrating digital practices and technologies using specific digital tool and platform that typically used by the QS professionals into an individual's or organisation's workflow. This involves a wide range of work activities from inception phase up to operational phase by the QS in Malaysia.

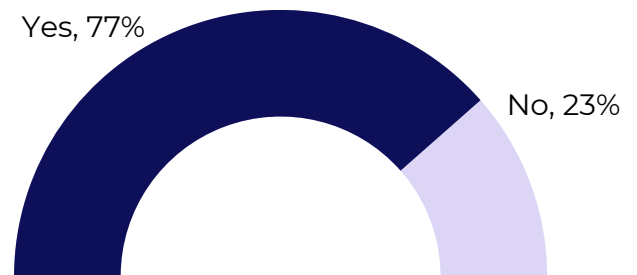
## 1.1 Age of Participants and Members of RISM

Figure 1 shows the majority participants were coming from age of 28-35 years old (35%). Meanwhile, the least participation was from age groups of 21-23 years old (2%), which is the range for fresh graduates involved in quantity surveying practices and the construction industry.

Additionally, the statistic recorded in Figure 2 shows that 77% of the participants are registered members of the Royal Institution of Surveyor Malaysia (RISM), while 23% of them are not registered members. This shows that the survey has also reached out to non-members, and the topic of digitalisation gained the interest of these participants.



**Figure 1** Age of Participants

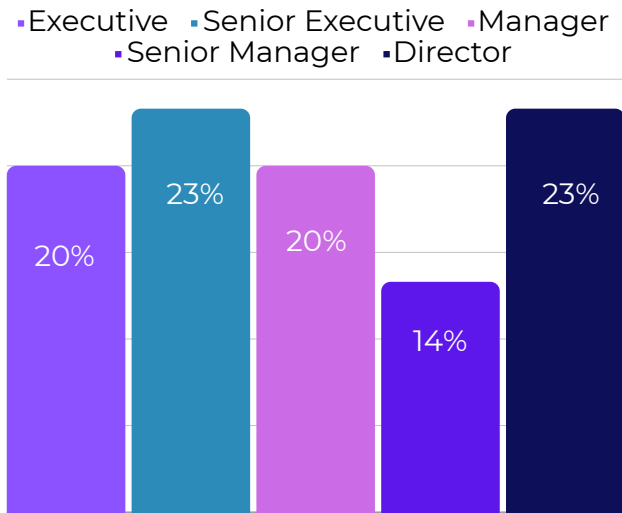


**Figure 2** Members of RISM

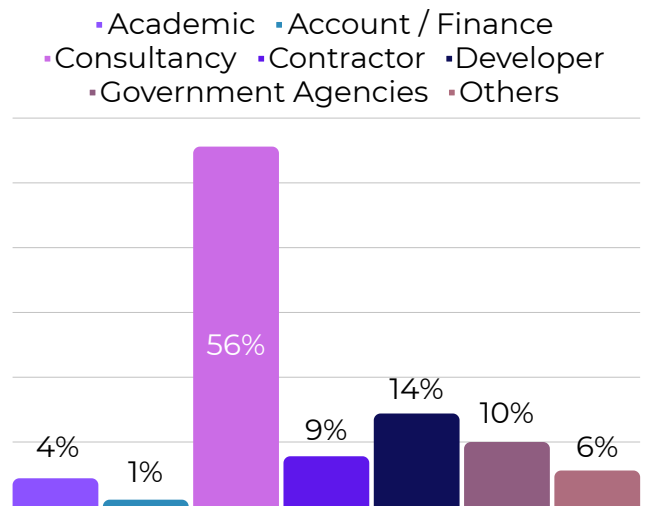


### 1.2 Working Level Experience

The demographic data in Figure 3 resulted in the majority of participants working level experiences coming from Senior Executive (23%) and Director (23%), which is tailored to the majority of the age group of 28–35 years old. The involvement of seniority levels (80%) in this study can strengthen the justification with a higher standard of validation.



**Figure 3** Working Level Experience



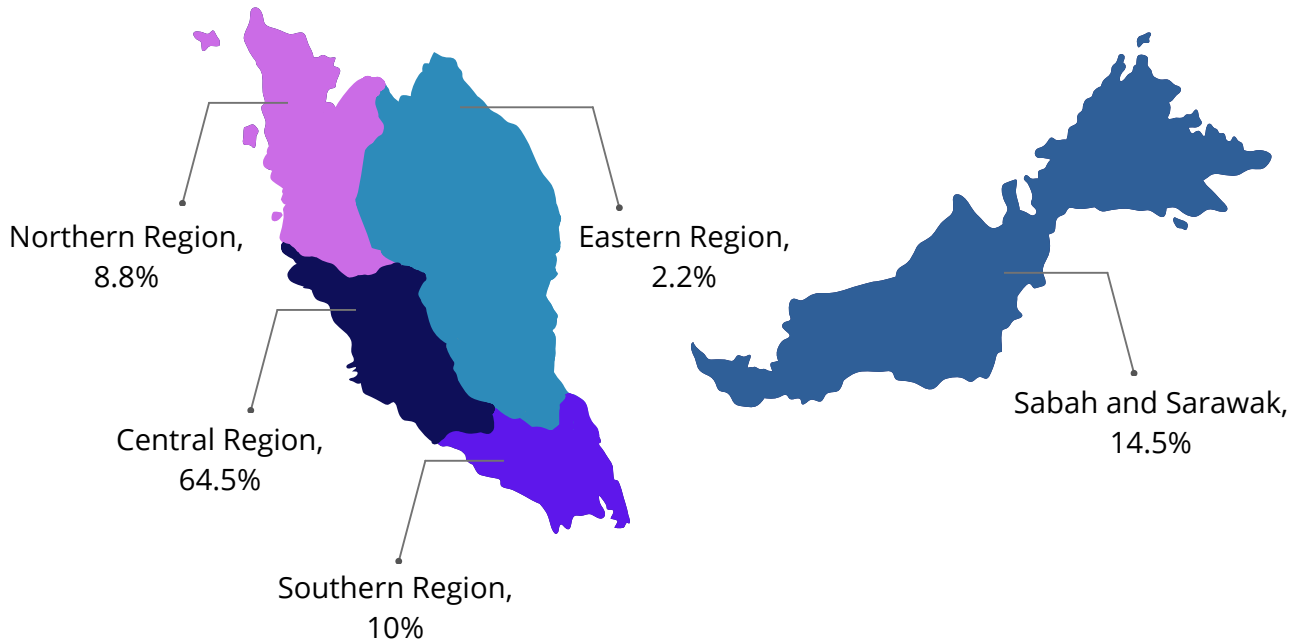
**Figure 4** Organisation Nature of Business

