| RESEARCH ARTICLE

Knowledge and Quality Management: How knowledge sharing influences the application of quality tools

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| ABSTRACT

Organizations are becoming increasingly competitive and are constantly seeking new ways to raise productivity and cut costs. In this context, quality management, using the seven quality tools, can help better align products and services with customer expectations and support faster, more reliable decision-making. Knowledge Management also offers strategies that add value to organizational processes and serve as a key element in strengthening competitive advantage. Accordingly, the main objective of this study is to examine whether knowledge-sharing practices can promote the dissemination and use of Quality Management Tools in an agribusiness company. A descriptive and exploratory study was carried out using a structured questionnaire. The research can help the organization apply quality management tools through knowledge-sharing practices, enabling smarter and more efficient work. It also contributes to academic literature, given the shortage of studies that address the intersection between Knowledge Management and quality management.

1.   Introduction

The rapid pace of development and integration of digital technologies, such as cloud computing and data-centric business strategies, has significantly amplified both the amount and monetary value of sensitive data being processed and managed by modern-day enterprises. Organizations increasingly accumulate, process, and store large volumes of personal data, financial

1. Introduction

Quality Management encourages the engagement and involvement of all members of the organization in guaranteeing the quality of products and services, minimizing errors, costs, and rework, and consistently aiming at customer satisfaction. Quality Management Tools (QMT) contributes to lowering expenses, waste, and production-related issues by refining procedures, applying inspection tests, monitoring production time, and planning preventive maintenance [1]. To aid decision-making in both administrative and operational activities, organizations use a set of tools known as the "seven QMT": i) flowchart, ii) cause-and-effect diagram (Ishikawa), iii) checklist, iv) Pareto chart, v) histogram, vi) scatter diagram, and vii) statistical process control (SPC) chart [2].

QMT remains little used in organizations because only a limited number of people know how to apply these tools, and this knowledge is often hard to obtain and disseminate among members of the organization, which can result in unsuccessful outcomes [3]. In this context, Knowledge Management (KM) offers strategies that enhance the value of organizational processes and serve as a crucial element for strengthening competitive advantage [4].

Thus, it is evident that a shared objective of Quality Management and KM is to generate added value for organizational processes. Knowledge sharing enables organizations to convert tacit knowledge—i.e., that is individual and held by employees—into explicit knowledge that becomes accessible to all [5]. When professionals fail to share what they know, they can cause waste of time and resources through rework, unnecessary expenses, quality problems in products and services, and, as a result, customer dissatisfaction. The combination of knowledge sharing with QMT provides organizations with a competitive advantage [4].

Quality Management improves the efficiency and effectiveness of processes in various areas, but its success depends on fostering a culture of knowledge sharing so that best practices, expertise, and colleagues' experiences are readily available. However, many organizations still fail to adopt the "seven QMT" due to a lack of knowledge, resistance to change, and insufficient commitment.

This study urges organizations to implement knowledge-sharing practices to spread QMT across different sectors. It also positions knowledge sharing as a key avenue for strengthening organizational understanding of QMT. The research offers guidance on how to combine Quality Management with knowledge-sharing practices to enhance the efficiency and effectiveness of organizational processes, fostering a collaborative work environment with higher levels of participant engagement. Accordingly, this study poses the following research question: "Can knowledge sharing practices promote the dissemination of QMT within an organization?". Guided by this question, our objective was to determine whether knowledge sharing practices can spread the use of QMT in a large company in the agribusiness sector. We propose 'Knowledge Sharing Practices' as a means to address the limited utilization of 'QMT'.

2. Literature Review

2.1. Quality Management

The emphasis on Quality Management is shaped by global strategic transformations, enabling organizations to compete in a labor market that values knowledge, skills, and attitudes. QMTs are important for sustaining quality management efforts, as they assist in detecting problems, identifying their causes, and planning corrective actions [6]. These QMTs are straightforward yet essential methods that help companies uncover the origins and extent of problems, as well as the links between causes and issues, thereby contributing to process improvement [7].

