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Innovation Knowledge Management Systems for Enhancing Education Quality Assurance at Rajamangala University of Technology Suvarnabhumi

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Abstract

Background and Aim: The ever-changing landscape of higher education worldwide has led academic institutions to seek innovative strategies for ensuring globally competitive standards of excellence remain firmly in place. Knowledge management has increasingly come to the fore as a pivotal process supporting the ongoing refinement of educational quality at its core. Nevertheless, challenges persist in Rajamangala University of Technology Suvarnabhumi in systematically harnessing the power of knowledge into existing quality assurance mechanisms. This research aims threefold: first, to evaluate the current state and constraints of the university's knowledge management application to quality assurance; second, to examine priority needs and defining success factors for crafting a customized knowledge management solution serving educational quality assurance; and third, to conceptualize and prototype an adaptive knowledge management system adequately responding to Rajamangala University of Technology Suvarnabhumi's unique context and institutional imperatives.

Materials and Methods: This mixed-methods study employed stratified random sampling to collect quantitative data from 276 university personnel. A five-point Likert scale questionnaire measured current Knowledge Management System (KMS) use and needs, demonstrating high reliability at 0.92. Descriptive statistics revealed frequency, percentage, means, and standard deviations of responses. Inferential statistics, including t-tests and one-way ANOVAs, identified significant differences at the 0.05 level. Six qualitative in-depth interviews with quality assurance administrators provided deep insights. Additionally, twelve quality assurance staff engaged in focus group discussions. Thematic analysis uncovered key themes within the qualitative data. Ultimately, findings informed the development of an innovative KMS using design thinking merged with the PDCA cycle. Fifteen quality assurance and IT experts then evaluated the effectiveness of the developed innovation.

Results: The study into the university's approach to knowledge management for quality assurance yielded intriguing findings. Firstly, the existing system was rated highly overall, with senior leadership endorsement seen as particularly strong. However, information technology use scored lower, highlighting a key area for improvement. A close examination pinpointed clear guidelines and administrators' commitment as chief strengths, while segmented data and the lack of an integrated digital solution posed major obstacles. Staff highlighted the pressing need for a unified, user-friendly technological framework to consolidate disparate sources of information, reduce duplicate data entry, support insightful analytics, and facilitate online exchange of expertise. To address this, an innovative five-pronged quality assurance knowledge management system was developed, centered on the continual Plan-Do-Check-Act cycle. At its core were an integrated database, advanced applications, core functionalities, evaluation mechanisms, and a learning community. The system proved highly effective overall, earning especially high marks for its impact.

Conclusion: The university had created an impressive system to organize its knowledge base that noticeably reduced duplicated efforts. It allowed staff to analyze information more thoroughly than ever before, gleaning valuable insights that impacted decision-making across divisions. Both junior and senior employees felt included in important discussions, sharing perspectives on how to strengthen the institution. This model shows great promise for other colleges in Thailand dealing with similarly intricate bureaucracies. With refinement, it could serve as an exemplar for rethinking how all members of a school - from freshman to dean - work together to continuously refine curriculum and operations. Its approach of pooling collective intelligence in a structured yet flexible manner may encourage lifelong dedication to scholarship within a community.

Keywords: Innovation; Knowledge Management; Educational Quality Assurance; Rajamangala University of Technology Suvarnabhumi

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Introduction

In an era increasingly defined by knowledge-driven societies, higher education institutions must develop innovative quality assurance (QA) approaches aligned with swiftly advancing technologies and escalating stakeholder expectations. Traditional QA systems often suffer from fragmented knowledge management, lacking integration with academic operations and institutional governance (Al-Jedaiah, 2020). A major limitation is the disconnection between knowledge management (KM) and QA, which impedes effective use of organisational knowledge in strategic decision-making and innovation. KM systematically organises dispersed knowledge-whether embedded in individuals or documents-into accessible formats that foster capacity building and institutional competitiveness. Critical success factors (CSFs) in KM, as identified by Somjai, Sirinapatpokin, and Kumtabut (2024), include human resource management, leadership, organisational learning, and information technology-all of which significantly influence organisational effectiveness and strategic coherence. However, KM and QA have frequently been treated in isolation, with limited application of transformative technologies like AI, big data analytics, and cloud computing in QA contexts. Furthermore, the development of digital communities of practice remains underdeveloped in Thailand, despite evidence from Seamsamak and Rathachatranon (2015) that faculty members at Kasetsart University highly value QA across teaching, research, service, and cultural dimensions, affirming the importance of robust QA for enhancing national educational standards.

