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Integrating Knowledge Management Processes with Total Quality Management Principles in the Construction Industry: Meta Review, Gap Analysis and Scientometric Analysis

Christina Bukari[1], Nongiba Alkanam Kheni[1], Isaac Boateng[1], Christopher M. Owusu-Ansah[2,3], Perpetua Emma Gyenfie[4]

[1]Department of Construction and Wood Technology, Akenten Appiah-Menka University Skills Training and Entrepreneurial Development, Kumasi, Ghana
[2]Akenten Appiah-Menka University Skills Training and Entrepreneurial Development, Mampong, Ghana
[3]Department of Information Science, University of South Africa, Pretoria, South Africa
[4]Mampong Technical College of Education, Mampong, Ghana
Email: bukarichristina@gmail.com

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Abstract

A crucial component of creating a quality culture is knowledge management (KM), and well-known quality frameworks frequently stress the significance of KM for total quality management (TQM). In effect, KM and TQM are techniques that are closely related to the more general idea of organizational development and performance. The goal of this review is to investigate the relationship between KM and TQM and their impact on construction project delivery. A systematic review of 25 articles from 2001-2022 was conducted. The Key stages in the review include clarification of aims and objectives in the protocol, finding the relevant peer-reviewed journals, collecting data, assessing study quality, synthesizing evidence and interpreting findings. The findings of the study revealed that TQM has a synergistic role in knowledge creation through documents and manuals that specify the principles and action plans of TQM. On the other hand, there are major differences in how TQM and KM are implemented across different industries. In the process of creating knowledge, there was an effective and significant connection between leadership, employee empowerment, customer focus, benchmarking, and information technology. While KM is based on creating a culture that supports knowledge creation and sharing, TQM practices such as strategic planning and human resource management have a positive impact on KM activities like knowledge acquisition, distribution, and application. KM initiatives pursue individual quality in knowledge sharing and creation. Knowledge

acquisition processes can be the subject of quality systems as knowledge dissemination can also be the subject of quality culture. Further, 981 academic documents on the topic were retrieved from Publish or Perish database within the period of 2000-2022. Afterward, co-occurrence and network visualization analysis were carried out to look at the patterns of study interconnections. As a result, relevant key words, network of terms co-occurrences with 73 out of 4506 keywords, 1153 links, and total link strength of 2760 were revealed. The scientometric analysis revealed a strong link between knowledge, total quality management, performance, management process and approach. These keywords attracted more attention in literature during the period.

Keywords

Knowledge Management, Total Quality Management, Integration, Systematic Review, Scientometric Analysis, Keywords

1. Introduction

One of an organization's intellectual assets is knowledge, and the construction sector is no exception. As a project-based industry, the construction sector must manage project knowledge. Effective management of knowledge is essential because it is one of the powerful assets that influence an organization's performance (Sallam et al., 2018). Every project, even those of the same kind, has its specifications and conditions, giving it a certain quality (PMBOK Guide, 2017).

The project involves a variety of disciplines because each project has a separate team from the beginning of planning through completion. It is temporary; therefore after the project is completed, the group either divides up to focus on other projects or stays together to work on a different project (Sallam et al., 2018). Therefore, effective KM is essential to offer market leverage and competitive advantage to project organizations (Rhem, 2017).

The project team members' ability to freely record, maintain, improve, share, and utilize this information is crucial to the ongoing improvement of project performance. It is also expected that the project delivery will meet the objectives of providing clients with a high-quality, cost-competitive project outcome (Jewell & Flanagan, 2019). Knowledge management has been important in ensuring that the information on project delivery and expertise is captured and utilized. This is most effective when built into the day-to-day operations of a project organization, rather than operated as a separate system according to Calnan et al., (2021).

In the PMBOK guide, KM is an enabler of the construction quality system across the entire project lifecycle. Deming (2018), a quality guru wrote in his book, The New Economics for Industry, Government and Education, "Even the best efforts and most diligent work would not result in improvement unless they were guided by knowledge."

Quality management which is one of the knowledge areas includes the

processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements, to meet stakeholders' and clients' expectations (PMBOK Guide, 2017). Preventing errors from occurring is the quality management system's larger goal (Mane & Patil, 2017). Again, quality is crucial because waste and rework are expensive. Lack of quality can have a substantial financial impact and consequently lower profitability (Jewell & Flanagan, 2019). Every level of an organization should be involved in and dedicated to reaching the necessary performance standards by establishing and running procedures and systems that guarantee the outcome for quality to be most successful. Even if the decision is not as clear-cut, quality failure can be costly, risky, and can swiftly undermine the reputation of a project-based organization (Lester, 2017).

Since TQM and KM play very similar roles, it is necessary to consider the impact of proper integration of KM and TQM to ensure effective coordination of the project's various elements. This is necessary because it is difficult to predict the future state of the project in its complex and variable environment (Payal et al., 2019). Employees who were empowered during quality improvement efforts will therefore find it simpler to utilize their knowledge and skills throughout organizational change. As a result, these platforms give employees the chance to share their knowledge across the entire organization (Hung et al., 2010). In essence, KM and QM are instruments that are closely related to one another within the larger framework of organizational development and performance.

The Deming PDCA Cycle (Plan-Do-Check-Act) serves as an example of how KM and TQM are related. The planning stage which is associated with gathering information and producing new information eliminates flaws and improves the cycles. The second stage, implementation (do) emphasizes the requirement and offers a process for problem-solving and improvement, (Check) to look at how it functions and (Act) to fix any issues or enhance performance. To minimize process variation, the PDCA cycle primarily relies on documentation at each stage (Mellat-Parast & Digman, 2008). Both TQM practices and KM processes have a great influence on the organization's strategic competencies and performance (Ju et al., 2006).

Several researchers have utilized the systematic review methodology in construction management studies, construction complexity such as (Asrar-ul-haq & Anwar, 2016; Costa & Monteiro, 2016; Ghaleb et al., 2022). The objective of this paper is to thoroughly conduct a review of KM techniques in relationship with TQM practices while analyzing their effects on the construction project industry. It also aims to identify the gaps in the literature, further analyze the impact of research, and look into citation links to map the knowledge area with trends taken from the publish or perish database.

2. Methodology

The purpose of the study is to review and synthesize the knowledge areas of previous studies about the effects of KM and TQM integration in project delivery.

To fully comprehend the studied topic, the study used the mixed review technique. Using Google Advance Search, searches were conducted for publications published in peer-reviewed journals, books, and book chapters published between January 2000 and December 2022 in English Language which focused specifically on KM and QM using the guidelines of Van Tulder et al. (2003). The following five databases were used: Science Direct, SAGE, Emerald, Taylor and Francis and Google Scholar to ensure a broader scope for a comprehensive analysis. A combination of databases ensures adequate performance in searches recall and precision (Bramer et al., 2017). Searching too few databases may reduce the validity and generalizability of SLR results (Vassar et al., 2017). The search produced nine hundred and eighty (980) papers. After removing 250 duplicates, the remaining papers were 730. The references were ordered alphabetically by author's names in order to avoid bias by publication year and by "relevance". Next, the studies were assessed against the list of research questions: 1) What are the current research's main findings regarding the knowledge management processes integrated with total quality management principles? 2) Which methods were used by the sample papers? 3) What are the knowledge gaps in these papers? 4) What keywords and topics are mostly investigated in the research of KM and TQM in the construction project delivery? After reading abstracts and full texts, the remaining 62 papers were maintained because they reported the results of primary research, and provided data on one or more of the study's variables. Additional 11 papers were retrieved from Google Scholar based on the references from the included studies making the final number to be screened to be included in the review to 73. Upon further screening, 25 studies were used for the analysis. **Table 1** is the Summary of the publication of the Meta-Review Further search was conducted using the publish or perish database and bibliometric analysis was carried out using VOSviewer version 1.6.16 (van Eck & Waltman, 2023).