### 1.3 Organisation Nature of Business

The demographic data portrayed in Figure 4 shows the highest contribution coming from the Consultancy perspective (56%), whereas the lowest contributions were coming from the QS involved with the Account / Finance organisation (1%). The rationale for consultancy participation is elevated due to the exposure to digitalisation, where digital tools typically excel in expediting tasks during the pre-tender stage and ensuring they deliver the deliverables within the stipulated time.

## 1.4 Participants by Regions

The survey was gathered from all participants practicing in Malaysia. Malaysia is divided into five (5) regions, which are the Northern Region (Perlis, Kedah, Pulau Pinang and Perak), Central Region (Selangor, Wilayah Persekutuan and Negeri Sembilan), Eastern Region (Pahang, Terengganu and Kelantan), Southern Region (Melaka and Johor) and Sabah and Sarawak as illustrated in Figure 5.

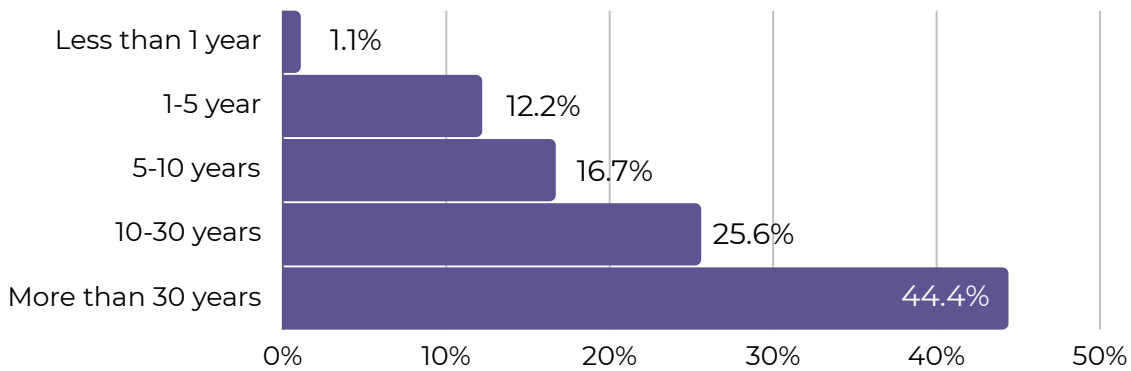


**Figure 5** Accumulated Participants by Regions

The highest participation was obtained from the Central Region (64.5%). The lowest participation was obtained from respondents in the Eastern Region (2.2%). The other region stated moderate participation, whereby the Northern Region (8.8%), Southern Region (10%), Sabah and Sarawak (14.5%) recorded respectively. The large participation's contradiction between those two regions is predicted based on location, whereby the Central Region is normally considered a digitalisation hub, where further technology adoptions often develop on the central side of the country.

### 1.5 Years of Organisation Establishment

In terms of the years of organisation establishment, the majority of participants were involved with the organisation that has been established for more than 30 years (44.4%) as per Figure 6. Meanwhile, it is recorded that only 1.1% of organisational establishments were less than a year.

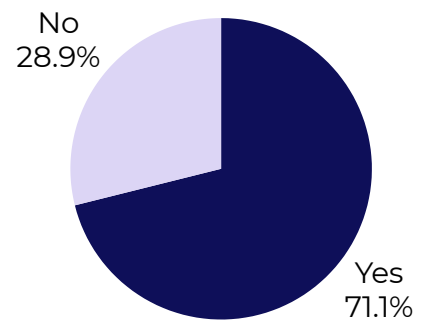


**Figure 6** Years of Organisation Establishment

This result shows the reliability of the data, whereby the perception recorded is based on well-established organisations that possess better experience handling projects with a digital approach.

