



UNIVERSITI
TEKNOLOGI
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Cawangan Perak

ISCU 2025

17TH RISM INTERNATIONAL SURVEYING CONFERENCE FOR UNDERGRADUATES

Embracing Construction Revolution 4.0 (CR4.0): Transforming Malaysia's Built Environment

16th - 17th May 2025 | Friday - Saturday

E-ISBN PROCEEDING VOLUME I



©Royal Institution of Surveyors Malaysia

Published by
Royal Institution of Surveyors Malaysia
3rd Floor, Bangunan Juurukur
64 & 66, Jalan 52/4
46200 Petaling Jaya
Selangor

E- PROCEEDING 17th RISM ISCU 2025 Volume 1

Editors: Lizawati Abdullah, Nor Suzila Lop, Nor Nazihah Chuweni, Suriani Ngah Abdul Wahab,
Hasnan Hashim

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eISBN 978-629-94789-0-4



(online)

WELCOME SPEECH FROM THE CHAIRMAN

RISM 17th International Surveying Conference for Undergraduates (ISCU 2025)

بسم الله الرحمن الرحيم السلام

عليكم ورحمة الله وبركاته

Greetings to all,

It is with great pleasure that I welcome you to the 17th RISM International Surveying Conference for Undergraduates (ISCU 2025), themed “*Embracing Construction Revolution 4.0: Transforming Malaysia’s Built Environment.*” On behalf of the Royal Institution of Surveyors Malaysia (RISM), I also wish to express our sincere appreciation to Universiti Teknologi MARA (UiTM), Perak Campus, for graciously hosting this significant event.

As we navigate the era of the Fourth Industrial Revolution (IR4.0)—or in our context, Construction Revolution 4.0 (CR4.0)—we are witnessing transformative advancements across the global construction sector. Technologies such as Building Information Modelling (BIM), the Internet of Things (IoT), artificial intelligence (AI), robotics, big data analytics, and cloud computing are redefining the way we build, manage, and interact with our built environment. For Malaysia, embracing CR4.0 is a strategic imperative to achieve our socio-economic and environmental goals.

This conference serves as a vital platform to unite surveying undergraduates from various disciplines, fostering critical dialogue on industry challenges, enhancing professional networking, and preparing a new generation of talent for the rapidly evolving construction landscape. It is also an opportunity for employers to engage with and inspire our future professionals.

I would like to extend my heartfelt thanks to all industry speakers, paper presenters, judges, and participants for their time, contributions, and support in making ISCU 2025 a success. I also commend the organising committee for curating a meaningful and dynamic conference experience.

May the knowledge gained, connections formed, and ideas exchanged during this event inspire all participants to lead and innovate in their future endeavours.

Wishing everyone a productive and memorable conference.

Prof. Ts Sr Dr. Adi Irfan Bin Che Ani'

Chairman, Universities' Partnering Committee

RISM Session 2024/2025

May 2025

WELCOME SPEECH FROM CO-CHAIRMAN

RISM 17th International Surveying Conference for Undergraduates (ISCU 2025)

Bismillahirrahmanirrahim.

السلام عليكم ورحمة الله وبركاته and greetings to all.

It is my great pleasure to welcome everyone to the 17th International Surveyor Conference for Undergraduates (ISCU 2025), proudly hosted by Universiti Teknologi MARA (UiTM) Perak Branch in collaboration with the Royal Institution of Surveyors Malaysia (RISM). This event is a meaningful platform for students in the built environment to share ideas, showcase innovations, and build professional networks. We are honoured by your presence and enthusiastic participation, with 135 accepted papers and 78 poster presentations this year.

UiTM Perak, home to the College of Built Environment, has long been a hub for academic excellence in architecture, planning, and surveying. Our commitment remains strong in nurturing competent graduates who meet industry demands and contribute to nation-building.

While you're here, we invite you to experience the heritage and culture of Perak Tengah from the architectural richness of Rumah Kutai to the historical towns of Pasir Salak, Bota, and Kampung Gajah.

To all presenters and winners, congratulations on your achievements. Let your work today be a catalyst for future success and academic growth. We hope this conference will inspire you to explore new ideas, foster collaboration, and make lasting memories.

My deepest thanks to the Royal Institution of Surveyors Malaysia (RISM) and the organising committee for making this event a success.

We hope your experience here will be rewarding and unforgettable.

Thank you. Selamat datang dan selamat berjaya.

Associates Professor Dr. Nur Hisham Ibrahim, *PMP*

Co-Chairman, Universities' Partnering Committee

RISM Session 2024/2025

May 2025

WELCOME SPEECH FROM THE PROJECT DIRECTOR

RISM 17th International Surveying Conference for Undergraduates 2025

Alhamdulillah, all praise to Allah S.W.T. for His guidance and blessings in making the RISM 17th International Surveying Conference for Undergraduates (ISCU) 2025 a reality.