The capabilities and qualities of each instrument and analytical technique must be taken into consideration while choosing the appropriate tools (Susanti & Reza, 2022). Science mapping was carried out in two stages: The building of networks based on the co-occurrence of terms in the selected publication and generation of maps that extract relevant information such as patterns, trends, evolution, and outliers which yields network visualizations of co-work maps and co-work density maps (van Eck & Waltman, 2023). There were 981 documents in all that were collected from 2000 to 2022 that were published and linked to the topic under study. The analysis on network visualizing the field of construction project on KM and TQM will assist researchers in perceiving the overall research patterns and discovering the research trends. This was done to complement the manual literature review which can produce a comprehensive trend of a particular research area, but remains subjected to bias and limited to subjective interpretation. The article is organized as follows: Meta-Review, discussion of literature, keyword with network parameter, network visualization, overlay visualization, density visualization, conclusion, implication of practice and future direction.

Table 1. A summary of the knowledge management and total quality management meta-review.

Authors/Year	Keyword Co-Occurence	Methodology	Main Findings	Country/Area
Molina et al. (2006)	Quality management practices, knowledge, transfer	Quantitative	Total Quality management has a collection of techniques that have a significant impact on knowledge management, particularly on knowledge transfer.	Spain
Ju et al. (2006)	TQM, Factors, KM	Qualitative (Case study)	One of the management methods for many businesses to ensure long-term competitiveness may be the merger of TQM and KM.	Taiwan, China
Waddell & Stewart (2008)	KM, TQM, bussiness competitve, practices	Quantitative	The QM and KM movements are intertwined because they both aim to give businesses a competitive edge through the adoption of practices that help them better connect with and understand their customers.	Australia
Stewart and Waddell (2008)	Knowledge Management: The fundamental component for delivery of quality	Quantitative	To deliver a quality culture, organizations will need to adopt KM as a vital element.	Australia
Colurcio (2009)	TQM, Knowledge	Qualitative (case study)	TQM is a powerful enabler of knowledge generation. TQM offers guidelines and resources that are intrinsically helpful as catalysts for the production and sharing of knowledge, such as teamwork, general employee participation, feedback methods, and open communication.	Italy
Ch et al. (2009)	Knowledge Management, Total Quality Management, Customer.	Quantitative	Creating and encouraging useful features through the introduction of Knowledge Management processbrings and maintains advantages to meet client needs through appropriateTQM practices.	Germeny
Hung et al. (2010)	Innovation performance, TQM	Quantitative	KM and TQM particularly have a strong relationship especially in the areas of continuous development and employee empowerment. TQM acts as a conduit for KM to enhance innovation performance.	Taiwan, China
Zwain et al. (2011)	TQM, Knowledge Sharing	Quantitative	Information sharing was significantly influenced by TQM core aspects, thus educational institutions must discover ways to make these elements better in order to boost the capacity for knowledge sharing among academic staff.	Iraq
Aboyassin et al. (2011)	TQM, Management, KM Practices	Quantitative	TQM is influenced by KM processes such as diagnosing, acquiring, creating, sharing, storing, and applying.	Jordan

Continued

Loke et al. (2012)	supply chain, knowledge management, total quality management, and approach	Quantitative	TQM places a strong emphasis on quality improvement across all functional domains and organizational levels.	Malaysia
Duran et al. (2014)	Relationship,Total Quality Management, Practices, Knowledge management	Quantitative	In terms of knowledge acquired from customers, employee participation in knowledge sharing, quality process, quality culture, and quality performance, firms with the TQM and ISO 9000 certifications perform better than those without them.	Turkey
Hsu & Shen (2005)	Knowledge Management, Relationship, TQM	Quantitative	Both TQM and KM are; Results oriented People-based management,Teamwork Leadership commitment, Delight the customer and Continuous improvement.	Taiwan, China
Ooi (2014)	TQM, Knowledge Management,	Quantitative	The aspects of TQM like strategic planning and human resource management have a positive influence on KM activities such as knowledge acquisition, distribution, and application.	Malaysia
Soltanpanah & Vaisi (2014)	Relationship, Knowledge Management, Project Quality Management, Construction Industry	Quantitative	Improving "knowledge harvesting," "knowledge documentation," "knowledge transfer," and "knowledge utilization," KM influences project quality management. Key knowledge factors include trust and visionary leadership.	Lisrel
Garstenauer et al. (2015)	Knowledge Management, Approach Total Quality Management	Quantitative	Firms with KM/QM strategies are more successful than a company without one, that implementing a KM/QM strategy will produce higher-quality products	
Yusr et al. (2017)	knowledge management processes, TQM procedures, innovation, strategy	Quantitative	The TQM approach has a favourable and significant impact on knowledge management procedures.	Malaysia
Asrar-ul-haq (2017)	Empirical, investigation TQM practices, knowledge-sharing	Quantitative	information sharing mediates the relationship between TQM procedures and worker performance to some extent.	Pakistan
Rajeshwaran & Aktharsha (2017)	Relationship, Total Quality Management, Knowledge Management, Performance	Questionnaire	Leadership Commitment, Strategic Planning, recognition and reward, employee Involvement, and quality training are the main determinants of KM.	India
Hourani (2017)	Customer focus, teamwork, training	Quantitative	Working as a team allows for the generation and creation of new ideas, which improves the capacity to produce new knowledge. Additionally, the design of training programs enhances employee talents and skills that encourage innovation among the employees to produce new knowledge.	

Continued

Barua et al. (2018)	TQM, Knowledge Creation, Balanced Scorecard, Organizational Performance.	Quantitative	KM facilitate TQM in the organization. Because of the synergistic effect, TQM and KM can enhance organizational performance.	Bangladesh
Barua (2021)	TQM, KM, Knowledge creation, Knowledge conversion mode	Quantitative	The four knowledge conversion processes, the knowledge generation process, benchmarking, employee empowerment, and information technology have a beneficial connection.	Bangladesh

Sources: Authors' own research.

3. Discussion

3.1. Relationship between Knowledge Management and Total Quality Management

Organizations have been interested in the expanding role of KM in organizations and the use of KM procedures (Senaratne et al., 2021). Contrarily, TQM is viewed as a competitive advantage for businesses and organizations in the global market (Deming, 2018). Although studies agreed that TQM and KM are effective tools for organization to boost performance, they did not conceptualize on how to frame this relationship. Additionally, the results had varying contexts for the relationship's nature (Hsu & Shen, 2005; Ribiere & Khorramshahgol, 2004).

Although KM and TQM have been linked to project performance in previous publications, there still seems to be a gap in the body of knowledge regarding their application to construction projects. The majority of studies written over the past 20 years have suggested that important factors like leadership commitment and customer focus could have a considerable impact on how well KM and TQM are implemented. The investigations discovered numerous additional factors that had an impact on the relationship between TQM and KM (Honarpour & Jusoh, 2017; Hung et al., 2010; Zetie, 2002). The purpose of this study is to examine the relationship in this regard, the significant variables and the impact on project performance. By carefully analyzing the research publication in the period of 2002-2005, the emerging trend was comparing the differences and the similarities between KM and TQM. Some variables that involves in their integration include; cultural change, customer-focused and top management support.