Persistent challenges remain across Thai universities. Fragmented KM systems hinder deep data analysis and limit long-term organisational learning. Moreover, the absence of integrated digital platforms constrains knowledge exchange and collaborative engagement in QA efforts. As global attention shifts toward the design thinking process, human-centred methodology, emphasising empathy, ideation, prototyping, and critical reflection, presents new opportunities for educational innovation. Concurrently, digital storytelling has emerged as a vital 21st-century skill, blending communication, creativity, and media literacy. Meekhobtong et al. (2022) identified three key competencies in digital storytelling for undergraduates: narrative capability, creative thinking, and critical reasoning. These skills enable learners to communicate complex ideas and reflectively articulate experiences. At Rajamangala University of Technology Suvarnabhumi (RMUTSB), persistent barriers include the absence of a centralised data system and limited interdepartmental knowledge sharing due to structural, cultural, and technical constraints (Office of Educational Quality, 2021). This study aims to address such challenges by designing an integrated KM system that merges digital tools, collaborative learning, and QA processes. Using RMUTSB as a case study, it proposes a unified framework that connects data, knowledge, and stakeholders to sustainably elevate educational quality through strategic knowledge governance.

Research Objectives

1. To examine the current state of the knowledge management system for educational quality assurance at Rajamangala University of Technology Suvarnabhumi (RMUTSB).
2. To analyze the needs for an innovative knowledge management system for educational quality assurance as perceived by all stakeholders within RMUTSB.
3. To develop an innovative knowledge management system for educational quality assurance that is appropriate and responsive to the specific institutional context of RMUTSB.

Research Hypothesis

Personal factors-namely, gender, age group, educational attainment, job position, affiliated unit, and campus location- of personnel at Rajamangala University of Technology Suvarnabhumi significantly influence their perceptions of the current state of the knowledge management system for educational quality assurance.

Literature Review

1. Knowledge-Based Views and Knowledge Management: The knowledge-based view positions knowledge as an organisation's most strategically valuable asset, offering sustainable competitive

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advantage through its uniqueness and capacity to generate value. Consequently, Rajamangala University of Technology Suvarnabhumi (RMUTSB) must adopt a systematic approach to knowledge management (KM) to ensure continuous quality enhancement. KM is defined as a structured process that transforms data, information, ideas, actions, and experiences into usable knowledge and innovation. Nonaka and Takeuchi's SECI Model conceptualises the dynamic interaction between tacit and explicit knowledge through four stages: socialisation (sharing experiences to cultivate tacit knowledge), externalisation (articulating tacit knowledge), combination (organising explicit knowledge), and internalisation (practising explicit knowledge). Complementing this, Probst, Raub, and Romhardt present a comprehensive KM framework encompassing eight interrelated components: setting knowledge goals, identifying, acquiring, developing, sharing, applying, storing, and evaluating knowledge, enabling holistic and integrated knowledge management across institutional contexts.

2. Critical Success Factors of Knowledge Management and Their Impact on Organizational Performance: Somjai et al.'s (2024) comprehensive study, How the Critical Success Factors of Knowledge Management Affect the Different Perspectives of Organisational Performance and Organisational Strategy, identifies four critical success factors (CSFs) essential for effective knowledge management (KM): human resource management, leadership, organisational learning, and advanced information technology. These factors collectively influence organisational performance across customer satisfaction, financial outcomes, internal process efficiency, and sustained growth. The findings emphasise that successful implementation of KM-driven educational quality assurance requires the strategic integration of all four CSFs, where a capable IT infrastructure forms the backbone of the system, an organisational learning culture fosters continuous innovation, and strong leadership combined with proactive human resource development enables effective knowledge sharing and application throughout the institution.

3. Learning Organizations and Continuous Quality Improvement: Senge (1990), in his foundational work, identified five core disciplines essential to building a learning organisation: systems thinking, personal mastery, mental model transformation, shared vision, and team learning principles that resonate with Deming's (1986) Plan-Do-Check-Act (PDCA) cycle, which emphasises continuous improvement. Garvin et al. (2008) extended this perspective, asserting that effective learning organisations require supportive environments, structured learning processes, and leadership that actively fosters learning. These principles align with participatory, iterative approaches to quality assurance in higher education. In the context of Rajamangala University of Technology Suvarnabhumi (RMUTSB), positioning the institution as a learning organisation implies that innovative knowledge management for quality assurance must embed mechanisms that promote systems thinking, facilitate ongoing knowledge exchange, and translate learning into process improvement, where leadership at all levels plays a pivotal role in embedding a culture of continuous learning and quality advancement.