It is with great honour and gratitude that I welcome all participants, guests, academicians, and industry professionals to this prestigious event, proudly organized under the Royal Institution of Surveyors Malaysia (RISM). This 17th edition of ISCU stands as a proud testament to our collective dedication toward academic excellence, professional collaboration, and youth empowerment in the field of surveying.

I extend my heartfelt appreciation to RISM for its unwavering support, to the hardworking ISCU 2025 Organising Committee, and to all 16 partnering universities across Malaysia for their commitment and contributions. Your efforts have shaped this conference into a dynamic platform for knowledge exchange, innovation, and professional growth.

To the academicians and practitioners present, your insights are invaluable in bridging the gap between academic theory and real-world practice. To our undergraduate participants, your passion, curiosity, and commitment are the very foundation of our future. May this conference not only deepen your academic journey but also ignite a spirit of leadership, integrity, and sustainable thinking.

Let this gathering serve as more than an academic milestone. May it foster lifelong networks, inspire transformative ideas, and chart new directions in our shared professional journey.

Wishing everyone a rewarding and inspiring conference experience.

Sr Dr. Nurul Fadzila Zahari

Project Director

RISM 17th ISCU 2025

EXPLORING THE CHALLENGES TO QUALITY MANAGEMENT SYSTEM IMPLEMENTATION IN MALAYSIAN RESIDENTIAL PROJECTS

Nur Syahmina Sepiyan¹, Izatul Farrita Mohd Kamar^{2*}

^{1,2*} Program of Quantity Surveying,
Department of Built Environment Studies and Technology, Faculty of Built Environment,
Universiti Teknologi MARA (UiTM) Perak Branch, MALAYSIA.

Email: ^{2*}izatul739@uitm.edu.my

*Corresponding Author

ABSTRACT

Quality is known to be essential to the success of the construction projects to ensure the successful delivery and building performance. The ISO 9001 Quality Management System (QMS) is one of the standards that acts as an indicator in establishing a high-quality construction project. QMS also can be defined as a structured system that consistently maintains and improves the quality and performance of the construction project. However, quality issues still become critical issues in the construction industry, mainly in residential projects; yet research in this area remains inadequate. Moreover, there is a shortage of relevant studies focusing on challenges hindering the successful adoption of QMS in the construction industry despite the significance of QMS. Hence, this study aims to explore the key challenges faced among Malaysian construction companies that hinder them from effectively implementing QMS in construction. This study employs a quantitative research approach by using a questionnaire survey of Contractor G7 in Selangor that involves residential projects. The findings indicate that the key challenges to effective QMS implementation include resistance to change, lack of knowledge, an implementation process that is not straightforward, and lack of communication. Therefore, by addressing these challenges, this study contributes to highlighting the valuable findings to bridge the existing research gap and contribute to the successful implementation of QMS to improve performance and quality in the building sector. By effectively adopting QMS, construction companies are also able to enhance their overall performance and lay a strong foundation for sustainable development initiatives.

Keywords: Challenges, Quality Management System, Residential Projects

I. INTRODUCTION

In engineering, manufacturing, and industry, quality is defined as something that is neither inferior nor superior and that is also recognised appropriate for its intended use (fit for purpose) while satisfying customer expectations (Patel & Pitroda, 2021). However, the construction industry presents a number of obstacles, attitudes, approaches, methods, and challenges that must be addressed when implementing Quality Management System (QMS) as stated from study by Ross (2021). Mohammad et al. (2019), also pointed out that quality has grown to be a major concern in the construction industry's development. Besides, Mohammed Abdelalim et al. (2021), emphasized that QM is essential to business management to enhance organizational performance and raise the caliber of services and goods. Hence, based on Khalfan et al. (2020), a strong quality culture is recognized as a crucial requirement for gaining a sustained competitive edge in order to deliver goods or services that satisfy customer needs. Therefore, this shows that the crucial of QMS implementation for effective quality management, risk reduction, and project success to enhance the quality of construction project.

Besides, the main factors contributing to the low quality of buildings during construction were poor craftsmanship, non-compliance with requirements/standards, inadequate site management, failure to achieve high-quality standards, and poor-quality materials/components (Olanrewaju & Lee, 2022). This is also supported by Khalfan et al. (2020), several factors were under stress for better quality culture in building that because of immense criticisms that have been piled on the construction companies for the commonly quality-related issues such as workmanship or project. Hence, ways to overcome the quality issues, Mohammad et al. (2019), stated that quality management system (QMS) can be defined in terms of quality assurance, quality control, and quality planning in order to ensure that construction projects will be completed successfully and without any problems, for the highest quality, explicit amount, and at the lowest possible value.