Zetie (2002) backed up Deming's theory that, profound knowledge is the foundation of excellence. Using the quality circle tool as a knowledge implementer, the quality of the organization is dependent on the understanding of its processes. The integration of TQM and KM involve cultural change, customer-focused, top management support, necessitate organizational reorganization, and have internal implementation criteria that, if not properly implemented, may result in failure.

Ribiere and Khorramshahgo (2004) researched fusing KM with comprehensive TQM. The outcome demonstrated that TQM and KM are two independent

disciplines but their strengths complement and foster each other. The similarities between TQM and KM, stating that both involve cultural change, TQM introduces a new management style into the project organization, and KM introduces a new way of sharing knowledge and making decisions, and that the success of both heavily relies on the support of top management. The focus of both TQM and KM is on the consumer. Customer Relationship Management (CRM) is the cornerstone of TQM and KM and serves as a foundation. Both have benefit that will become apparent in the future, so senior management in both situations might be hesitant to embrace them. Both need a reliable training programme.

Hsu and Shen (2005) identified similarities as being results-driven, people-based management, teamwork, leadership, and customer happiness. Initiatives in KM strive towards individual excellence in knowledge generation and dissemination. However, certain variations are the results of the various approaches. TQM focuses on fact-based, ongoing improvement, whereas KM emphasizes creating an environment that encourages the creation and exchange of knowledge. Both are similar in many ways, therefore if organized appropriately, they can complement each other. The TQM and KM processes are shown to be strong and complementary. KM process when successfully includes into the project delivery can achieve quality improvement and greater productivity.

The comparison demonstrates that KM process can be incorporated into the TQM principles while engaging with environmental changes in order to attain organizational excellence. Organizations nowadays must contend with crucial challenges of adaptation, survival, and competency. Organizations may address the important issues and gain a competitive advantage through the creation, acquisition, embedding, and use of knowledge. Understanding client demands and requirements is a prerequisite for customer satisfaction. Organizations can differentiate themselves and grow market share for their goods and services by searching out and obtaining new information sources and technologies (Moballeghi & Galyani Moghaddam, 2008).

The limitation of the studies is the failure to properly identify the connections and overlaps between the KM and TQM variables. Though the studies suggested a connection between TQM and KM, they provided little information on how it may be put into practice. They also did not perform any research, like an empirical study, to back it up.

3.2. Quality Culture/Teamwork

There are competing assertions regarding the relationship between TQM and KM, according to a further study of the literature from 2006 to 2010 that examined these relationships. The justifications suggested a beneficial connection and influence between TQM and KM. Additional research supports the internal relationship between KM and TQM in creating a competitive advantage by using qualitative methods. By becoming closer to the consumer, the organization is

better able to comprehend its needs, wants, and motivations. The study shows that a proactive quality culture is a link between KM and QM, both of which have a significant impact on an organization's competitive advantage. Adopting well-designed quality systems within the organization to monitor and structure the way knowledge is created and recorded considerably improves the success of KM procedures. In the industrial sector, effective KM as a discipline will guarantee that the consumer receives products and services of the highest quality. On the other hand lack of significance of TQM teamwork in the organization result in an unexpected project outcome. A deeper study of this relation taking into account the different kinds of teams in TQM and their relation to knowledge transfers is a line of research that would improve understanding of this relationship (Waddell & Stewart, 2008).

According to Ju et al. (2006), the relationship between TQM and KM is beneficial in many ways. An integration of TQM and KM might be one of many management techniques for many firms to ensure a practical application of TQM and KM and to ensure sustainable competitiveness. The essential factors of TQM can serve as practical guidelines for KM implementation. The study which is a qualitative case study investigation highlighted the significance of KM and how manufacturing companies in Taiwan have begun to integrate it into their operational processes. Because the study was restricted to the manufacturing sector and used a qualitative case study approach with only two cases, it might not have adequate details. The results are a proposition because the study was exploratory, therefore they might not have the same impact on another project-based firms.

Colurcio (2009) identified the relationship between the TQM application and concepts of explicit knowledge to be shared within the groups. Once more, TQM plays a synergistic role in knowledge production through the publication of manuals and documents that outline its guiding principles and action plans. It provides a policy to incorporate all employees, teamwork, and feedback systems in addition to evaluating the expertise of specific employees in accordance with businesses that can successfully allocate resources for high performance with the use of strategic planning. This entails developing programs, operational plans, and policies that are aligned with the firm's vision, mission, and goals. The ability to solve problems creatively and make decisions is improved by effective process management and information analysis. All links in the chain will gain from expanding these procedures to team learning behaviour.

Enterprises that had already implemented TQM and had a reputation for excellence in quality issues due to their membership with the European Foundation for Quality Management (EFQM) were the only ones whose cases could be chosen for research. The study amply demonstrated the critical role senior leadership had in creating new organizational knowledge. The sample included twenty (20) significant firms from a variety of industries. Thus, an enabling and open-minded leadership centered on organizational values of trust and sharing

is essential for the development of effective knowledge-creation processes.

Hung et al. (2010) established a stronger link between TQM and the success of KM initiatives and innovation. TQM contains more significant components than KM, such as continuous improvement, despite the fact that KM and TQM share several core concepts. TQM serves as a mediator between performance in KM and innovation. KM activities strongly impacted innovation performance in this study; however, unless TQM acted as a mediator, their impact was minimal. Simply said, KM activities in businesses do not seem to produce or provide value immediately. Superior performance is not produced by KM alone. Instead, in order for an organization to be effective, it must put what it has learnt to use in the right way, such as through overall QM procedures. Organizations may decide to invest in the direct mediating effects of KM given these data, as the direct impact of KM is yet uncertain. However the results cannot be generalized to other business organizations because Taiwanese high-tech industry companies and firms are involved.

Organizational performance was not objectively assessed in this study. The variation from the usual method may exaggerate the relationships between the variables. The study offers business-related practical implications and highlights management concerns with KM initiatives and an understanding of the impact of TQM on KM organizational innovation performance, but senior management was probably better off allocating resources to TQM than to KM if the end goal is innovation. The analysis provided above demonstrates the potential for TQM techniques to provide new information. Knowledge is developed, enhanced, and advanced to higher levels among individual, team, departmental, organizational, and inter-organizational level during the application of TQM practices. TQM practices promote learning, growth, and the internalization of improved routines, which results in the generation of new knowledge. Firms use TQM to make their processes more effective.

However, new information must be acquired and integrated across the entire organization if there are to be future advances and business excellence. It can be difficult for managers to develop and implement TQM procedures in a way that also results in the generation of new information. The six TQM practices: continuous improvement, statistical quality control, customer satisfaction management, process-improvement techniques, individual learning, and new product development methodologies are demonstrated in this article as contributing to the four different types of knowledge-creating processes: socialization, externalization, combination, and internalization (Asif et al., 2013).

Duran et al. (2014) indicated that the enterprises with TQM and ISO 9000 certificates are better in the fields of level of the knowledge obtained from the customer, participation of employees in the dissemination of knowledge, the quality process, the quality culture, and the quality performance than those without the mentioned certificates. As tacit knowledge within a company is documented and transformed into explicit knowledge, it is evident that employee

participation in knowledge distribution has increased significantly. It is possible to say that the information obtained supports the literature that through TQM, the organization adopts a culture that promotes quality management.