### 1.6 Overall Digitalisation Adoption by QS

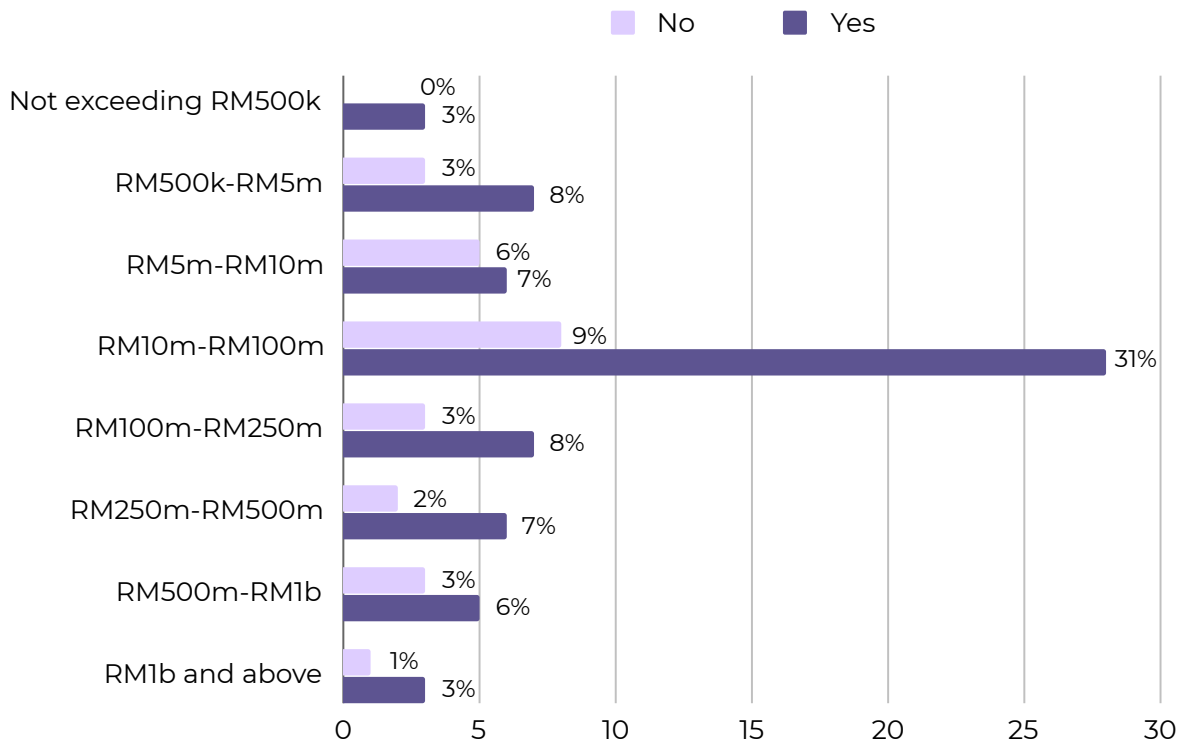
Generally, the results indicated that among all the participants, the digitalisation adoption was at the high level, where the majority of the participants answered Yes (71.1%). Meanwhile, the rest of the respondents answered No (28.9%). The data shows that digitalisation level can be measured by the substantial awareness of QS in handling digitalisation adoption solutions in their organisations, respectively as shown in Figure 7.



**Figure 7** Overall Digitalisation Adoption

### 1.7 Relationship of Digitalisation Adoption and Project Value

The data portrayed in Figure 8 indicates the relationship between digitalisation adoption and project value. The highest adoptions were in the range of RM10 million–RM100 million, which the adoption has been ranked in first place (Yes: 31%). Followed by a range of RM500k–RM5 million and RM100 million–RM250 million, participants responded Yes: 8% respectively. The lowest project range adoptions were RM1 billion and above and Not exceeding RM500k, where both recorded Yes: 3%.