The continuous improvement process for products comprises the following stages for identifying priority problems: observation and data collection, causal analysis, planning and implementation of actions, verification of results, and standardization [2]. To effectively carry out these stages, the widely recognized "seven QMT" should be applied in most organizational sectors. These tools are: i) flowchart, ii) cause-and-effect (Ishikawa) diagram, iii) checklist, iv) Pareto chart, v) histogram, vi) scatter plot, and vii) statistical process control chart. Collectively, these seven tools offer explicit rules, structures, and procedures that support process analysis and the pursuit of improvements and corrective actions aimed at raising the quality of products and services. Each quality management tool is briefly described below.

Flowcharts. The flowchart consists of graphical representations that show the stages of a process and their features, providing an overall view and clarifying how they interact with one another.

Ishikawa's cause-and-effect diagram. Ishikawa aims to minimize errors in the processes used to identify causes and effects, in order to achieve satisfactory quality outcomes [8].

Histograms. Histogram is a valuable tool for process control because it displays how often data values occur and thus provides a profile of the dataset's variation [9].

Pareto diagram. This tool is a widely acknowledged analytical approach in the industry. Developed by the Italian economist Vilfredo Pareto while examining the distribution of demand within a society, Pareto's analysis serves as a straightforward yet highly influential method. It is grounded in the observation that a small number of causes can be responsible for a large proportion of problems or defects [10].

Scatter plot. This kind of plot is useful for linking a cause to its effect, that is, for identifying the type of relationship that exists between two variables. According to [2], the correlation between two variables ranges from −1 to 1. This means that the closer the correlation value is to 1, the stronger the positive correlation; and the closer it is to −1, the stronger the negative correlation. In addition, when the correlation is zero, there is no relationship between the variables; when the correlation equals 1, it represents a perfect positive correlation; and when it equals −1, it represents a perfect negative correlation.

2.2. Knowledge Management

KM is a collection of methods designed to structure organizations, focusing on the management of knowledge and information in order to respond to ongoing changes in the business environment. According to [11], knowledge consists of two dimensions: explicit and tacit. On the one hand, explicit knowledge requires that information be formally recorded in specific formats—such as documents, wikis, git repositories, websites, semantic web resources, ontologies, and academic papers—so that it can be

easily viewed and analyzed. On the other hand, tacit knowledge is hard to formalize and share because it is gained through personal experience and daily practice and is stored in particular brain regions, such as the frontal cortex [12, 13, 14, 15].

KM requires a clear and structured process for identifying, generating, updating, and applying knowledge to benefit the organization. This supports effective transfer and use of existing knowledge and prevents time being wasted on recreating solutions that already exist in individuals' expertise and experience [16]. In addition, for knowledge to be properly managed, it must be disseminated and treated as a strategy for sharing insights among numerous members of an organization [14, 17]. This sharing occurs through both formal and informal channels. Exchanging knowledge can strengthen organizations' and groups' capacity to respond to environmental uncertainty and complexity through these formal and informal practices.

Knowledge sharing is easier when organizational structures are flatter, with open workspaces that enable job rotation and when there are many informal gatherings alongside formal meetings ([15]). Furthermore, knowledge sharing within organizations is shaped by a variety of factors that can affect the process in multiple ways (Szulanski, 2000). Employees often do not share knowledge spontaneously, as they expect some return for the information they provide, tend to regard knowledge as a source of power, and fear that sharing it might reduce their significance within the organization [5].

Barriers to achieving knowledge sharing and creation can be grouped into two main types such as individual and organizational. Individual barriers relate to a person's capacity to assimilate knowledge and the potential threat it poses to their self-image. Organizational barriers, according to [11], fall into four categories: the absence of a shared, legitimate language, a lack of organizational narratives, insufficient procedures, and constraining organizational paradigms.

Followed by vague or confusing language, entrenched organizational narratives and outdated procedures can impede innovation and change, leading to resistance among collaborators [19]. Moreover, organizational vision, mission, and values can obstruct the generation and dissemination of knowledge by solidifying paradigms that, once entrenched, make it difficult to absorb new knowledge. This is especially true when these elements are not revised to reflect changes in the organization and the environment in which it operates [5]. Obstacles to knowledge sharing include fear of opportunistic behavior in partnerships, rivalry among colleagues, and the pursuit of personal recognition at the cost of collective achievement [11, 20].