4. Educational Quality Assurance and Limitations of Current Systems: Educational quality assurance entails a systematic, continuous, and integrated process of evaluating, monitoring, and improving institutions and academic programmes, grounded in the Plan-Do-Check-Act (PDCA) framework. Thailand's National Higher Education Standards (2018) identify five core domains: student learning outcomes, research and innovation, academic services, arts and culture rooted in Thai identity, and institutional management. A study conducted in 2015 at Kasetsart University's Faculty of Forestry revealed that staff exhibited strong knowledge of quality assurance and recognised its effectiveness across fundamental academic missions-teaching, research, community engagement, and cultural preservation-yet also exposed persistent challenges, particularly the fragmented management of knowledge that hampers sustained impact. Present systems continue to face four critical shortcomings: disjointed data and knowledge flows inhibit holistic assessment; insufficient mechanisms for cross-departmental knowledge sharing hinder institutional learning; limited integration of quality assurance with innovation impedes advancement; and the absence of a robust information system constrains the effectiveness of both knowledge management and quality assurance functions.

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5. Innovation for Change and Change Management: Christensen's (1997) concept of disruptive innovation explains how transformative solutions often originate by meeting the unmet needs of marginalised user groups through simple, efficient, and low-cost approaches, eventually evolving to serve mainstream users. Applied to the development of knowledge management systems (KMS) for educational quality assurance, this model underscores the importance of designing user-responsive systems that adapt progressively to varying levels of readiness and acceptance. Fullan (2007) complements this view by outlining three critical dimensions for managing educational change-meaning, capacity, and sustainability-each essential for the successful implementation of a KMS. Adoption requires fostering understanding and acceptance among stakeholders, strengthening individual and institutional capabilities, and embedding system usage into the organisational culture. Furthermore, Meekhobtong et al. (2022) explored digital storytelling skills in undergraduates through a pedagogical framework based on the Design Thinking Process, identifying narrative ability, creativity, and critical thinking as foundational components. These elements can inform KMS design by leveraging storytelling to enhance knowledge creation and sharing, making knowledge transfer more meaningful, engaging, and effective within higher education institutions.

6. Related Research

6.1 Research on Knowledge Management in Higher Education: Somjai et al. (2024) investigated the critical success factors (CSFs) influencing knowledge management (KM) effectiveness in Thai universities, identifying human resource administration, leadership, organisational learning, and information technology as key drivers of organisational performance across customer satisfaction, financial outcomes, internal processes, and learning and growth perspectives-with organisational learning showing the strongest overall correlation. Aligning with these findings, Chantarasombat (2009) developed a six-phase KM model for educational quality assurance at Mahasarakham University, comprising leadership identification, participatory engagement, planning and capacity building, implementation, knowledge monitoring, and reflective evaluation, highlighting leadership at all levels as a decisive factor in success. Meekhobtong et al. (2022), focusing on undergraduate digital storytelling skills, proposed a pedagogical model based on the design thinking process encompassing five stages: empathising, data gathering, ideation, prototyping, and presentation. They identified digital narrative competency, creative thinking, and critical thinking as core skills. Their approach underscores the integration of creative and analytical capacities, offering valuable insights for KM innovation in higher education through experiential and reflective learning strategies.

6.2 Research on Educational Quality Assurance: Nakarin Sakhon et al. (2023) found that personnel participation and administrative efficiency directly influenced the success of educational quality assurance under the EdPEx framework at Rajamangala University of Technology Isan. This highlights the critical role of inclusive engagement across all organisational levels and effective management in driving quality assurance systems. Similarly, Seamsamak and Rathachatranon (2015), in their study of the Faculty of Forestry at Kasetsart University, reported that staff demonstrated strong knowledge of quality assurance, particularly in teaching, research, academic services, and cultural preservation. However, their findings also pointed to a common institutional weakness: the lack of integrated information systems, which are essential for quality assurance in the digital era. In support of these perspectives, Runrom (2023) identified a moderate positive correlation between knowledge management and the effectiveness of internal quality assurance in educational institutions, reinforcing the notion that knowledge management plays a pivotal role in enhancing organisational performance. These findings are consistent with those of Somjai et al. (2024), who reported that knowledge management significantly correlates with multiple dimensions of organisational outcomes.

6.3 Research on Factors Influencing the Acceptance and Use of Knowledge Management Systems: Abdullah and Elias (2022) proposed a conceptual framework for the adoption of knowledge management systems in higher education, identifying three core dimensions-technological, organisational, and environmental- as key determinants of adoption intention. Their model aligns with both the Technology Acceptance Model (Davis, 1989) and the Technology-Organisation-Environment (TOE) Framework, which emphasise the integration of these factors to facilitate effective technology

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implementation. Complementing this perspective, Haddist and Handayani (2020) developed a model connecting knowledge management components to organisational performance within the context of higher education quality assurance. Their findings revealed interrelationships among KM infrastructure, KM processes, and organisational creative learning, with organisational learning functioning as a mediating variable linking KM practices to performance outcomes.