Realizing work-related activities together within this culture is crucial. The fundamental principle behind comprehensive quality management and knowledge transfer is to provide appropriate social control within the firm in order to foster a trustworthy environment. The study discovered that the relationship between quality and process had the greatest effect, with cost being the second-biggest impact. Particularly, limited employee knowledge-sharing participation and minimal engagement have a negative effect on the enterprise's quality culture. As a result, it is feasible to claim that the quality culture received a lower score. This finding supports the literature because only an effective TQM can lead to a shift in quality culture (Musa et al., 2022).

According to Molina et al. (2006), TQM has a collection of practices that have a significant impact on knowledge management, particularly on knowledge transfers. The findings offered theoretical backing for the association between QM and performance. They concluded that since TQM positively impacts knowledge transfer, it also influences the firm's resources, competencies, and competitive advantage. However, a restriction in internal transfer of knowledge reduces the importance of TQM teamwork. Samples were collected from large Spanish firms and the response rate of 20.21% was low which could lead to a possible sampling bias due to non-respondent firms. Non-response bias may make the measured value for the sample inaccurate. They recommended a deeper study of this relation to take into account the different kinds of teams in TQM and their relation to knowledge transfers to improve understanding of this relationship.

3.3. Knowledge Management Strategies

To examine how knowledge management strategies can be integrated with the quality management system for effective implementation in the project delivery, Ooi (2014) indicated KM activities like knowledge gathering, distribution, and application extensively benefit from TQM practices like strategic planning and human resource management. However, there are substantial differences in how TQM is applied to KM activities in both manufacturing and service. Regarding whether TQM practices may motivate KM activities practically, this research has offered numerous useful techniques for Malaysia's enterprises.

Although many businesses have adopted these techniques, it was still important to develop, test, and research the TQM builds a model that could contribute to KM. The findings of this study clearly showed that TQM practices like strategic planning and human resource management have positive effects on KM activities (i.e., knowledge acquisition, distribution, and application). In contrast, process management has significant negative effects on knowledge acquisition and distribution among the sampled Malaysian companies. Additionally, it was

discovered that an industry type had a substantial impact on knowledge application but had no significant impact on knowledge acquisition or knowledge dissemination, indicating that there is a significance difference in how TQM is applied in KM practices between the manufacturing and service industries and could be different in the construction industry Additionally, the lack of a substantial relationship between firm size and KM suggests that TQM, is crucial for knowledge management implementation.

The main finding of this study is that these firms' management teams will have a better awareness of the TQM components so they may focus on encouraging knowledge-sharing initiatives. The findings showed that in Malaysian firms, TQM practices had a positive and significant connection with KM. Furthermore, it has been shown that while process management has a significant impact on knowledge distribution and knowledge acquisition, strategic planning and human resource management have a positive impact on KM activities (i.e., knowledge acquisition, distribution, and application).

Strategic planning and human resource management of TQM, showed positive relationships with KM among Malaysian manufacturing and service organizations, but they did not explain how it could be applied in the real world. The narrow scope of the research which focused on Malaysian manufacturing and service businesses could not be generalized.

The survey was conducted among Malaysian businesses that intended to apply for or had already received ISO 9001 certification; as a result, there may have been response bias and a lack of knowledge among the respondents. The survey questionnaire may still include incomplete responses and uninformed respondents. Hence field observations and interviews with the full-time managerial staff should be conducted as a follow-up to this study.

Garstenauer et al. (2015) indicate that the implementation of a KM and TQM plan helps to increase product quality and that a firm with a KM and QM strategy is more effective than a company without one. The study also found that because the organizations involved in the study functioned in similar environmental and cultural contexts, TQM strategy has a substantial impact on quality performance. Throughout the course of the research, no policy modifications were discovered that had a different effect on any of the sites, with the exception of the KM/QM strategy implementation. They recommended future research to assess the relative importance of the various individual components and factor combinations that affected the study's findings, with the exception of how the KM/QM strategy was implemented. The success of KM/QM strategy intervention in additional manufacturing businesses or various industry sectors is another important aspect because this research only covered one company with KM/QM strategy intervention. The quantitative approach used could not give the option to seek clarification even if the information seems confusing since it has very few opportunities to ask for clarity.

Ooi (2014) demonstrate in his study that TQM practices like strategic plan-

ning and human resource management have positive effects on KM activities like knowledge acquisition, distribution, and application. Moreover, it was discovered that industry type had a substantial impact on knowledge application but was not significantly connected to knowledge acquisition or knowledge dissemination, suggesting that there are major differences in how TQM is implemented across different industries. Additionally, it was discovered that an industry type significantly influences knowledge application but is not significantly linked to knowledge acquisition or knowledge dissemination, indicating that there are significant differences between the manufacturing and service industries in terms of how TQM is implemented in KM practices.

Furthermore, it was shown that the size of the industry was not significantly related to knowledge management, demonstrating that TQM is essential for KM adoption but not business size. In other words, as TQM may enable efficient KM, all businesses, regardless of size, are likely to implement it in their enterprises. The study's findings showed that these firms' management teams will have a better understanding of the TQM components so they may focus on encouraging knowledge-sharing activities. More precisely, it appears that strategic planning and human resource management are of paramount importance among the TQM elements that relate to knowledge management. The study's breadth was constrained by the research's exclusive emphasis on Malaysia's manufacturing and service sectors. Despite the fact that the survey questionnaire is considered to be a sufficiently cost-effective and reliable research method, the survey questionnaire may still experience response biases and a lack of respondent awareness. He recommended field observations and interviews with the full-time managerial staff to be conducted as a follow-up to this study.

Yusr et al. (2017) provided empirical support for the impact of TQM approaches on improving KM procedures. It was discovered that the KM procedures had a significant impact on how well manufacturing organizations performed in terms of innovation. Therefore, TQM procedures must be viewed as a single set of practices that can complement one another, starting with top management commitment and ending with the specific processes to report the essential data across the organization. These parallels provide a dynamic connection between the two disciplines. The study could not be generalized because it was restricted to industrial firms operating in the Malaysian context.

Aboyassin et al. (2011) reaffirm that knowledge diagnostics, development, sharing, storage, application, processes, and TQM have a significant relationship and that a company cannot expect to achieve comprehensive quality without the necessary knowledge. The analysis of the results showed that there were significant correlations between the TQM principles (adoption of quality and commitment of senior management, focus on customers, continuous improvement, training and education, and employee participation) and the KM processes diagnosis, acquisition, generation, sharing, storing, and application.

The most important steps to achieving overall excellence are knowledge ac-

quisition and application. The findings also showed that while the insurance companies engaged in significant KM, they lacked a culture of KM because most organizations simply used the whole TQM concepts ceremonially rather than as a quality improvement strategy. In addition, the study provides the distribution of a survey questionnaire to managers in the insurance sector in Jordan. Information about KM and TQM was gathered which could skew the data in a way that may not apply to the general population and could affect the authenticity of the result. The study could also not be generalized to other industries because it was restricted to Jordan's insurance industry.

3.4. Commitment of Senior Management

Zwain et al. (2011) discovered that knowledge sharing in Iraqi Higher Education Institutions (HEIs) was significantly and positively correlated with TQM's core components, including leadership commitment, strategic planning, continuous improvement, customer focus, process focus, employee involvement, training and learning, rewards and recognition, and employee involvement. This means that when there is leadership commitment and appropriate planning of the institution's activities, effective knowledge—sharing is achievable. This is consistent with earlier research that showed leadership to be a crucial component of any quality improvement.