An organization should prioritize knowledge sharing and foster an environment where employees actively exchange information with one another, thus realizing the associated benefits [21]. Cooperation is fundamental to an organization's success, and leaders must guarantee that their teams have access to all relevant information about the business. Accordingly, the organization should invest in training and personal development initiatives so that all collaborators are prepared to make effective use of the organization's shared data [20.

To support organizations in implementing knowledge-sharing practices, it is important to understand which KM tools and techniques to use and how to apply them [22]. Several techniques can be employed to promote knowledge sharing within an organization, including: i) mentorship schemes, in which a senior member passes on experience and insights to a junior colleague; ii) peer assists, designed to reduce the learning curve of a team; iii) learning reviews, conducted to generate continuous learning during the performance of an activity; iv) post-action reviews, used to assess and capture lessons learned once an activity or project is completed; v) storytelling, to communicate and contextualize events; vi) collaborative workspaces; vii) communities of practice, where members share concerns, ideas, or solutions; viii) document repositories; ix) blogs; x) video-based communication and webinars; and xi) knowledge clusters and expertise locators [23].

3. Research Method

This research is characterized as applied research with exploratory and descriptive objectives, employing a mixed-methods (qualitative and quantitative) approach and using literature review and fieldwork as its main technical procedures [24, 25]. In addition, the study is based on exploratory and descriptive purposes.

3.1 Research Settings

The study was conducted in three facilities belonging to an agribusiness company dedicated to producing conventional and modified starches for the food industry and other markets. The facilities are situated in cities four different cities in Paraná, Brazil. With more than a century of activity, the company articulates its vision as follows: "Our vision of success will result from our policy of pursuing excellence, creative work, and deep knowledge of our customers, through our quality management process and [...]". Quality management represents the company's main strategic asset.

The company was facing quality problems in several products, as reported by employees via email, chat, and in-person discussions. Company documentation advised all facility managers, process analysts, manufacturing unit analysts, quality supervisors, and their teams to use seven QMT to tackle these issues. The growing number of quality concerns caught our attention and led us to conduct a detailed investigation of the problem in order to support the company.

We began by re-examining the Quality Management literature to search for solutions to the identified problems. Interestingly, we discovered a scarcity of studies that explicitly report these issues. Even recent works addressing quality-related problems, such as [26, 27, 28, 29], predominantly recommend applying the seven QMT to prevent quality problems rather than

documenting such issues in practice. Next, we chose to administer a questionnaire in an attempt to pinpoint the root of the problem. In the third step, we processed and examined the questionnaire data and, unexpectedly, found that most employees had limited knowledge of QMT. Finally, we turned to the Knowledge Management literature and proposed several knowledge-sharing tools intended to encourage and support the use of QMT.