According to Ross (2021) QMS in the construction industry mainly refers to quality planning, quality assurance, and quality control with the aim of completing the project within budget, to the desired quality, safely and on time. This is to ensure that the finished product is delivered on schedule, within budget, and in accordance with standards. Besides, the study from Othman et al., (2020) pointed out that the Construction Industrial Development Board (CIDB) imposed that all Grade G7 contractors obtain ISO 9000 Quality Management System certification on January 1st, 2009. Therefore, as a result, developing nations' construction industries need to develop a strategic and structural framework that takes quality standards, quality assurance, and quality control into account to compete with their rivals in developed nations (Riaz et al., 2023). Hence, construction companies in developing nations can compete with more established industries in developed countries by incorporating these components into their operations, which will enhance project outcomes, reduce defects, and provide better value.

Hence, quality management systems are essential frameworks that guarantee quality and consistency in the completion of projects, especially in the construction sector where mistakes can have serious repercussions. Ali Shaikh & Sohu, (2020) also emphasized that in addition to improving performance and quality, the ISO 9001 quality management system also reduces construction project costs and duration. Related to study from Sin et al. (2024), end users and project stakeholders are still impacted by the notable prevalence of subpar facilities and final products, including early defects, repairs and reworks, and general product failures in construction projects. Mohammed Abdelalim et al. (2021), also emphasized that it is challenging to adopt QMS it is still unclear how the QMS requirements relate to construction projects.

Khalfan et al. (2020), stated that the need for research is due to the insufficiency of studies in the construction industry and the rise in quality concerns as the main source of concern for building enterprises. Despite CIDB's efforts to encourage all Grade 7 Malaysian contractors to obtain ISO certification, there remain issues and concerns to address where the construction industry is also grappling with how to incorporate quality Management System (QMS) (Rashid Bin & Ghani, 2021a). Moreover, study from Rahimin et al., (2024) pointed out that construction defects are a persistent issue in Malaysian residential projects, threatening the growing construction sector despite the nation's rapid development. Hence, this shows that quality issues still become critical issues in the Malaysian construction industry mainly in residential projects yet research in this area remains inadequate. Hence, the objective of this paper is to explore the challenges to quality management system implementation in Malaysian residential projects

II. LITERATURE REVIEW

F. Challenges in Implementing QMS in Construction Industry

Process of Implementation Not Straightforward

The process of implementing an ISO 9001:2015 QMS is not straightforward because of to the many challenges that must be overcome (Rashid Bin & Ghani, 2021). Even if the contractor is expected to implement a quality management system, the quality of a construction project would not automatically improve (Rashid Bin & Ghani, 2021). This is because, the construction industry faces unique challenges due to the complexity of projects, involvement of multiple stakeholders, and the need to adhere to regulatory requirements (Egbebi Adeleke Oluwatosin, 2024). The same study also stated that even though ISO certification offers numerous benefits, an organization might not be able to utilize them all. Besides, Mohammad et al., (2019) stated the same issue where the study mentioned this issue is brought up in a variety of studies on the quality management system, which clearly makes it clear that implementing an effective quality program is not an easy task. Therefore, previous study shows that process of QMS is not an easy task as it is not straightforward and become one the barriers that hindering the successful adoption of QMS among construction companies.

Nature of Construction Sector

Reinaldo et al., (2020) stated that the construction sector has dynamic processes that may vary based on the project being developed. Besides, particularly when it comes to the dynamics of the construction process, construction project is a complex as there is frequent changes during construction period. Moreover, according to the study from Egbebi Adeleke Oluwatosin, (2024) the challenges to implement effective QMS is due to the dynamic nature of construction projects, which often involve changes in design and scope, poses challenges to maintaining consistent quality standards throughout project execution. Besides, Odubiyi et al., (2019) pointed out that other studies have attributes problems arising from cost, time and quality, specification for construction projects, and complexity of construction processes as barriers to implementing QMS for industry 4.0. Supported by the study from Stanojeska et al., (2020) The most significant ones include the complexity of the QMS implementation process and its time-consuming nature because of the many influencing factors.

Resistance to Change

According to Rashid Bin & Ghani, (2021) although many Malaysian construction companies are aware of the ISO 9001 quality management system, many still have not put it into practice. Based on study from Ahmed, (2020) reluctance of staff to change is one of the serious barriers facing successful deployment of QMS in the construction industry wherein these employees need to quickly adapt to the continual changes associated with QMS maintenance and improvement. The same study mentioned that the resistance is attributed by related staff to considering any change to QMS requirements as threatening in terms of creating uncertainty and displaces that required new knowledge and skills. This also supported by the study from Egbebi Adeleke Oluwatosin, (2024) mentioned that challenges such as resource constraints and resistance to change were identified as barriers to effective quality management. Moreover, such change or improvement probably requires additional works in respect to necessary training and documentation as well as required time to cope with these changes where a workforce suffers from a tight timeline(Ahmed, 2020).