6.4 Research on Organizational Culture, Leadership, and Knowledge Management: Djangone (2022) explored the relationship between organizational culture, leadership style, and organizational performance. The study found that a strong organizational culture and transformational leadership had a positive influence on knowledge management, which in turn contributed to improved performance. These findings support the work of Somjai et al. (2024), who identified leadership as one of the most influential factors in the success of knowledge management initiatives.

7. Conceptual Framework

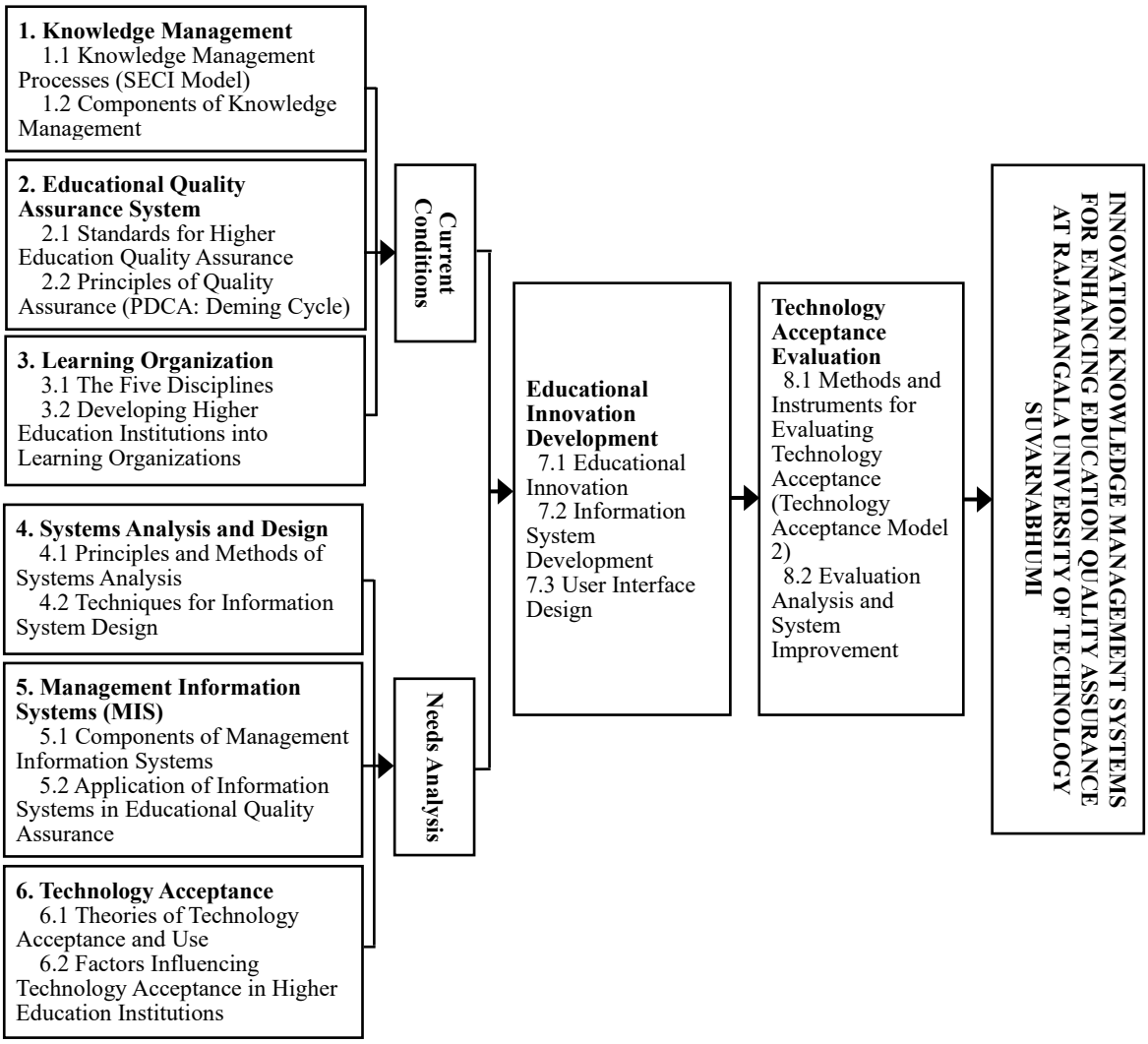

Figure 1 Conceptual Framework of the Study

Based on a comprehensive synthesis of theoretical and empirical research, a conceptual framework was developed to guide the design of an innovative knowledge management system (KMS) for educational quality assurance at Rajamangala University of Technology Suvarnabhumi (RMUTSB). This integrative framework draws upon multiple theoretical perspectives. Nonaka and Takeuchi's (1995) knowledge