3.2 Questionnaire

We developed a questionnaire to assess needs related to the use of QMT within the company and to examine the motivations for adopting these tools, given that quality represents a fundamental organizational value. Based on this premise, we created a structured bivariate questionnaire that included items on the two variables and administered it to the participants. The aim was to measure both variables and allow for an analysis of their interrelationship. To achieve this, we designed a Google Forms survey with 126 items, generated from the combination of the two dimensions: "Knowledge Sharing Practices" and "QMT." The form was distributed to 17 company employees. The sample consisted of 3 facility managers aged 25–40, 9 process analysts (3 per manufacturing unit) aged 22–35, 3 quality supervisors aged 29–35, and 2 staff members aged 35–38, as shown in Graphs 1 and 2.
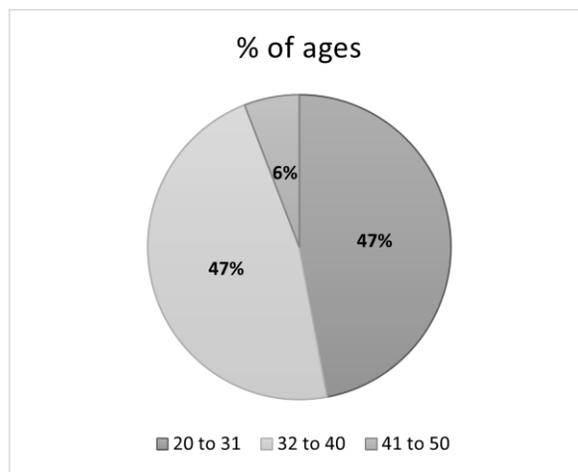
Graph 1: Age of the participants
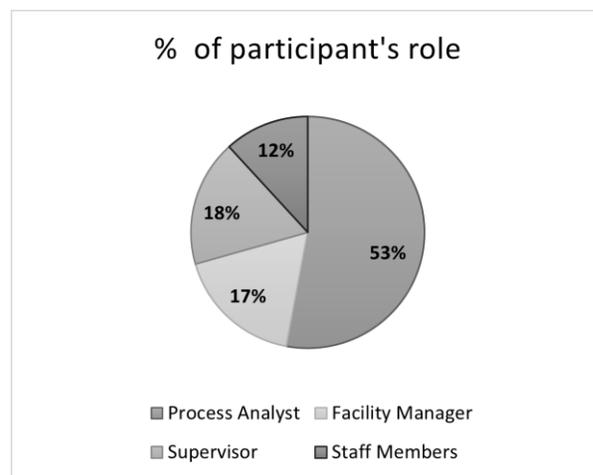
Graph 2: Role of the participants in the company

The questionnaire used a Likert scale, which is non-comparative and unidimensional by design. Participants were asked to indicate the strength of their agreement or disagreement with each item using an ordinal set of response options. In this study, five response categories were provided, each accompanied by both a numerical value and a verbal label. Common examples of such labels span from "Strongly Disagree" to "Strongly Agree." Assigning a verbal label to every response category produces

more reliable data than labeling only the scale endpoints [30]. Therefore, the response options in this questionnaire were: "Strongly Agree," "Agree," "Neither Agree nor Disagree," "Disagree," and "Strongly Disagree."

An ascending numeric coding scheme was applied to distinguish between the response options, in line with common practice (e.g., 1 to 5 or 0 to 6). In this research, the following values were assigned: 1.00 for Strongly Agree, 0.75 for Agree, 0.50 for Neither Agree nor Disagree, 0.25 for Disagree, and 0.0 for Strongly Disagree. The questionnaire's validity and reliability were examined using the data collected in Microsoft Excel. Reliability was evaluated with Cronbach's alpha, which measures internal consistency on a scale from 0 to 1, with 0.7 usually regarded as the lowest acceptable threshold. The resulting Cronbach's alpha was 0.9, signifying high reliability and adequate variation in responses. After data collection, the responses were exported to Microsoft Excel for subsequent analysis, which primarily consisted of computing the percentage distribution of responses.

4. Findings and Discussions

Each production unit is led by an industrial manager who supervises process analysts, general staff, and quality supervisors. These quality supervisors are accountable to the corporate manager responsible for the new business. However, even with a specific sector dedicated to quality management, the organization has not made effective use of tools to guarantee product quality and, by extension, customer satisfaction.

The company has primarily depended on control charts and product sampling analyses, in which decisions are largely driven by the operator's intuition—an approach that is not based on data and is therefore viewed as unreliable. Practices related to knowledge sharing were organized into a conceptual framework, which served as the basis for discussing the results obtained in the analysis.

For this study, 'learning' encompasses activities such as mentoring and peer assistance; 'Collaborative Work' includes communities of practice, knowledge cafés, and video sharing; 'Accountability' is associated with tools like expertise locators and knowledge clusters; the 'Knowledge Management System' (KMS) covers knowledge portals, knowledge bases, and knowledge libraries; 'Ba Spaces' refer to both virtual collaboration environments and physical spaces; 'Validation and Knowledge Evaluation' involve learning reviews and post-action evaluations; and 'Knowledge Socialization' concerns blogs, social networks, storytelling, video communication, and webinars.