To ensure that everyone in the business is adequately informed of the company's vision and objectives, effective implementation of TQM needs the managers to possess strong interpersonal and communication skills (Palm et al., 2014). The majority of institutions, however, execute the essential elements in fragments. Given the important and favourable effects on information sharing, implementing the fundamental components of TQM is essential. Therefore, it is important to develop ways to make these components better in order to increase the capacity for information sharing among academic staff. The researchers suggested that it should be enhanced but they did not specify how. The study only examined knowledge exchange through surveys and was restricted to HEIs.

According to Loke et al. (2012), TQM and KM can be linked, to improve knowledge creation, performance and profitability. The five TQM dimensions used in this study were leadership, strategic planning, customer focus, process management, information analysis, and human resource emphasis. The study discovered that, with TQM practices acting as the predictor variable, KM practices have a significant relationship with the supply chain learning outcome variable.

They offered concrete examples to demonstrate how combining TQM and KM may accelerate knowledge development, which will subsequently enhance performance and profitability. The findings supported the assertion that KM process, leadership, culture, technology, and evaluation must all be in place in order to promote learning. Implementing TQM and KM successfully calls for a long term commitment because the benefits of TQM and KM are complicated

and the specific benefits were not mentioned. Furthermore it was unclear to what extent supply chain learning was necessary to improve a company's capacity for innovation in new product creation. However, they restricted the study to managers from Federation of Malaysian Manufacturers member companies that offer both manufacturing and services which excluded workers and prevented the findings from being applied to other industries.

The gap is that, the data collected using the quantitative method may not apply to the general population. The random selection of managers could result in drawing false correlation. Despite the efforts to prevent bias, the characteristics of the randomized sample may not be guaranteed to apply to everyone. This means that the data applies to those who choose to participate. They recommended future research to explore the use of qualitative, non-survey techniques such as interviews and field observations.

The main variable attracting the researcher's attention is the significant impact that KM and TQM procedures have on the strategic competencies of the firm. Knowledge sharing serves as a partial mediator between TQM procedures and worker performance, according to Asrar-ul-haq (2017). The findings suggested that rather than being implemented separately, TQM procedures and KM procedures should be combined. However, because the sample size is so small and only includes software houses from four different regions in Pakistan, it is difficult to generalize the findings. Additionally, the study's conclusions were based solely on software houses. The study does not make use of every aspect of TQM practices. The author recommended other related constructs to be used in different industries.

Rajeshwaran and Aktharsha (2017) revealed that the most significant predictors of organizational performance were leadership commitment, strategic planning, continuous improvement, recognition and reward, employee involvement, and quality training. Accordingly, it was found that the key components and principles of TQM have a significant impact on organizational performance. Customer satisfaction requires an awareness of the demands and requirements of the customer. Thus KM can influence TQM through Leadership Commitment, Strategic Planning, Recognition and Reward, Involvement of Employee and Quality Training. An organization can involve in quality improvement activities if there is a clear direction by the management in the practice of TQM Principles. The study was limited to employees working in IT services organization.

Barua (2021) revealed that leadership, employee empowerment, customer focus, benchmarking, and information technology were all positively and significantly correlated with the four knowledge conversion types and the knowledge-creation process. Leadership is crucial for fostering internal quality culture, internal communication among personnel, and knowledge production within the firm. The sharing of tacit knowledge among organizational members depends on leadership's ability to foster a climate of trust among the workers. Employee empowerment will increase their willingness to impart their know-

ledge. The knowledge-creation process and customer focus have a strong beneficial correlation. However, the research was limited to knowledge production. The author suggested looking into how TQM affects other KM activities, including knowledge acquisition, storage, sharing and application. Although Bangladesh is a developing country and the study was conducted there, it is not possible to generalize its findings to other nations because it is limited to organizations in Bangladesh. Moreover, the data was collected in departments for marketing, sales, finance, human resources, and information technology.

4. Scientometric Analysis

Scientometric analysis is a technique to evaluate research impact and investigate citation relationships to map a specific knowledge area with trends extracted from the academic database (Hudha et al., 2020). To create and indicate an association in a citation of an article or publication, VOSViewer provides a text-mining capability. It places a focus on maps that can be shown graphically, is adaptable for bigger networks, and has text mining capabilities (Shen & Wang, 2020).

Table 2 is the result using the VOSviewer statistical approach, the term "knowledge" and "knowledge management" appeared 388 and 144 adding up to 502 occurrences is the most common author keyword in the literature but that was within the average year 2006 and 2007 with the total link strength of 183 and 48 respectively. The word "total quality management" and TQM appeared 223 and 136 adding up to 359 occurrences is the second most common author keyword within the year 2006. The term "project" appeared 239 and "project delivery" appeared 69 making 308 occurrences with 130 and 20 total link strength indicating the third author keyword in literature in the year 2007 and 2008.

Table 2. Keywords with network parameter.

Keywords	Cluster	Links	Occurrences	Total link strength	Avg. Pub. Year
Action	4	23	35	16	2006
Approach	6	52	131	57	2008.68
Benefit	6	32	60	26	2006.92
BIM	6	15	34	11	2014.54
Building	2	35	65	25	2009.36
Business	3	34	62	23	2005.91
Business process	4	36	65	29	2008.38
Care	5	24	69	40	2006.62
Case	5	21	41	16	2010.69
Chapter	1	27	47	23	2009.70

Continued

Communication	3	29	41	23	2008.78
Construction	4	30	58	30	2008.83
Construction process	6	17	31	12	2008.58
Construction project	6	24	59	16	2009.5
Cost	2	51	136	46	2006.33
Customer	2	34	73	29	2006.10
Data	4	38	74	36	2010.33
Delivery process	2	28	49	30	2007.8
Effect	2	36	91	27	2008.30
Empirical study	3	20	35	12	2005.67
Employee	5	13	23	11	2006.27
Evidence	5	24	33	15	2005.87
Example	5	26	44	17	2004.59
Field	3	31	54	15	2006.67
Firm	1	39	93	35	2005.51
Guide	4	23	27	17	2007.59
Individual	3	15	32	12	2005.83
Industry	6	42	114	33	2012.94
Integration	2	37	84	27	2008.33
Internet	4	20	25	14	2011.29
Issue	1	28	44	23	2009.22
Knowledge	3	64	388	183	2006.80
Knowledge sharing	3	39	114	48	2007.08
Life	4	16	32	12	2008.67
Literature	1	31	54	17	2008.12
Literature review	1	28	50	18	2010.44
Management process	3	46	126	52	2006.56
Network	3	34	86	35	2005.49
Overall quality	4	39	103	41	2006.85
Overview	1	12	28	15	2014.33
Paper	1	24	42	19	2007.26
Performance	2	55	197	79	2007.66

Continued

Person	6	28	48	26	2008.42
Principle	5	15	20	16	2008.5
Production	2	26	47	18	2007
Project	1	57	239	103	2007.45
Project delivery	6	29	69	20	2008.4
Project management	3	27	61	26	2007.54
Quality assurance	5	49	102	72	2008.43
Quality improvement	5	10	22	11	2010.18
Relationship	2	38	102	32	2005.25
Review	4	36	93	44	2007.5
Risk	6	27	64	23	2007
Site	3	23	52	22	2007.77
Success	3	36	69	23	2005.34
Supplier	2	20	27	14	2004.07
Supply chain	2	27	58	27	2005.55
Supply chain Management	2	37	72	33	2008.27
Systematic review	1	21	41	11	2009.45
Technique	4	24	38	21	2007.38
Technology	1	54	184	74	2007.54
Term	1	27	48	12	2006
Theory	1	37	88	32	2009.81
Time	2	48	157	47	2007.91
Tool	4	41	79	30	2008.53
Total quality management	5	58	228	98	2006.30
TQM	5	45	136	44	2006.5
Trust	3	31	61	23	2006.17
Use	1	47	100	41	2007.46
User	4	20	31	17	2005.94
Way	4	27	49	20	2006.7
Work	1	27	54	27	2007.40
Year	5	22	32	12	2007.91

Sources: Authors' own research.