Therefore, staff resistance to change could result from a lack of motivation brought on by doubts about the advantages of the new knowledge and skills as well as a reluctance to adopt new procedures, knowledge, and information. This also supported by study from Alawag et al., (2023) stated that the challenges to implement QMS is issues that include resistance to change and a lack of knowledge and comprehension of TQM in the sector. Besides, this challenges also issued by the study from Mohammad et al., (2019) where many establishments are hesitant to adopt QMS because they are unsure if the benefits will outweigh the associated costs. Yang et al., (2024) also highlighted many respondents agreed that top management in these companies is often reluctant to make changes and prefers to keep things the way they are. Therefore, it can be sum up that the sector's adoption of QMS is seriously hampered by this reluctance, which is driven by perceived risks and a fear of disruptions. Together, these results highlighted the resistance to change is from top management and among the staff where they to take a proactive stance in order to overcome resistance to change. This includes funding employee training, raising awareness, and coordinating QMS initiatives with organizational goals.

Lack of Knowledge

Certain significant factors experienced during QMS implementation are the staff's inability to follow QMS and poor technological know-how.Patel & Pitroda, (2021). This also supported by Yang et al., (2024) mentioned that studies have identified obstacles to ISO 9001 adoption, including misinterpretations of the standard's intent and disseminating failures that are directly related to management teams' inexperience. This is because, some companies have encountered considerable obstacles during planning and implementing QMS, and these problems are mainly due to lack of experience and knowledge in the company and in the industry (Ahmed, 2020). This shows that various studies agreed that lack of knowledge is one of the barriers that hindering construction companies to effectively implement QMS. Besides, as part of the framework, QMS requires a Project Quality Plan (PQP) at the project stage. Due to the market players continued poor understanding of PQP, there are multiple issues with its implementation as mentioned by Patel & Pitroda (2021). The same study also stated that the biggest problem is that employees lack sufficient knowledge about the system. Therefore, this shows that lack of knowledge among the industry players regarding the aspects of QMS that lead to the challenges to effectively implement QMS in construction project.

According to the study from Mohammad et al., (2019), it is challenging to interpret the quality and requirements of the quality system. The author stated that a thorough comprehension of the ISO standards' philosophies and ways of thinking is necessary to convert the standards into the proper course of action. Hence, to identify the stated commonplace of quality would be difficult if it were not fully understood. The most significant ones include the different knowledge regarding phases of the QMS's development and the characteristics that go along with it (Stanojeska et al., 2020). Other than that, study from Alawag et al., (2023) also pointed out the challenges to implement QMS is issues that include resistance to change and a lack of knowledge and comprehension of TQM in the sector. Besides, Rashid Bin & Ghani, (2021) mentioned that the current issues with QMS implementation, such as a lack of knowledge about the ISO 9001:2015 quality standard, make it too hard to implement. Example like staff members' incapacity to adhere to the QMS and their lack of technological expertise are significant challenges encountered during QMS implementation (Patel & Pitroda, 2021). According to Mohammad et al., (2019), the main issues for combating are as follows: modification is a danger as it causes doubt and moves one from a foothold of the rest, as one's information and ability are no longer sufficient. Therefore, based on the previous studies, it shown that lack of knowledge contributes to the barriers for effectively implement QMS among construction companies.

Lack of Communication

Lack of communication is one of the problems that becomes a barrier while adopting a quality management system (Mohammad et al., 2019). The same study stated that lack of communication both internally and externally hinders the implementation of a quality system. Lack of communication can take many forms, such as insufficient

information exchange, ambiguous instructions, and fragmented stakeholder participation. Externally, miscommunication can result in delays, poor quality, and misunderstandings when dealing with suppliers, clients, and regulatory agencies. This also supported by Ahmed (2020) mentioned that an effective deployment of a QMS requires an efficient internal and external communication, which is clearly an obstacle to the adoption of a QMS due to poor communication. At the same time, according to Yaman et al., (2022), communication is crucial because there are tasks to be completed at each stage of the building project life cycle that call for the engagement of various resources. However, inadequate QMS implementation results in insufficient maintenance of ISO 9001 certification due to poor communication and ineffective continuous learning as mentioned by Rashid Bin & Ghani, (2021).