Analysis of the questionnaire responses shows that 56% of participants are familiar with QMT, 38% have only partial knowledge, and 6% have never encountered the concept. However, a significant portion of those who respondents reported never having attended QMT training in their organization, whereas 41% had received such training, which was delivered in 2021. These results indicate that although QMT are relatively well known among respondents, insufficient training has constrained their effective dissemination and use. Training plays a crucial role in improving employee performance by remedying gaps in knowledge and skills, while also fostering knowledge updating and ongoing improvement. Considering the reasons why the organization does not fully leverage QMT, our results seek to identify which knowledge-sharing practices respondents regard as most effective for spreading QMT. To this end, we carried out a diagnosis of knowledge-sharing practices, based on the framework described in the Asian Productivity Organization manual by [23]. Table 1 shows the diagnostic outcomes for Knowledge Management practices related to knowledge sharing.

Table 1: *t-Test* results of the level of agreement of knowledge sharing practices and % of QMT

KM Technique	Knowledge Sharing Practices	Pareto Diagram	Flow Chart	Histogram	Control Chart	Ishikawa	Check Sheet	Scatter Diagram
Learning	Mentoring	82.35	85.29	86.76	83.82	89.38	88.00	87.00
	Peer Assist	82.35	82.35	80.88	82.35	82.35	82.35	80.88
Collaborative work	Community of practice	69.12	73.53	76.47	76.47	73.53	77.94	29.41
	Knowledge café	66.18	67.65	66.18	64.71	61.76	60.29	55.88
	Video sharing	58.82	58.82	58.82	58.82	58.82	58.82	58.82
Accountability	Expertise Locator	55.88	57.35	57.35	57.35	54.41	44.12	45.59
	Knowledge cluster	51.47	51.47	52.94	50.00	48.53	52.94	56.25
Knowledge Management System	Knowledge portal	44.12	51.47	54.41	52.94	45.59	42.19	36.76
	Knowledge base	50.00	48.53	50.00	47.06	50.00	45.59	25.00
	Knowledge library	29.41	32.35	30.88	29.41	29.41	27.94	45.59

Ba spaces	Collaborative virtual spaces	45.31	42.65	47.06	48.53	41.18	39.71	47.06
	Physical spaces	39.71	36.76	33.82	33.82	30.88	30.88	35.29
Validation and knowledge assessment	Learning review	37.50	35.29	35.29	39.06	38.24	32.35	30.88
Knowledge socialization	Post-action assessment	29.41	30.88	31.25	30.88	33.82	30.88	30.88
	Blog	26.47	22.06	26.47	25.00	26.47	19.12	20.59
	Social networks	19.12	16.18	19.12	19.12	16.18	26.47	30.88
	Storytelling	42.65	42.65	45.59	44.12	45.59	41.18	39.71
	Video communications and webinars	30.88	30.88	32.35	29.41	30.88	47.06	50.00

4.1 Learning

The conceptual learning framework includes knowledge-sharing practices (i.e., mentoring and peer assistance), which attained agreement levels of 86.09% and 81.93%, respectively. This suggests that the conceptual structure plays a substantial role in the spread of QMT. The mentoring scheme consists of an experienced mentor guiding an individual with less expertise in a given field, with the goals of building skills, fostering understanding of the organization and its culture, and strengthening the employee's competence in a particular subject [31]. Mentoring can be introduced in the organization in two main ways: through formal mentoring programs with regular group sessions or one-on-one meetings for employees who wish to receive mentoring. It may also occur informally, when the mentor naturally shares knowledge in the workplace [32]. Peer assistance is likewise positively evaluated by respondents and is viewed as an effective mechanism for disseminating QMT, as reflected in the reported levels of agreement.

4.2 Collaborative Work

The conceptual structure of collaborative work includes knowledge-sharing practices such as communities of practice, knowledge cafés, and video sharing. These practices obtained agreement levels of 68.07%, 63.24%, and 58.82%, respectively. Communities of practice are groups that foster interaction and knowledge exchange among members, encouraging continuous learning and mutual engagement [33]. Although previous studies indicate that communities of practice can support the dissemination of QMT, respondents in this study did not view this practice as effective for that purpose. Consequently, its implementation in organizations is not considered necessary. A knowledge café offers a setting for discussion and reflection on work-related issues, especially in hierarchical organizations [33]. Even though this practice can provide deeper understanding of organizational problems, respondents did not regard it as effective in spreading the use of QMT. Therefore, adopting this practice in the organization is also deemed unnecessary. The video sharing and webinar practice, which showed an agreement level of 58.82% for all tools, is used for videoconferencing and is intended to facilitate real-time information sharing and discussion, allowing participants to exchange audio, documents, and images [23]. Since the same agreement level of 58.82% was found for all QMT, respondents in this study likewise consider knowledge sharing through video sharing and webinars to be ineffective for promoting the use of QMT. Thus, the adoption of this practice in organizations is not recommended.