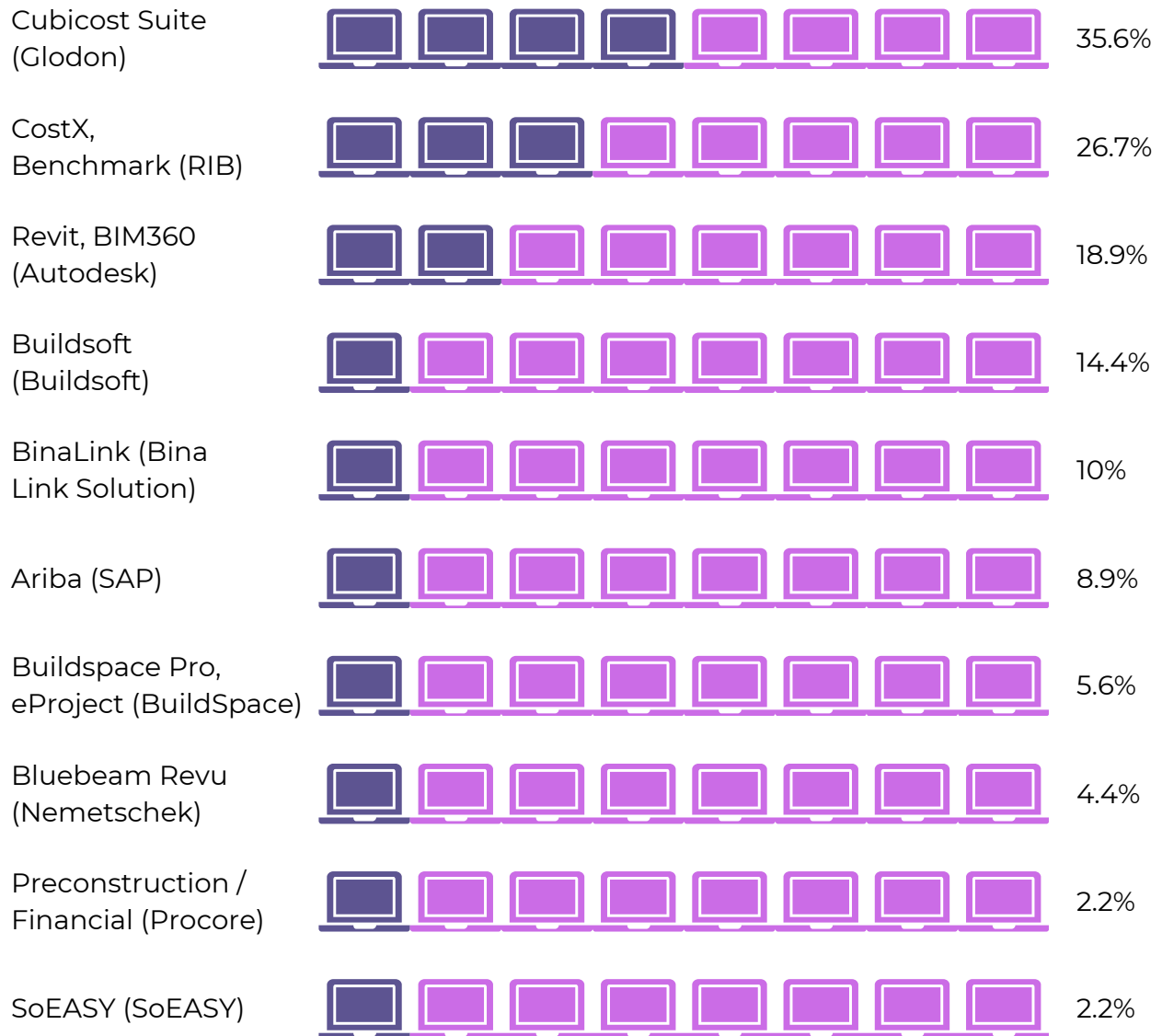


**Figure 8** Relationship of Digitalisation Adoption and Project Value

Based on this result, it can be said that there is no significant project value that influences digital adoption in a construction project. The decision to adopt could be due to factors such as the needs of the project owner, organisation’s long-term strategy, sustainability concerns, project complexities, etc. However, the accumulation of larger project scales, such as those exceeding RM10 million, often correlates with stronger digital adoption among the QS in the Malaysian construction industry.

### 1.8 Digital Tools or Platforms Used in Organisation

To understand the digital landscape of QS professionals in Malaysia, this study queried participants about a total of 30 digital tools or platforms they most rely on for their tasks and everyday work. In the study, the participants can select more than one answer, as some organisations may adopt multiple tools or platforms to support them throughout the project lifecycle, among many other reasons.



**Figure 9** Typical Digital Tools or Platform Used by QS in Malaysia

Figure 9 shows top 10 digital tools or platforms and digital technology providers that have been used by the participants that adopt digitalisation in their practice and everyday work activities. Thus, this can guide QS professionals to explore new skills and self-learning development by understanding the typical digital tools or platforms (function, workflows, etc.) that being used by other QS professionals in Malaysia, who possess the experience and opportunity for digitalisation adoption.

# 2 QS Services or Activities Driven by Digitalisation

## 2.1 QS Services or Activities Driven by Digitalisation

More insight is needed to bridge the gap between current digitalisation practices and their full potential benefits for quantity surveying services or activities, we must first analyse specific services driven by digital tools or platforms, such as building information modelling (BIM)-based cost estimation and digital take-off solutions.

By analysing these service areas, we can identify key bottlenecks and opportunities for targeted improvement. This understanding will guide the development of specific interventions, like targeted training programmes and workflow streamlining, leading to maximum digitalisation adoption and unlocking the full potential of technology implementation within the organisation. The QS services driven by digitalisation adoption are presented in Figure 10 below.

The highest scores were on Measurement and bills of quantities at 76.7%, followed by Cost planning and estimation at 66.7%, which ranked second. The third rank is Interim valuation, payment, and management at 44.4%. The lowest service is Waste management and sustainability (2.2%), Capital allowance or tax depreciation (4.4%) and Holistic life cycle costing studies, and Insurance replacement valuations at 5.6% respectively.