This also supported by study from Egbebi Adeleke Oluwatosin, (2024) the challenges to implement QMS include fragmented communication between stakeholders. Besides, project managers' communication skills are crucial to a project's success since it permeates every step of the project process, effective communication is also critical to project planning and execution (Galli, 2022). Additionally, the main barriers to the successful implementation of QMSs after certification are apparently staff members' not enough knowledge of QMS requirements and ineffective responsibility and authority definition. These obstacles are essentially the same as those that prevent an ISO 9001 QMS from being implemented in practice both before and after certification (Ahmed, 2020) Therefore, it can be summarized that project planning, execution, and maintaining ISO 9001 certification are all limited by insufficient information exchange, unclear instructions, misinterpretation due to poor communication and fragmented stakeholder participation, all of which result from ineffective internal and external communication when implementing Quality Management Systems (QMS).

Lack of Awareness

According to Rashid Bin & Ghani, (2021) "Lack of Awareness of Company Directions and Operational Plans" is one of the primary issues that organizations in the Malaysian construction industry face when implementing ISO 9001 QMS. At the same time, this issue supported by other study which from Ahmed, (2020) that QMSs in the construction industry are still considered as cost prohibitive by many construction companies due to the lack of awareness about their potential importance (and benefits). This issue also stated by Rashid Bin & Ghani, (2021) where management is reluctance to commit time and expenditures to train the employees. This shows that the awareness among management is become the issues as the barriers to implement effective QMS implementation in construction organizations. Moreover, (Ahmed, 2020) also agreed that lack of awareness and knowledge have been asserted as major obstacles to implementing a QMS in the construction industry

Lack of Management

Lack of management commitment is considered one of the main issues confronting the implementation of a QMS in the construction industry (Ahmed, 2020). The same study mentioned that the issue of management commitment is associated with the lack of perceiving QMS adoption benefits, in which quality is not placed as the priority against time and cost by many top managements of construction organisations. Mohammad et al., (2019) also highlighted the same issue where that many companies 'prime management do not place quality because of the priority versus the issue of time and price. Besides, challenges persist in implementing effective quality management practices across construction projects include inadequate stakeholder engagement, inconsistent regulatory frameworks, and fragmented communication among project teams can undermine quality outcomes (Egbebi Adeleke Oluwatosin, 2024). Therefore, it shows that inadequate stakeholders engagement becomes one of the barriers to QMS implementation. This also supported by study from Mohammad et al., (2019) mentioned management's unwillingness to invest time and money in staff training. Together, he stated that some organizations believed that QMS was only about recording their quality system and ignored the significance of training the employees.

Poor Quality Culture

According to (Khalfan et al., 2020) a quality culture ensures that all employees are committed to producing high-quality work and strive for zero defects and distinction in their work. However, unethical behaviour can occur during various stages of a building project, including planning, execution, and handover. Besides, poor-quality culture has been caused by poor management perceptions in organizations, poor working conditions for construction workers, and pressures related to schedule and safety (Luo et al., 2022). Moreover, study from Khalfan et al., (2020) added that complications in preserving a quality culture in construction industries is expected issues by many difficulties that hindered them from succeeding the quality standards. For example, an attitude can lead to projects being deemed unsuitable, unnecessary, overly complex, or overly expensive after completion or delay in the project.

Ross, (2021) stated that the value of communication in creating a high-quality culture and concluded that companies with high-quality cultures consistently have effective communication within and between groups. Even

if the contractor is expected to implement a quality management system, the quality of a construction project would not automatically improve. This is due to the fact that the contractor's attitude toward quality management is a vital factor in the system's performance (Rashid Bin & Ghani, 2021). This shows that organizations may find it difficult to maintain high performance without a strong quality culture, which could lead to inconsistent quality outputs and possible failures to meet internal and external quality standards. Other than that, Ross (2021) additionally explained the reasons why instilling a quality culture in the construction industry is because the complex nature of how it operates. It is made up of a multitude of professions, occupations, and organisations, which are involved in different phases of the project, and can include: development, feasibility, finance, development of concept and review, detailed engineering, estimating, procurement, start-up and construction. Additionally, they point to education and training as being crucial to the development of a quality culture, stating that workers should receive training as soon as possible to enable them to contribute effectively to the company.

Resource constraint

The resource constraint that discussed in the previous studies is include the financial issue, shortage of time and shortage of skilled staff. Ahmed, (2020) mentioned that the cost and duration of deploying a QMS are the most significant obstacles that prevent construction companies from implementing a QMS. He added that this cost makes construction organisations hesitant to implement a QMS, especially because the benefits of adopting such systems are still uncertain for these organisations. Besides, Egbebi Adeleke Oluwatosin, (2024) also highlighted the same issue that challenges such as resource constraints and resistance to change were identified as barriers to effective quality management. Other than that, insufficient time is considered as a hindrance to the effective adoption of QMS in construction, this issue is probably associated with poor planning performed at the early stage of a project, resulting in company failure to meet the proposed deadline (Ahmed, 2020).