4.3 Accountability

The conceptual accountability structure encompasses knowledge-sharing mechanisms such as expertise locators and knowledge clusters, which showed agreement levels of 53.15% and 51.94%, respectively. This structure links individuals who require specific knowledge with those who possess it [15]. Nevertheless, respondents do not view the expertise locator practice as effective for disseminating QMT. An expertise locator may take the form of a basic webpage or a more advanced software solution. From this, it can be concluded that participants in this study do not regard the expertise locator as the most effective approach for promoting the dissemination of QMT. While identifying who holds expertise may be valuable for other types of organizational knowledge, it is not seen as advantageous for QMT, as reflected in the reported agreement levels. Therefore, implementing this practice in the organization is not recommended. Among the elements of this structure, knowledge clusters received the lowest agreement level, at 51.94%. This practice consists of assembling individuals from the same organizational area into a group dedicated to sharing knowledge. Knowledge clusters are generally oriented toward product development [23]. Respondents do not consider this form of knowledge sharing appropriate for understanding and applying QMT, given its main focus on product development. As a result, the adoption of this practice in the organization is likewise not advised.

4.4 Knowledge Management System
The conceptual structure of the Knowledge Management System comprises knowledge-sharing mechanisms such as a knowledge portal, a knowledge base, and a knowledge library, which received agreement levels of 46.78%, 45.17%, and 32.14%, respectively. These mechanisms are designed to store, organize, and enhance the accessibility and practical use of knowledge [15, 34]. However, respondents did not regard this conceptual structure as the most effective way to disseminate the use of QMT. This view is likely linked to their professional profiles: they generally do not devote substantial time to computer-based reading or in-depth research on specific topics, as most of their work hours are focused on production activities. Therefore, adopting the knowledge-sharing practices embedded in this conceptual structure is not advisable.

4.5 Ba Space
Ba space structure encompasses knowledge-sharing practices in both virtual collaborative environments and physical settings, which obtained agreement levels of 44.50% and 34.45%, respectively. The knowledge- sharing practices in these two types of spaces are comparable, as they are intended to enhance communication, knowledge exchange, teamwork, and collaborative effectiveness in projects, idea development, and collective decision-making [23, 35]. Based on the respondents' agreement levels for this structure, it can be inferred that they do not consider the current knowledge-sharing practices effective for promoting the use of QMT. Although the literature indicates that physical and virtual spaces can support knowledge sharing, the respondents do not concur with this view, since the agreement level for this structure was low. Consequently, implementing knowledge-sharing practices within this conceptual structure in the organization is not recommended.

4.6 Validation and Knowledge Assessment
The Validation and Knowledge Assessment structure includes the knowledge-sharing practices of learning reviews and post-action assessments, which recorded agreement levels of 35.52% and 31.14%, respectively. The learning review practice focuses on continuous learning during the execution of an activity, enabling employees to learn rapidly, adapt, and enhance the activity in real time. In contrast, the post-action assessment practice is conducted after an activity or project has been completed, aiming to evaluate and document the lessons learned. This method helps employees understand what occurred, why it occurred, and how to maintain strengths while addressing weaknesses [23]. Based on the respondents' agreement scores for this structure, it can be inferred that they do not consider the existing knowledge-sharing practices within this structure to be effective for promoting the use of QMT. Consequently, it is not recommended to adopt the knowledge-sharing practices from this conceptual structure in the organization.