Additionally, the term "performance" appeared 197 occurrences in the year 2007. Other author keywords were "technology" with 184 occurrences, time appeared 157, cost with 136 number of appearances, approach with 131 occurrences, industry with 114 appearances, quality assurance and relationship 102 occurrences each. The time period that researchers have used these keywords in their studies is shown by the average year from 2006 to 2008. Other keywords such as: Building, Business, Business process, Care, Case, Communication, Construction, Construction process, Construction project, Customer, Delivery process, Effect, Employee, Evidence, Field, Firm, Individual, Industry, Integration, Management process, Network, Overall quality, Principle, Production, Quality improvement, Relationship, Success, Supply chain, Supply chain Management, Technique, Technology and Trust attracted attention in publication and appeared beyond 50 occurrences. Other keywords such as: employee, delivery, BIM, processes which were below 50 occurrences did not attract higher attention within the publication year.

The links show how many nodes are connected to a specific node, whereas the total link strength shows how strong all of the linkages are connected to that node (Wang & Guo, 2022). For instance, the keyword (knowledge) has total link strength of 183, which is the biggest of all the nodes which indicates the strongest inter-relatedness to (project) with 103 strength link. This indicates that, knowledge is very essential for every project. The keyword (Total quality management) had total link strength of 98, (performance) had 79, and (management process) had total link strength of 52. This indicates the strong link between knowledge, total quality management, performance, management process and approach.

4.1. Network Visualization

Each item is represented by label network visualization. The weight of an item determines the size of the label; the heavier the weight, the larger the label. The label may not be visible for some items. This is done in order to avoid overlapping labels. The color of an item is determined by the cluster to which the item belongs. Lines between items represent links (van Eck & Waltman, 2023).

Figure 1 below represents the visualization of keywords and the relatedness of co-citation links. The figure has 6 clusters with the following colours: red, blue in two kinds, violet, yellow and green. Each colour represents keywords within a cluster. There were 73 items, 1153 links and 2760 total link strength.

4.2. Overlay Visualization

How items are mapped to the colors of keywords is shown in a color bar in the visualization's lower right corner. **Figure 2** displays the overlay visualization, where the colored keywords denote influence factors. Cluster 1 consists of: Overview, paper, project, systematic review, firm, issue, literature, and literature review, technology, term, theory, use and work making up 13 keywords. Cluster 2

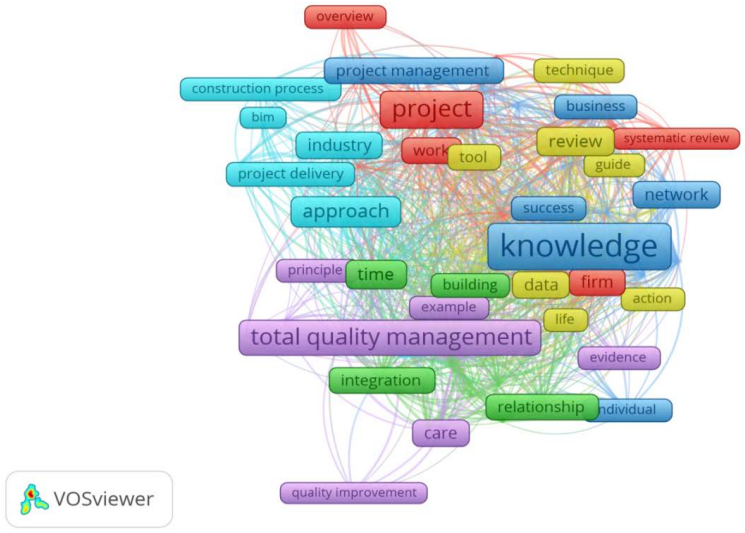

Figure 1. Network visualization.

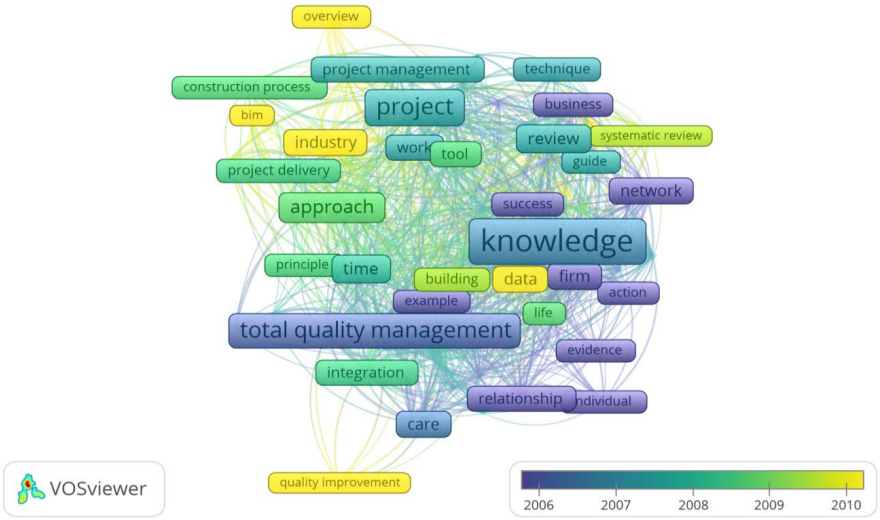

Figure 2. Overlay visualization.

which is made up of 13 items includes: Building, cost, customer, delivery process, effect, integration, performance, production, relationship, supliar, supply chain, supply chain management and time. Cluster 3 includes 13 items: Business, communication, emperical studies, field, individual, knowledge, knowledge sharing, management process, project management, network, site, success and trust. Cluster 4 includes: action, business process, construction, data, guide, internet, life, overall quality, review, technique, tool, user and way with 59 links and total link strength of 223. Cluster 5 with 58 and total link strength of 185 includes 11 items: Care, Case, employee, example, principles, quality assurance, quality improvement, total quality management, TQM, year, Cluster 6 Chapter includes 9 items: Approach, Benefit, BIM, Construction process, Construciton project, industry, person, project delivery and risk. All these keywords have a very strong link among each other.

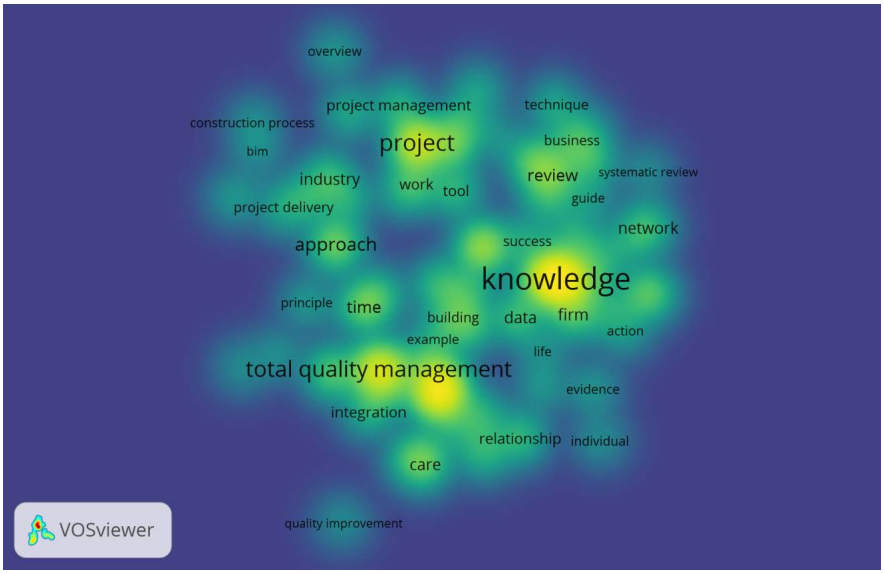

Figure 3. Density visualization.