2.1 QS Services or Activities Driven by Digitalisation (Cont'd)

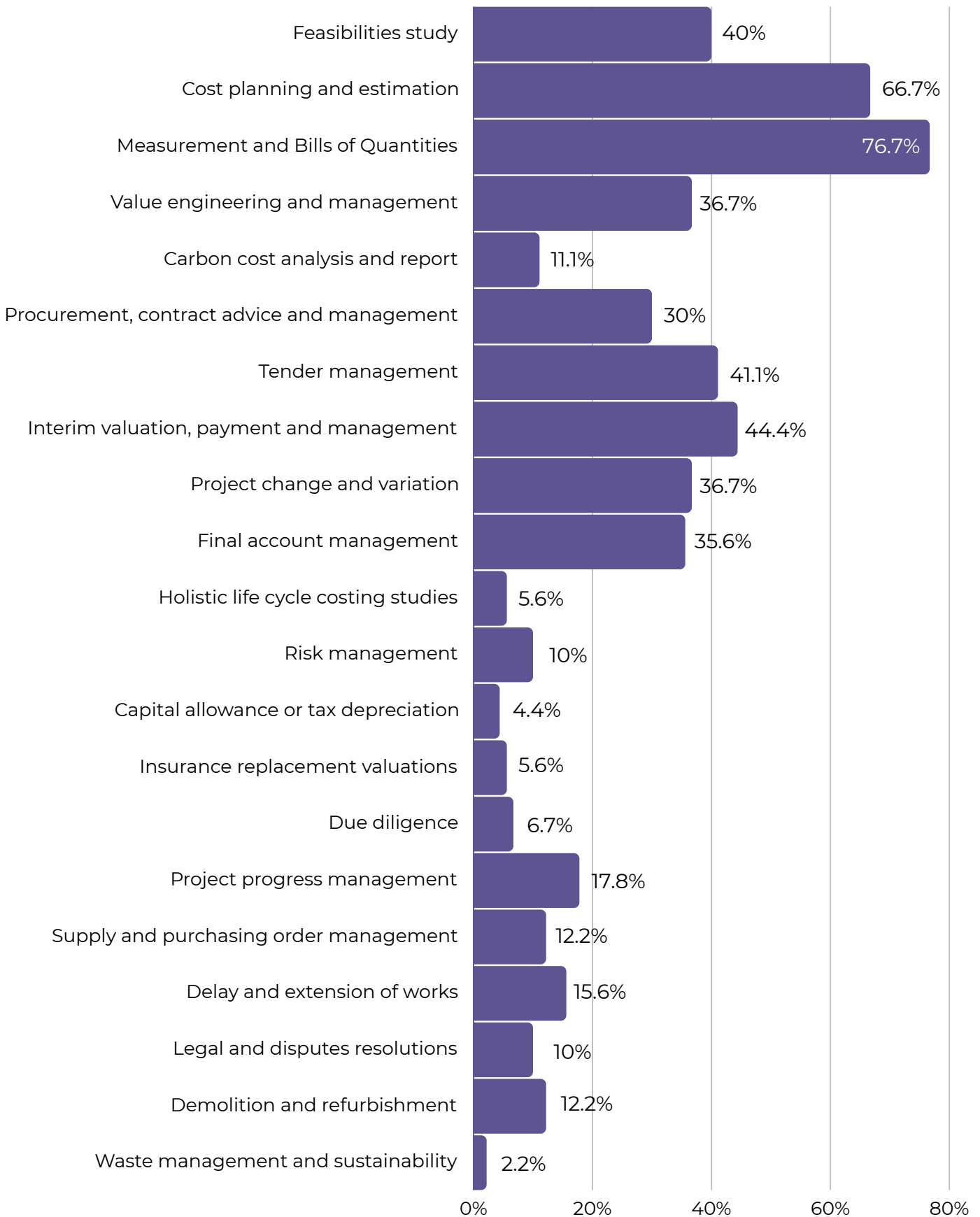


Figure 10 Overall Digitalisation Adoption

## 2.1 QS Services or Activities Driven by Digitalisation (Cont'd)

The data shows that the outmost service or activity is driven by the digitalisation adoption, where Measurement and bills of quantities activity belong to the pre-tender stage. The factors that are hindering the pre-tender stage from meeting its stipulated timeline are often affected by the meticulous pre-tender stage activities. Where uncertainties on the scope of work occur, site conditions, changes in specification and materials, and variations are the main factors affecting the speed of the tendering process. This is because the changes are inevitable due to the client's preference and site conditions, as the circumstances vary according to the nature of the projects.

In the event of a post contract stage, it is crucial for the QS to keep up with the project progress and interim payment. While some digital tools may be able to offer synchronisation updates on rate (where the rate rationalisation occurs), easy to cross-check and compare work done progress and payment information, etc., digitalisation adoption during the post contract stage can significantly optimise the process. On the other hand, the dispute in terms of project progress can be solved based on the digital prints and evidence, which indicate the actual progress on site based on an accurate scale and measurement.

As a conclusion, current digitalisation efforts in quantity surveying have not fully infiltrated crucial areas like value engineering, tender management, risk management, variations, and contract management. These activities are still lag behind, clinging to manual processes and siloed data. To propel them into the digital age, a transformative shift is needed. Such a transformation would not just optimise workflows but empower QS professionals in Malaysia to bridge the digital divide in these critical areas and unlock the full potential of technology in the practice.



# 3 Barriers to Digitalisation

## 3.1 Barriers to Digitalisation Adoption

The adoption of digital platforms presents a promising paradigm shift for quantity surveyors, offering greater efficiency, accuracy, and collaboration. However, the path to digitalisation is strewn with several significant roadblocks that hinder progress for quantity surveyors in Malaysia. Table 1 below ranked the barriers to digitalisation adoption by the quantity surveyors in the country.

Barriers to Digitalisation Adoption			
Cost of licensing and maintenance	1	No mandate by the government or stakeholders	10
Cost of new recruit people development and training	2	No demand from the private sector or stakeholders	11
Cost of hardware and infrastructure	3	Uncertain of the benefits or Return on Investment	12
Lack of time for learning due to work commitments	4	Inability of software to collaborate with other systems	13
Lack of standards and universal guidelines	5	Unwillingness by supply chains	14
Lack of procurement and contractual protocols to safeguard user's rights	6	Unfriendly user interface or difficult to learn	15
Inability to integrate with other BIM practitioners	7	Potential of data breach and security	16
Behavior resistance to change and adapt	8	Required multiple digital tools to perform task	17
Collaborative liability issues	9	Lack of flexibility for customization to address complexity of construction projects	18

**Table 1** Overall Digitalisation Adoption

### 3.1 Barriers to Digitalisation Adoption (Cont'd)

Firstly, financial considerations pose a formidable challenge. The initial investment required for software licenses, hardware upgrades, and employee training can be substantial. Additionally, ongoing maintenance and support costs further contribute to the financial burden. This can be particularly daunting for smaller organisations or those operating with tighter margins.