4.7 Knowledge Socialization
The conceptual knowledge socialization structure consisted of several knowledge-sharing practices—blogs, social networks, storytelling, video communication, and webinars—which obtained agreement levels of 23.74%, 21.01%, 43.07%, and 35.92%, respectively, making this the conceptual structure with the lowest overall level of agreement. Blogs, as a knowledge-sharing practice, are useful for reaching a wide audience and offer a straightforward way to disseminate information. Network-based knowledge-sharing services are effective for exchanging content within a targeted group that shares a common area of interest. Through online systems, people with similar needs or interests can connect and interact [6. 23]. Meanwhile, knowledge-sharing practices such as video communication and webinars are implemented via videoconferencing tools and are intended to share and discuss real time, allowing participants to exchange audio, documents, and images. Storytelling, as another knowledge-sharing method, conveys events through words, images, and sounds and is a particularly powerful approach for sharing knowledge, especially tacit knowledge [23, 36]. Consequently, knowledge-sharing through this Internet-based communication infrastructure has changed how people communicate, learn, seek entertainment, and conduct business, and it continues to have a substantial impact on society. The findings indicate that individuals place greater value on knowledge transmitted personally than on information obtained via the Internet. Respondents do not agree that the knowledge-sharing practices within this structure are effective for spreading the use of QMT. As a result, the implementation of these practices in the organization is not recommended.

4.8 Key Findings
The Pareto chart shown in Graph 3 highlights the most impactful knowledge-sharing practices for spreading QMT throughout the company.
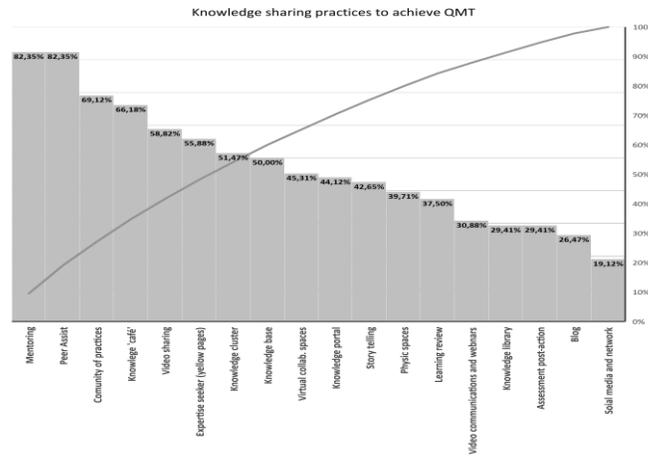
Graph 3: Pareto analysis regarding knowledge sharing and QMT

Graph 3 illustrates the relevance of various knowledge-sharing practices in achieving QMT. The horizontal axis presents different practices, while the vertical axis on the left shows the percentage of participants who identified each practice as important. The right vertical axis shows the cumulative percentage. Next, 'Communities of Practice' (66.18%), 'Knowledge Café' (58.82%), 'Video Sharing' (55.88%), 'Expertise Seeker' (Yellow Pages) (51.47%), and 'Knowledge Cluster' (50.00%) also play crucial roles, together representing a considerable share of the cumulative effect. These approaches underscore the value of structured group interaction and easy access to expert knowledge repositories. We categorized these as 'Secondary Practices', following the primary practices. The 'Moderate Impact Practices' are digital platforms that support knowledge sharing. In this category, we identified 'Knowledge Base' (45.31%), 'Virtual Collaborative Spaces' (44.12%), and 'Knowledge Portal' (42.65%) as having a moderate contribution to QMT. Practices such as Storytelling (39.71%), Physical Spaces (37.50%), Learning Review (30.88%), and Video Communications and Webinars (29.41%) have a lower individual impact but still provide a meaningful cumulative contribution. Accordingly, we labeled these as 'Less Impactful Practices'. Finally, we defined 'Least Impactful Practices' as those with the lowest relative impact on QMT, namely Knowledge Library (29.41%), Assessment Post-Action (26.47%), Blog (19.12%), and 'Social Media and Network' (19.12%). While these practices are still beneficial, they appear less critical than the more influential ones identified. Table 2 presents and highlights the highest- and lowest priority practices that a company could adopt, based on our findings.