4.3. Density Visualization

The color at each point in the item density display represents the density of objects. The color scheme includes blue, green, and yellow. The more frequently a keyword appears in literature, the larger it is in the yellow. In Figure 3 of the density visualization, the following keywords: project, knowledge, total quality management, appeared larger in the yellow colour. On the other hand keywords such as; quality improvement, construction process, BIM appears fading indicating that; their occurrence in literature is less.

5. Conclusion

In the industrial and service industries, KM and TQM has been the subject of several studies. The results showed that leadership commitment and customer focus were important elements that might significantly affect the relationship between TQM and KM. The results supported the idea that organizational learning, which affected the relationship between KM and TQM, required the presence of KM process, leadership, culture, technology, and measurement. There are currently few empirical studies supporting this integration in the delivery of construction projects. The review could clearly demonstrate that there is a dearth of literature, particularly in developing nations, in the construction sector. This review also supports the literature's assertion that TQM practices and KM practices have a big impact on how well projects and organizations performance.

The scientometric analysis revealed that, there is a strong inter-relatedness of the keyword "knowledge" which is the biggest of all the nodes with total link strength of 183 and other keywords like Project with total link strength of 103. This indicates that, knowledge is very essential for every "project". The keyword "Total quality management" had total link strength of 98, "performance" had

total link strength of 79, and "management process" had total link strength of 52. This indicates the strong link between knowledge, total quality management, performance, management process and approach. These keywords attracted higher attention in literature from 2007 to 2010.

5.1. Implications for Practice

The thorough analysis presented in this work concludes with several relevant practical implications for practitioners. The results emphasize the importance of leadership commitment in advancing TQM procedures. The results of this study clearly show that KM processes are necessary to effectively improve TQM principles. On the managerial side, the study's findings will help decision-makers in the construction industry to understand how KM techniques can facilitate TQM practices in addition to improving the quality of the project delivery process.

KM approaches are crucial for integrating learning processes, into management planning, execution, and performance evaluation for ongoing project.

5.2. Future Direction

The objective of this review is to present the evidence supporting KM and TQM. The study brought to light the glaring gap in the body of knowledge regarding KM and TQM in developing countries. The literature that is currently accessible primarily focuses on KM practices in regard to the manufacturing and service industries. The review makes it clear that KM and TQM are important areas for further study. To address potential obstacles, these processes' nature and approach will differ from organization to organization. As a result, extensive and in-depth research is required in this area. According to this review, KM and TQM will prove to be a substantial advantage for firms and particularly in developing countries, where projects frequently execute poorly. Researchers can explore on these keywords expecially on the area of construction project dilivery.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

Aboyassin, N. A., Alkloub, M., & Moayyad, A. (2011). Achieving Total Quality Management Using Knowledge Management Practices: A Field Study at the Jordanian Insurance Sector. *International Journal of Commerce and Management, 21,* 394-409. https://doi.org/10.1108/10569211111189383

Asif, M., de Vries, H. J., & Ahmad, N. (2013). Knowledge Creation through Quality Management. *Total Quality Management & Business Excellence, 24,* 664-677. https://doi.org/10.1080/14783363.2013.791097

Asrar-ul-haq, M. (2017). An Empirical Investigation on TQM Practices and Knowledge Sharing Mediation in Software Industry. *The TQM Journal, 29,* 725-743. https://doi.org/10.1108/TQM-03-2017-0038

Asrar-ul-haq, M., & Anwar, S. (2016). A Systematic Review of Knowledge Management and Knowledge Sharing: Trends, Issues, and Challenges. *Cogent Business & Management, 3,* Article 1127744. https://doi.org/10.1080/23311975.2015.1127744

Barua, B. (2021). Impact of Total Quality Management Factors on Knowledge Creation in the Organizations of Bangladesh. *The TQM Journal, 33,* 1516-1543. https://doi.org/10.1108/TQM-06-2020-0145

Barua, B., Zaman, S., & Urme, U. N. (2018). Effect of Total Quality Management on Organizational Performance. *Journal of Emerging Technologies and Innovative Research, 5,* 9024-9050. https://www.jetir.org

Bramer, W. M., Rethlefsen, M. L., Kleijnen, J., & Franco, O. H. (2017). Optimal Database Combinations for Literature Searches in Systematic Reviews: A Prospective Exploratory Study. *Systematic Reviews, 6,* Article No. 245. https://doi.org/10.1186/s13643-017-0644-y

Calnan, N., Lipa, M. J., Paige, K. E., & Menezes, J. C. (2021). *A Lifecycle Approach to Knowledge Excellence in the Biopharmaceutical Industry.* CRC Press.

Ch, F. A., Khobreh, M., Nasiri, S., & Fathi, M. (2009). Knowledge Management Support for Quality Management to Achieve Higher Customer Satisfaction. In *2009 IEEE International Conference on Electro/Information Technology* (pp. 78-83). IEEE. https://doi.org/10.1109/EIT.2009.5189588

Colurcio, M. (2009). TQM: A Knowledge Enabler? *The TQM Journal, 21,* 236-248. https://doi.org/10.1108/17542730910953013

Costa, V., & Monteiro, S. (2016). Key Knowledge Management Processes for Innovation: A Systematic Literature Review. *VINE Journal of Information and Knowledge Management Systems, 46,* 386-410. https://doi.org/10.1108/VJIKMS-02-2015-0017

Deming, W. E. (2018). *The New Economics for Industry, Government, Education* (3rd ed.). MIT Press. https://doi.org/10.7551/mitpress/11458.001.0001

Duran, C., Çetindere, A., & Özcan, Ş. (2014). An Analysis on the Relationship between Total Quality Management Practices and Knowledge Management: The Case of Eskişehir. *Procedia-Social and Behavioral Sciences, 109,* 65-77. https://doi.org/10.1016/j.sbspro.2013.12.422

Garstenauer, A., Blackburn, T., & Olson, B. (2015). A Knowledge Management Based Approach to Quality Management for Large Manufacturing Organizations. *Engineering Management Journal, 26,* 47-58. https://doi.org/10.1080/10429247.2014.11432028

Ghaleb, H., Alhajlah, H. H., Abdullah, A. A. Bin, Kassem, M. A., & Al-sharafi, M. A. (2022). A Scientometric Analysis and Systematic Literature Review for Construction Project Complexity. *Buildings, 12,* Article 482. https://doi.org/10.3390/buildings12040482

Honarpour, A., & Jusoh, A. (2017). Knowledge Management and Total Quality Management: A Reciprocal Relationship. *International Journal of Quality & Reliability Management, 34,* 91-102. https://doi.org/10.1108/IJQRM-03-2014-0040

Hourani, N. (2017). The Impact of Total Quality Management on Knowledge Creation. *International Journal of Business and Social Science, 8,* 119-129.