Besides, Patel & Pitroda, (2021) mentioned certain significant factors experienced during QMS implementation are the staff's inability to follow QMS and poor technological know-how. This shows lack of understanding on how to fully utilize the technology for QMS implementation among the staff in construction companies. Mohammad et al., (2019) also mentioned that high implementation and maintenance cost for a system of high quality requires a high value for application. Furthermore, the same study stated that several establishments are hesitant to adopt QMS due to price concerns, as they are unsure if the benefits will outweigh the costs. The use of QMS in construction is also hindered by issues with large investments, unclear construction specifications, and inadequate QMS implementation. 4.0 (Odubiyi et al., 2019). Therefore, it shows that cost constraint becomes one of the key barriers that include in resource allocation that hinder the contractor to implement QMS in construction industry.

QMS Application Requires More Work

Mohammad et al., (2019) expressed that the ISO 9001 application suggests that additional documentation work should be handled throughout the application phase. He further stated that cognitive content or the shortage of an obvious understanding of the basic requirements of the documentation is the main reasons of the creation of a large amount of hard-to-use work. Besides, Ahmed, (2020) also pointed out that required paperwork and documentation is a serious barrier to QMS implementation in construction since effective QMS implementation involves coping with a huge amount of documentation work throughout the deployment of a system, lack of clear perception or ignorance of the essentials of documentation requirements causes a considerable amount of extra paperwork that is difficult to use or control.

Hence, this related to the insufficient training for project teams, which is essential to giving staff the necessary perception and familiarization with QMS requirements, can also lead to a lack of a sufficient level of qualification as pointed from Ahmed (2020). Meanwhile, there is also the need for regular inspection of construction work and regular inspection of quality by team that are identified as most five factors which barriers the implementation of ISO 9001 in construction industry of Pakistan (Ali Shaikh & Sohu, 2020). Furthermore, learning new information and skills has become mandatory in cases where the application process requires extra work, such as documentation and employee coaching (Mohammad et al., 2019). This shows that construction companies faced challenges which is it requires more work to implement QMS such as additional documentation work, lack of staff training, and regular inspection works as they are sceptical that the costs involved might not be greater than the advantages of the change leads to the barriers of QMS implementation.

Table 1.0 The Table of Challenges in Implement QMS in Construction Industry

No	Variables	Authors	Frequency
1	Process of Implementation Not Straightforward	Rashid Bin & Ghani, (2021), Egbebi Adeleke Oluwatosin (2024), Mohammad et al., (2019)	3
2	Nature of Construction Sector	Reinaldo et al., (2020), Egbebi Adeleke Oluwatosin, (2024), Odubiyi et al., (2019), Stanojeska et al., (2020)	4

3	Resistance to Change	Rashid Bin & Ghani, (2021), Ahmed, (2020), Egbebi Adeleke Oluwatosin, (2024), Alawag et al., (2023), Yang et al., (2024). Mohammad et al., (2019)	6
4	Lack of Knowledge	Patel & Pitroda, (2021), Yang et al., (2024), Ahmed, (2020), Mohammad et al., (2019), Stanojeska et al., (2020), Rashid Bin & Ghani, (2021), Alawag et al., (2023)	7
5	Lack of Communication	Mohammad et al., (2019), Ahmed, (2020), Yaman et al., (2022), Rashid Bin & Ghani, (2021), Galli, (2022), Egbebi Adeleke Oluwatosin (2024),	6
6	Lack of Awareness	Rashid Bin & Ghani, (2021), Ahmed, (2020)	2
7	Lack of Management	Ahmed (2020), Mohammad et al., (2019), Egbebi Adeleke Oluwatosin (2024)	4
8	Poor Quality Culture	Khalfan et al., (2020), Luo et al., (2022), Ross, (2021), Rashid Bin & Ghani, (2021)	5
9	Resource Constraint	Ahmed, (2020), Egbebi Adeleke Oluwatosin, (2024) Patel & Pitroda, (2021) Mohammad et al., (2019), Odubiyi et al., (2019).	5
10	QMS Application Requires More Work	Mohammad et al., (2019), Ahmed, (2020), Ali Shaikh & Sohu, (2020).	3

III. METHODOLOGY

The study employs a quantitative methodology, gathering data through a questionnaire. The questionnaire is divided into four (4) sections: section A asks demographic information; section B discusses the benefits of implementing quality management systems in Malaysian residential projects; section C explores the challenges in implementing quality management systems in Malaysian residential projects; and section D consist of a set of questions on the solutions for improving quality management in Malaysian residential projects. Respondents will choose Five (5) point Likert scales ranging from strongly disagree (scale 1) to strongly agree (scale 5). The scope of the research will be focused on the challenges of implementing quality management practices in Malaysian residential projects. This study will be conducted in the Selangor area, focusing on residential projects. This is because the development in Selangor is currently experiencing and undergoing a significant increase in the number of construction projects. Meanwhile, the research for quality management focusing on Selangor state is not sufficiently done. The distribution of research participants will be restricted to G7 contractors as they are the ones required by CIDB to adopt the ISO 9001:2015 quality management system. The target respondents for this study consist of project managers, construction managers, quality assurance/control officers, site engineers, and quantity surveyors.