Beyond financial concerns, time constraints present a significant obstacle. Busy schedules and demanding workloads leave little room for quantity surveyors to dedicate to learning new technologies and adapting to unfamiliar workflows. This lack of time, coupled with the inherent complexities of implementing new systems, can create reluctance and resistance to change.

Technical hurdles further impede the digitalisation journey. The absence of standardised protocols and universal guidelines across the practice of quantity surveying creates confusion and hinders seamless collaboration with other BIM practitioners in the industry. Furthermore, concerns regarding user rights and data security in collaborative environments, as well as the ambiguity of liability in the digital realm, introduce additional layers of complexity that can dissuade potential adopters.

Finally, the lack of a clear mandate or strong push from government or key stakeholders can further slow the pace of digitalisation. Without external encouragement and support, companies in Malaysia may be hesitant to prioritise investments in technology or commit to significant changes in their established workflows and services.

By tackling these challenges head-on and adopting a collaborative approach, quantity surveyors in Malaysia can pave the way for a smoother transition into the digital future, unlocking its transformative potential and securing their continued success in a rapidly evolving landscape.

### 3.2 Recommendations to the Stakeholders

While digitalisation offers immense potential for progress and development for QS practice, its path is often paved with issues and challenges. This section delves into actionable recommendations to relevant stakeholders tailored to address each identified barrier and pave the way for a better and more successful digitalisation journey.

#### a. Financial Planning and Constraints

In terms of financial planning and constraints, it is advisable for technology providers to publish data showcasing the return on investment (ROI) to organisations' top management and the added value resulting from the digital transformation. Other than that, implement digitalisation strategies in phases and in a coordinated manner to ensure smooth integration and optimal outcomes. It is important to plan and allow at least RM20,000 to RM40,000 (approximate amount for 3–4 licences) for annual spending on software licencing and training. Other than that, government incentives for green initiatives or digital tools are limited and hard to obtain. Therefore, it is recommended that policymakers allow certain incentives related to quantity surveying practices.

Foster a comprehensive understanding among C-level executives that investment in technology requires constant development and a coordinated approach involving people, processes, and technology. This also involves acknowledging the need for continuous maintenance and improvement in parallel with technological advancements over a period of time. Raise awareness among stakeholders, especially QS regarding the importance of technology investment and adoption, emphasising alignment with the United Nations' Sustainable Development Goals (SDGs) for more impactful integration and stakeholders willingness to invest. Other than that, making the adoption of technology part of corporate ESG's compliance to acquire green financing is the best way to boost the digitalisation level.

It is recommended that the organisation set achievable and measurable outcomes that are initiated at all levels of the organisation, which include the operational, management, and leadership levels. Therefore, each level can set measurable key performance indicators (KPIs). For organisations to establish what they want to achieve as the end result before investing in digitalisation in quantity surveying practice. Digitalisation has a very wide scope, and it is important to begin with the end in mind. It is also imperative to establish the SMART framework concept (specific, measurable, attainable, realistic, and timely) in order to measure and gauge the progress of adopting a wide range of digital solutions. Therefore, the measurable KPIs can ensure the investment can be justified quantitatively.

Relevant stakeholders:

- Industry organisations
- Government department or agencies
- Technology providers

### 3.2 Recommendations to the Stakeholders (Cont'd)

#### b. Training and Development

It is recommended to set realistic goals for training and development. To break achievement into multiple phases, allowing people to grow gradually in adapting to the digitalisation agenda. Continuous engagement with the employees and simplify daily tasks by engaging a small portion of technology adoption as a starter to normalise the digital culture in the organisation. Employers can encourage employees to facilitate learning integration into their daily work activities, including the practice of 'learning by doing'. The training will bring benefits in fine-tuning towards career goal alignment. Other than that, it shows the organisation's commitment to employee development by allocating sufficient resources. It signals to industry professionals, particularly QS, that learning culture is valued.

The Human Resources Development Fund (HRDF) is by far the best medium to offset the training and development costs of construction stakeholders, enabling employers to invest in upskilling industry professionals in Malaysia. In addition, academic institutions must be able to provide ready-and-able digitally trained workforces for the market to avoid workforce 'pinching' when they are trained by certain organisations. More employers should be encouraged to use the mandatory HRDF fund for staff training in a digital environment. It is also advisable for employers to set KPIs or gauges to measure the success of digitalisation adoption. QS trained with digital technology skills should be rewarded with incentives to encourage them to self-upgrade their knowledge.

Encouragement through a mentor-mentee scheme can be introduced so that the employees are not scared of embarking on digitalisation adoption. Employers must be able to provide training through structured and systematic change. By attending more industrial training and certification programmes, it can increase QS skills in digital implementation and best practices. Design training programmes that provide exposure to real-life scenarios and projects, fostering a deeper, hands-on understanding and rapidly increasing talent capability. Rather than one-off training, consider extending these programmes into comprehensive talent development initiatives. Local authorities should actively engage in this process, offering talent awards based on measurable growth in specific technologies. This approach not only inspires talent but also ensures accountability in talent development efforts.



#### **Industry-Driven Programmes and Empowerment**

Empowering people to continuously learn and adapt is vital for strengthening the foundations of the practice and ensuring sustainable growth for QS in Malaysia. This will solidify quantity surveying's relevance and value within the industry.