Hsu, S., & Shen, H. (2005). Total Quality Management & Business Knowledge Management and Its Relationship with TQM Knowledge Management and Its Relationship with TQM. *Total Quality Management, 16,* 37-41. https://doi.org/10.1080/14783360500054111

Hudha, M. N., Hamidah, I., Permanasari, A., Abdullah, A. G., Rachman, I., & Matsumoto, T. (2020). Low Carbon Education: A Review and Bibliometric Analysis. *European*

Journal of Educational Research, 9, 319-329. https://doi.org/10.12973/eu-jer.9.1.319

Hung, R. Y., Lien, B. Y., & Fang, S. (2010). Knowledge as a Facilitator for Enhancing Innovation Performance through Total Quality Management. *Total Quality Management & Business Excellence, 21,* 425-438. https://doi.org/10.1080/14783361003606795

Jewell, C., & Flanagan, R. (2019). *Code of Quality Management—Guide to Best Practice Construction Quality Management*. Chartered Institute of Building.

Ju, T. L., Lin, B., Lin, C., & Kuo, H. (2006). TQM Critical Factors and KM Value Chain Activities. *Total Quality Management & Business Excellence, 17,* 373-393. https://doi.org/10.1080/14783360500451614

Lester, A. (2017). Project Management. *Project Management, Planning and Control* (Seventh Edition). Butterworth-Heinemann. https://doi.org/10.1016/B978-0-08-102020-3.00002-4

Loke, S.-P., Downe, A. G., Sambasivan, M., & Khalid, K. (2012). A Structural Approach to Integrating Total Quality Management and Knowledge Management with Supply Chain Learning. *Journal of Business Economics and Management, 13,* 776-800. https://doi.org/10.3846/16111699.2011.620170

Mane, P. P., & Patil, J. R. (2017). Quality Management System at Construction Projects. *Proceedings of the Civil Engineering PG Conference*.

Mellat-Parast, M., & Digman, L. A. (2008). Learning: The Interface of Quality Management and Strategic Alliances. *International Journal of Production Economics, 114,* 820-829. https://doi.org/10.1016/j.ijpe.2008.04.003

Moballeghi, M., & Galyani Moghaddam, G. (2008). Knowledge Management and TQM: An Integrated Approach to Management. *GITAM Journal of Management, 6,* 45-54.

Molina, L. M., Lloréns-Montes, J., & Ruiz-Moreno, A. (2006). Relationship between Quality Management Practices and Knowledge Transfer. *Journal of Operations Management, 25,* 682-701. https://doi.org/10.1016/j.jom.2006.04.007

Musa, S., Yahiya, A., Farhan, S., & Alabdullah, I. (2022). Total Quality Management in Construction Projects in Jordan. *European Journal of Business and Management Research, 7,* 63-68. https://doi.org/10.24018/ejbmr.2022.7.2.1303

Ooi, K. (2014). TQM: A Facilitator to Enhance Knowledge Management? A Structural Analysis. *Expert Systems with Applications, 41,* 5167-5179. https://doi.org/10.1016/j.eswa.2014.03.013

Palm, K., Lilja, J., & Wiklund, H. (2014). The Challenge of Integrating Innovation and Quality Management Practice. *Total Quality Management and Business Excellence, 27,* 34-47. https://doi.org/10.1080/14783363.2014.939841

Payal, R., Ahmed, S., & Debnath, R. M. (2019). Impact of Knowledge Management on Organizational Performance: An Application of Structural Equation Modeling. *VINE Journal of Information and Knowledge Management Systems, 49,* 510-530. https://doi.org/10.1108/VJIKMS-07-2018-0063

PMBOK Guide (2017). *Project Management Body of Knowledge* (6th ed.). Project Management Institute, Inc.

Rajeshwaran, N. R., & Aktharsha, U. (2017). Relationship between Total Quality Management, Knowledge Management and Organizational Performance in IT Organization. *International Journal of Business and Management Invention, 6,* 44-54.

Rhem, A. J. (2017). *Knowledge Management in Practice*. Auerbach Publications. https://doi.org/10.1201/9781315374376

Ribiere, V., & Khorramshahgol, R. (2004). Integrating Total Quality Management and

Knowledge Management. *Integrating Total Quality Management and Knowledge Management, XVI,* 39-54.

Sallam, A., Eid, A., Elfaramawy, A., & Khodier, L. (2018). Applications of Knowledge Management in Construction: A Literature Review. *International Journal on the Academic Research Community Publication, 2,* 1-18. https://doi.org/10.21625/archive.v2i3.342

Senaratne, S., Nimashi, M., Rodrigo, N., Jin, X., & Perera, S. (2021). Current Trends and Future Directions in Knowledge Management in Construction Research Using Social Network Analysis. *Buildings, 11,* Article 599. https://doi.org/10.3390/buildings11120599

Shen, X., & Wang, L. (2020). Topic Evolution and Emerging Topic Analysis Based on Open Source Software. *Journal of Data and Information Science, 5,* 126-136. https://doi.org/10.2478/jdis-2020-0033

Soltanpanah, H., & Vaisi, B. (2014). Study of the Relationship between Knowledge Management and Project Quality Management Considering the Key Knowledge Factors in Construction Industry. *Journal of Applied Sciences, 14,* 2745-2749. https://doi.org/10.3923/jas.2014.2745.2749

Stewart, D., & Waddell, D. (2008). Knowledge Management: The Fundamental Component for Delivery of Quality. *Total Quality Management and Business Excellence, 19,* 987-996. https://doi.org/10.1080/14783360802227803

Susanti, M., & Reza, H. K. (2022). A Bibliometric and Visualized Analysis of Mobile Banking Research Using VOSviewer. *East Asian Journal of Multidisciplinary Research, 1,* 2377-2388. https://doi.org/10.55927/eajmr.v1i10.1947

van Eck, N. J., & Waltman, L. (2023). *VOSviewer Manual*. Univeristeit Leiden. http://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.1.pdf

van Tulder, M., Furlan, A., Bombardier, C., & Bouter, L. (2003). Updated Method Guidelines for Systematic Reviews in the Cochrane Collaboration Back Review Group. *Spine, 28,* 1290-1299. https://doi.org/10.1097/01.BRS.0000065484.95996.AF

Vassar, M., Yerokhin, V., Sinnett, P. M., Weiher, M., Muckelrath, H., Carr, B., Varney, L., & Cook, G. (2017). Database Selection in Systematic Reviews: An Insight through Clinical Neurology. *Health Information and Libraries Journal, 34,* 156-164. https://doi.org/10.1111/hir.12176

Waddell, D., & Stewart, D. (2008). Knowledge Management as Perceived by Quality Practitioners. *The TQM Journal, 20,* 31-44. https://doi.org/10.1108/09544780810842884

Wang, K., & Guo, F. (2022). Towards Sustainable Development through the Perspective of Construction 4.0: Systematic Literature Review and Bibliometric Analysis. *MDPI, 12,* 1708. https://doi.org/https://doi.org/10.3390/buildings12101708

Yusr, M. M., Sanuri, S., Mokhtar, M., Othman, A. R., & Sulaiman, Y. (2017). Does Interaction between TQM Practices and Knowledge Management Processes Enhance the Innovation Performance? *International Journal of Quality & Reliability Management, 34,* 955-974. https://doi.org/10.1108/IJQRM-09-2014-0138

Zetie, S. (2002). The Quality Circle Approach to Knowledge Management. *Managerial Auditing Journal, 17,* 317-321. https://doi.org/10.1108/02686900210434096

Zwain, A. A. A., Teong, L. K., & Othman, S. N. (2011). TQM Core Elements and Knowledge Sharing: An Empirical Study of Iraqi HEIs. *British Journal of Economics, Finance and Management Sciences, 3,* 1-19.