IV. FINDINGS

Table 2.0 below presents the results from the reviewed article. As the questionnaire survey is not distributed yet, the findings from the study are based on the selected articles. Key themes (challenges) which are relevant to the aim of this study were also retrieved from the selected study.

Table 2.0 Summary of Finding from Study Reviewed

Authors	Variables	Methodology
Ahmed (2020)	Resistance to change, Lack of Knowledge, Lack of Communication, Lack of Awareness, Lack of management, Resource Constraint, QMS application requires more work	Qualitative (Literature Review)
Alawag et al., (2023)	Resistance to change, Lack of Knowledge	Qualitative (Semi-Structured Interview)
Ali Shaikh & Sohu, (2020)	QMS Application Requires More Work	Quantitative (Questionnaire Survey)
Egbebi Adeleke Oluwatosin, (2024)	Nature Of Construction Sector, Resistance to Change, Lack of Communication, Lack of management, Resource Constraint	Qualitative (Semi-Structured Interview)
Galli, (2022)	Lack of Communication	Qualitative (Literature Review)
Khalfan et al., (2020)	Poor Quality Culture	Qualitative (Literature Review)
Luo et al., (2022)	Poor Quality Culture	Quantitative (Questionnaire Survey)

Mohammad et al., (2019)	Resistance to change, Lack of Knowledge, Lack of Communication, Lack of management, Resource Constraint, QMS application requires more work	Qualitative (Case Study)
Odubiyi et al., (2019)	Nature Of Construction Sector, Resource Constraint	Qualitative (Literature Review)
Patel & Pitroda, (2021)	Lack of Knowledge, Resource Constraint	Qualitative (Literature Review)
Rashid Bin & Ghani, (2021)	Resistance to change, Lack of Knowledge, Lack of Communication, Lack of Awareness, Poor Quality Culture	Quantitative (Questionnaire Survey)
Reinaldo et al., (2020)	Nature Of Construction Sector	Qualitative (Semi-Structured Interview)
Ross (2021)	Poor Quality Culture	Quantitative (Questionnaire Survey)
Stanojeska et al., (2020)	Nature Of Construction Sector, Lack of Knowledge	Qualitative (Literature Review)
Yaman et al., (2022)	Lack of Communication	Quantitative (Questionnaire Survey)
Yang et al., (2024)	Lack of Knowledge	Quantitative (Questionnaire Survey)

CONCLUSION

Adoption of the ISO 9001 Quality Management system is necessary in the construction industry, especially for achieving the high quality of end products in construction. Therefore, effective implementation of a Quality Management System in construction, especially in residential projects, is able to ensure the high quality of the project delivery as well as enhance the building performance. Furthermore, the study on the key challenges of QMS in the construction industry is important as there is still a lack of research and studies focused on the residential projects. It is crucial to address these challenges to improve the construction quality and enhance the overall project efficiency that relates to time, cost, and quality. As a result of this study, lack of knowledge, lack of communication, and resistance to change are identified as the major challenges that occur in the construction companies that hinder the successful implementation of QMS. Hence, by addressing these challenges, key players in the construction industry are not only able to enhance the quality of the project but also strengthen the project performance and outcomes to support the goals of construction excellence and sustainability, especially in residential projects in Malaysia.

ACKNOWLEDGEMENT

The author gratefully acknowledges the College of Built Environment, Department of Built Environment Studies and Technology, UiTM Perak Branch. Special gratitude, especially to the supervisor, for the valuable input in enhancing the quality of this study.

REFERENCES

- Ahmed, M. A. (2020). An exploration of factors Influencing quality management system (QMS) implementation: The case of the Australian Construction Industry BSc (Civil), MSc (construction/project management).
- Alawag, A. M., Alaloul, W. S., Liew, M. S., Baarimah, A. O., Musarat, M. A., & Al-Mekhlafi, A. B. A. (2023). The role of the Total-Quality-Management (TQM) drivers in overcoming the challenges of implementing TQM in Industrialized-Building-System (IBS) projects in Malaysia: Experts' perspectives. *Sustainability (Switzerland)*, 15(8). <https://doi.org/10.3390/su15086607>
- Ali Shaikh, F., & Sohu, S. (2020). Implementation, advantages and management of ISO 9001 in the construction industry. *Civil Engineering Journal (Iran)*, 6(6), 1136–1142. <https://doi.org/10.28991/cej-2020-03091535>
- Egbebi Adeleke Oluwatosin. (2024). Quality management in construction projects. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 30–30. <https://doi.org/10.55248/gengpi.5.0724.1615>
- Galli, B. J. (2022). The role of communication in project planning and executing. *International Journal of Applied Management Sciences and Engineering*, 9(1), 1–20. <https://doi.org/10.4018/ijamse.302902>
- Khalfan, I., Jamaluddin, Z., & Widyarto, S. (2020). The effect of quality culture on quality management practices and projects performance for construction companies-conceptual framework. www.solidstatetechnology.us