### 3.2 Recommendations to the Stakeholders (Cont'd)

#### b. Training and Development (Cont'd)

Relevant stakeholders:

- Technology providers
- Government department or agencies
- Professional institutions
- Industry organisations
- Academic Institutions
- QS professionals

#### c. Integration and Collaboration

In achieving the effectiveness of digitalisation adoption in quantity surveying practice, it is important to look for reliable, trusted and highly credentialed technology partners that are able to foster integration and collaboration among industry professionals. Set clear expectations so that all of the practitioners will be aware of their responsibilities and commitments in the adoption process. Interoperability between software applications needs to be improved. Ownership of data and project information needs to be clearly stated and clarified to all parties, including the liability to inculcate trust. Developers need to be aware of the limitations and frictions of different combinations of software applications. A quantum of POC (proof of concept), workflows, and standards need to be carried out prior to implementing them in the project.

Recognise the importance of the interoperability of technology solutions in the Malaysian construction industry, particularly for quantity surveying practice. Currently, the digitalisation process is still in silo, where construction professionals utilise various technological solutions in a single work process. It is crucial for construction stakeholders and technology providers to be aware of the significance of designing flexible technology solutions. These solutions should prioritise seamless work process performance over treating isolated technologies as unique selling points. Address awareness by mitigating the lack of common knowledge about data breaches and security within the Malaysian construction industry. It is imperative to raise awareness about the specific technicalities of data breaches and security in terms of technology and data management processes. Addressing this knowledge gap is crucial for accelerating digital transformation and improving digital collaboration among stakeholders.

### 3.2 Recommendations to the Stakeholders (Cont'd)

#### c. Integration and Collaboration (Cont'd)

Consequently, collaboration among software providers, technical experts, academia, and local authorities is essential to championing digitalisation adoption. The regulators can take the lead in establishing industry-wide standards or processes for addressing data breaches and security. This initiative ensures that future technological solutions or developments incorporate robust data breach and security measures, promoting safer digital transactions in the construction industry, especially commercial-related matters that are typically associated with quantity surveying practice. The mix-and-match adoption that can allow flexibility in digital solutions remains a challenge, as there is no total solution to cater to all requirements. Harness partnerships with supply chains to share best practices through collaborative projects or initiatives to demonstrate the advantages of digitalisation adoption. Develop clear and comprehensive project protocols that stipulate the roles and responsibilities, as well as a risk-sharing mechanism.

Relevant stakeholders:

- Other construction professionals
- Industry organisations
- Technology providers



#### **Research, Development and Collaboration**

Extensive research must continuously be conducted to plan for strategic action for the development of practice in Malaysia. Strategic collaboration with relevant stakeholders, coupled with initiatives to refine standards and processes, can transform quantity surveying into a driving force for digital advancements in the Malaysia construction industry.

### 3.2 Recommendations to the Stakeholders (Cont'd)

#### d. Technical Capabilities and Solutions

Having a QS practice expert as a mentor in pursuing technology adoption can provide a holistic level of focus and understanding in relevant perspectives. By giving a sufficient level of focus on digitalisation adoption, the strengths, weaknesses, opportunities, and threats from its adoption will be identified to find the gaps in the quantity surveying practice. Once the technological adoption culture is developed, the establishment of case studies enables the team to forgo forensic assessment in certain project circumstances. Therefore, the complexity of each project can be identified, and the technical solutions can be outlined to overcome the issues based on the project.

Provide continuous support to QS professionals by showcasing project cases that adopted digital solutions to increase understanding of their implementation process and values. Other than that, interoperability between software applications needs to be improved, especially between authoring tool platforms like Autodesk's Revit and cost management platforms like Glodon's Cubicost and CostX. This inability to read the data from one source to another delays the progress of digitalisation.

Besides, ensure implementation of encryption for BIM data both in transit and at rest to enforce strict access controls and limit permission. Conduct regular security audits and assessments of the data that is stored in the system. It is also recommended to enforce data encryption. It is also advisable to perform penetration testing to identify weaknesses in the security infrastructure, establish procedures, and understand the legal obligations for managing data and information.

Relevant stakeholders:

- Industry organisations
- Technology providers

### 3.2 Recommendations to the Stakeholders (Cont'd)

#### e. Working Culture and Mindset Shift

Building a passionate team to refresh the mindset of the working culture towards digitalisation adoption. Instilling the employees with the company's mission and objectives can reduce friction in the organisation and create a new culture towards digitalisation. Cultivate digital working habits and culture in daily routines and monitor its effectiveness in every phase. Digitalisation adoption may require the involvement of multiple departments, and having a champion in every department can help drive change in the organisation as a whole. Crucial leadership role in championing a digital mindset from the top down. The leadership level plays a pivotal role in advocating for and fostering a culture of digital transformation within the organisation.

In a sense, creating incentives for employees when the digitalisation adoption is successful is one of the motivations for them to reiterate the process over time. However, it is important that employees understand the rationale behind the imperative for digitalisation adoption. Other than that, a culture and mindset must be nurtured from the beginning of a career and integrated into the working processes with more professionals at the senior level. It is important to stay abreast of the fast-moving and changing new developments in digital technologies. Academic institutions shall align their knowledge with the latest trends and developments, demonstrating that organisations are staying competitive and future-focused in the industry.