Table 2: Knowledge-Sharing Practices and Their Impact

Category	Practice	Percentage (%)
Primary Practices	Mentoring	82.35
	Peer Assist	69.12
Secondary Practices	Communities of Practice	66.18
	Knowledge Café	58.82
	Video Sharing	55.88
	Expertise Seeker (Yellow Pages)	51.47
	Knowledge Cluster	50.00
Moderate Impact Practices	Knowledge Base	45.31
	Virtual Collaborative Spaces	44.12
	Knowledge Portal	42.65
Less Impactful Practices	Storytelling	39.71
	Physical Spaces	37.50
	Learning Review	30.88
	Video Communications and Webinars	29.41
Least Impactful Practices	Knowledge Library	29.41
	Assessment Post-Action	26.47
	Blog	19.12
	Social Media and Network	19.12

The cumulative curve shows that a relatively small set of practices accounts for a large share of the overall impact. This follows the Pareto 80/20 principle, where roughly 20% of the causes (practices) generate about 80% of the effects (in this case, impact on QMT). Here, the cumulative impact reaches about 82% after only six practices—namely, the primary and secondary ones—demonstrating the strong influence of the leading practices. This implies that concentrating on these top practices can deliver major improvements in QMT, making resource use and effort more efficient.

4.9 Limitations and Future Works

While this study provides valuable insights into the relationship between KM and quality management—especially regarding knowledge sharing and the application of quality tools—it is important to recognize several limitations. First, the reliance on self-reported data may have introduced bias, as respondents could have overstated their engagement in knowledge-sharing activities or their use of quality tools. Moreover, the cross-sectional nature of the research constrains our ability to draw causal conclusions from the observed relationships. Longitudinal designs are needed to clarify causality and to examine the long-term influence of knowledge sharing on quality management practices. Second, the generalizability of the results is limited. The sample was drawn from a particular industry and geographic area, which may not adequately reflect other sectors or international settings. Future studies should replicate this research in diverse industries and regions to improve the robustness and external validity of the findings. Third, the study mainly examined the direct link between knowledge sharing and the use of quality tools, which may have led to the omission of important mediating or moderating variables, such as organizational culture, leadership style, or technological infrastructure. Subsequent research could investigate these factors to develop a more holistic understanding of the underlying mechanisms.

Finally, as KM and quality management continue to develop, it is essential to regularly reassess and refine the theoretical and methodological approaches used in these domains. Future research should integrate emerging trends and technologies, including artificial intelligence and big data analytics, to investigate their influence on knowledge-sharing practices and quality management processes. Doing so will help ensure that the research remains current and aligned with ongoing advancements in the field.

5. Conclusion

The findings of this study confirm that the conceptual learning structure—which includes knowledge-sharing mechanisms such as mentorship schemes and peer assistance—received the highest levels of agreement from respondents, with 86.09% and 81.93% agreement, respectively, regarding its role in spreading the use of QMT. This underscores the effectiveness of structured and guided forms of interaction in supporting the adoption and practical application of QMT within organizations. In contrast, the knowledge socialization structure, encompassing more informal practices such as blogs, social networks, storytelling, video communication, and webinars, recorded markedly lower agreement levels of 23.74%, 21.01%, 43.07%, and 35.92%, respectively. These outcomes indicate that less formal and loosely organized methods of knowledge exchange may be less successful in encouraging the use of QMT. Notably, the mentorship scheme was identified as the most highly valued knowledge-sharing practice, highlighting the importance of individualized, mentor-led engagement for facilitating learning and encouraging the adoption of QMT. By contrast, social networks were perceived by respondents as the least effective avenue for promoting the dissemination of QMT. This study advances the academic discussion in two principal ways: first, by addressing a gap in existing research on knowledge-sharing practices designed to foster the use of QMT; and second, by stressing the pivotal role of mentoring and peer-assisted learning—especially when conducted face-to-face—in improving the spread of QMT within organizations. Future studies should examine a wider variety of knowledge-sharing approaches and carry out more detailed investigations of specific QMT. The limitations of this paper include its dependence on a univariate questionnaire for correlation analysis and time restrictions that constrained the possibility of conducting more extensive analyses.

Conflicts of Interest: The authors declare no conflict of interest.

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