- Luo, H., Lin, L., Chen, K., Antwi-Afari, M. F., & Chen, L. (2022). Digital technology for quality management in construction: A review and future research directions. In *Developments in the Built Environment* (Vol. 12). Elsevier Ltd. <https://doi.org/10.1016/j.dibe.2022.100087>
- Mohammad, M. Z., Viana, M., & Raghib, A. T. (2019). Benefits and implications of the different types of quality management in the Malaysian construction industry. *IOP Conference Series: Materials Science and Engineering*, 650(1). <https://doi.org/10.1088/1757-899X/650/1/012008>
- Mohammed Abdelalim, A., Ahmed Eldesouky, M., Author, C., & Ahmed Eldesouky, M. (2021). Evaluating contracting companies according to quality management system requirements in construction projects. www.ijemh.com
- Odubiyi, T. B., Oke, A. E., Aigbavboa, C., Thwala, W. D., Oke, A., & Thwala, W. (2019). Barriers to implementing quality management system in the industry 4.0 era. <https://www.researchgate.net/publication/335700804>
- Olanrewaju, A. L., & Lee, A. H. J. (2022). Investigation of the poor-quality practices on building construction sites in Malaysia. *Organization, Technology and Management in Construction*, 14(1), 2583–2600. <https://doi.org/10.2478/otmcj-2022-0008>
- Othman, I., Norfarahhanim Mohd Ghani, S., & Woon Choon, S. (2020). The Total Quality Management (TQM) journey of Malaysian building contractors. *Ain Shams Engineering Journal*, 11(3), 697–704. <https://doi.org/10.1016/j.asej.2019.11.002>
- Patel, C. S., & Pitroda, J. R. (2021). Quality management system in construction: A review. In *Chirag Patel QUALITY MANAGEMENT SYSTEM RT&A, Special Issue №* (Vol. 1, Issue 60).
- Rahimin, N., Mohd Isa, H., Mohd, T., & Ahmad, N. A. (2024). Tracking architectural defects in residential project in Malaysia. *Malaysian Journal of Sustainable Environment*, 11(1), 229–250. <https://doi.org/10.24191/myse.v11i1.997>
- Rashid Bin, M., & Ghani, A. (2021). Challenges of ISO 9001:2015 quality management system implementation in Malaysian construction companies.
- Reinaldo, L. da S. P., Vieira Neto, J., Goyannes Gusmão Caiado, R., & Gonçalves Quelhas, O. L. (2020). Critical factors for total quality management implementation in the Brazilian construction industry. *TQM Journal*, 33(5), 1001–1019. <https://doi.org/10.1108/TQM-05-2020-0108>
- Riaz, H., Iqbal Ahmad Khan, K., Ullah, F., Bilal Tahir, M., Alqurashi, M., & Alsulami, B. T. (2023). Key factors for implementation of total quality management in construction Sector: A system dynamics approach. *Ain Shams Engineering Journal*, 14(3). <https://doi.org/10.1016/j.asej.2022.101903>
- Ross, D. (2021). The challenges of implementing a quality management system in contemporary large scale construction projects. <https://doi.org/10.13140/RG.2.2.28094.97601>
- Stanojeska, M., Minovski, R., & Jovanoski, B. (2020). Top management role in improving the state of QMS under the influence of employee's involvement: Best practice from the food processing industry. *Journal of Industrial Engineering and Management*, 13(1), 93–119. <https://doi.org/10.3926/jiem.3031>
- Yaman, S. K., Hassan, P., Yusop, N. M., Hashim, N. E. zzati, Mohammad, H., & Bakar, H. A. (2022). Factors affecting quality in construction project life cycle (CPLC). *International Journal of Integrated Engineering*, 14(1), 322–335. <https://doi.org/10.30880/ijie.2022.14.01.030>
- Yang, L. Y., Abas, H., Hasanah, N., & Ta'at, M. (2024). Examining the implementation of ISO 9001 among Malaysian construction companies. *International Journal of Business and Technology Management*, 6(3), 594–601. <https://doi.org/10.55057/ijbtm.2024.6.3.53>



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eISBN 978-629-94789-0-4



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