Relevant stakeholders:

- Professional institutions
- Industry organisations
- Academic Institutions
- QS professionals



#### **Process and Standard Improvement**

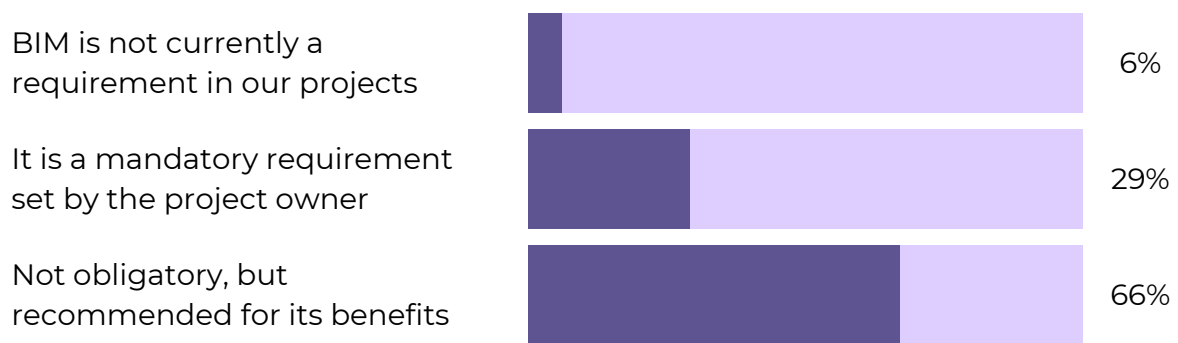
Efforts should focus on integrating digital tools and workflows into practice through process improvement for QS in Malaysia. Existing available standards should be leveraged when applicable, while new ones to be established where necessary. Additionally, embracing available technologies and fostering a robust digital culture are crucial.



### 3.3 Supplementary Report: Obligation Use of BIM

A webinar event titled ‘Back to Basics: BIM for QS’ was conducted on January 15, 2024. It is a joint-organised webinar by the committees of QS Academy and Innovative Construction. A total of 205 participants attended the event.

During the webinar, a survey was carried out to understand the current obligation of using BIM in construction projects in Malaysia. As shown in Figure 11, the majority (67%) reported that, while it is not obligatory, it is recommended to use it for its benefits. This corresponds with ‘Uncertain of the benefits or Return on Investment’ in Table 1 as one of the insignificant barriers to digitalisation adoption.



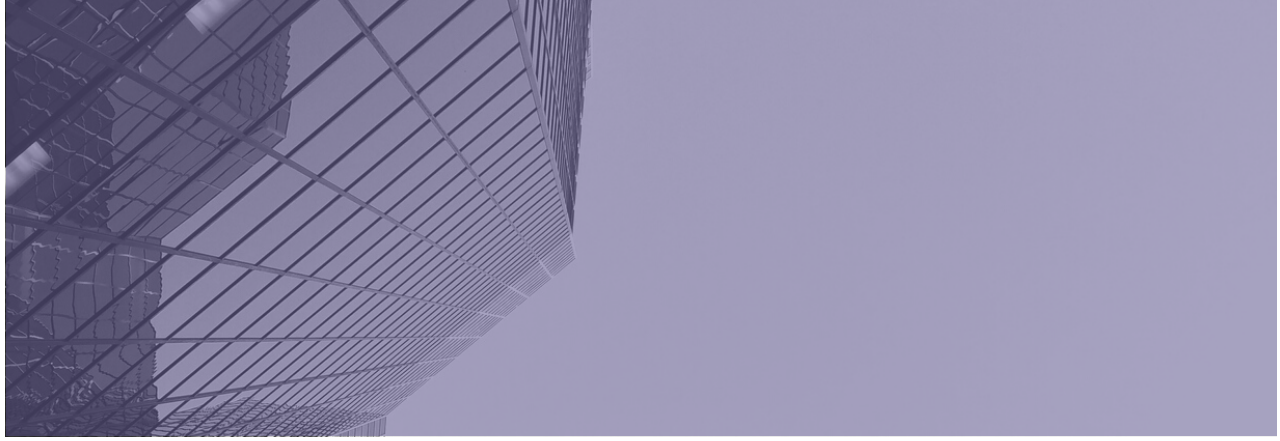
**Figure 11** Obligation Use of BIM

# Report Summary and Conclusion

This report has identified the current situation of QS professionals in Malaysia in terms of digitalisation adoption. By knowing the pace and across various demographics, individuals and organisations can make informed decisions about their own digital strategies and shape a future where digitalisation adoption can contribute positively to QS practice and industry as a whole.

Secondly, the area of improvement must be recognised to give a sense of direction and purpose for QS professionals in the expedition of digitalisation adoption. In this study, QS services or activities driven by digitalisation have been investigated to advocate for unlocking the potential and values of QS professionals in Malaysia. to give a sense of direction and purpose for QS professionals in the expedition of digitalisation adoption. In this study, QS services or activities driven by digitalisation have been investigated to advocate for unlocking the potential and values of QS professionals in Malaysia.

As there are still gaps for improvement and specific barriers that decelerate the digitalisation adoption of QS professionals, The accomplishment of achieving the objectives in this study and the recommendations to these barriers that have been grouped into financial planning and constraints, training and development, integration and collaboration, technical capabilities and solutions, and working culture and mindset shift are hope able to alleviate the set of circumstances of QS practice in the Malaysian construction industry in the future.



## Vision

- To be recognised as an innovative and dynamic world-class professional surveying Institution.
- To provide quality, value-added and comprehensive services.
- To be the centre of excellence in surveying.

## Mission

- To continuously improve the standards of professional practice and ethics.
- To promote the welfare and professional development of members.
- To expand by incorporating related disciplines into our profession.
- To continue to be relevant and of benefit to the public.

## Values

- We recognised the need to be honest and accommodate in all undertakings.
- We respect the equality of individuals on gender, cultures and beliefs and have a high sense of social responsibility.
- We seek quality in technology, standards and services.



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