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creation theory and Senge's (1990) learning organisation model inform the cultivation of a knowledge-sharing culture for continuous institutional improvement. Deming's (1986) PDCA cycle underpins the iterative processes of quality enhancement, aligning with empirical findings by Seamsamak and Rathachatranon (2015) and Nakarin Sakhon et al. (2023), who stress the importance of inclusive participation in quality assurance. User-centred system design, advocated by Kendall and Kendall (2019) and Dennis et al. (2015), is supported by MIS frameworks (Laudon & Laudon, 2020; O'Brien & Marakas, 2011) and highlights the need for integrated information systems in higher education. Technology adoption is addressed through the Technology Acceptance Model (Davis, 1989), the Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003), and Abdullah and Elias's (2022) TOE-based study, emphasising technological, organisational, and environmental factors. Innovation theories by Rogers (2003) and Fullan (2007), along with Meekhobtong et al.'s (2022) application of design thinking, reinforce the value of creative competencies such as storytelling and critical thinking. Critical success factors identified by Somjai et al. (2024) and Djangone (2022)-leadership, HRM, organisational learning, and IT-are recognised as essential for sustainable KMS implementation. Finally, user acceptance and system impact are evaluated through models by Venkatesh and Davis (2000) and DeLone and McLean (2003), consistent with Chantarasombat's (2009) emphasis on systematic review and integration. This conceptual model positions RMUTSB to craft a dynamic, participatory, and technologically adaptive KMS that evolves through feedback, cross-unit collaboration, and shared leadership to ensure enduring institutional impact.

Methodology

This mixed-methods research design aimed to combine quantitative and qualitative approaches, structured into four phases. The first examined the current knowledge management system for educational quality assurance.

Step 1: Assessing the Current State of the Knowledge Management System for Educational Quality Assurance: This initial phase of the study, titled The Development of an Innovative Knowledge Management System for Educational Quality Assurance at Rajamangala University of Technology Suvarnabhumi (RMUTSB), employed a quantitative approach to assess the current state of the university's quality assurance system. Data were gathered from 300 personnel directly engaged in quality assurance activities, including coordinators, officers, and administrators, selected from a total population of 895 using Krejcie and Morgan's sampling table and stratified random sampling to ensure representativeness across roles and campuses (Creswell, 2014). The structured questionnaire, grounded in theoretical and empirical frameworks on knowledge management (KM), educational quality assurance, and information systems, comprised 30 Likert-scale items across four domains: leadership support, KM processes, organisational culture, and IT utilisation, alongside open-ended items for additional feedback. Instrument validity was confirmed through expert review with Item-Objective Congruence (IOC) scores ranging from 0.60 to 1.00 (Rovinelli & Hambleton, 1977), and reliability testing yielded a Cronbach's alpha of 0.921 (George & Mallery, 2003). Data collection spanned four weeks via both online and paper-based formats, preceded by informed consent and supported by departmental coordination. Quantitative analysis was conducted using Jamovi software (Version 2.3), applying descriptive statistics, t-tests, one-way ANOVA, Levene's test, and Scheffé's post-hoc comparisons. These findings provided a foundation for identifying system strengths and weaknesses across demographic subgroups, guiding the subsequent design of an innovative, context-sensitive knowledge management system tailored to RMUTSB's institutional environment.

Step 2: Needs Analysis of the Knowledge Management System for Educational Quality Assurance: Following an assessment of the current knowledge management system (KMS) supporting educational quality assurance at Rajamangala University of Technology Suvarnabhumi (RMUTSB), this qualitative phase aimed to explore stakeholders' experiences, perspectives, and expectations to inform a more responsive and innovative system design. Grounded in Strauss and Corbin's (1998) grounded theory

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methodology, the study employed a contextualised lens to capture the complexity of KM systems, recognising that quantitative methods alone cannot fully address the human and situational intricacies involved. Six purposefully selected key informants-including senior administrators, curriculum coordinators, instructors with self-assessment reporting experience, and quality assurance officers-were chosen based on their extensive experience and capacity to provide deep analytical insight, following Patton's (2002) guidance on information-rich cases. Data were collected using a semi-structured interview guide, validated through expert review (content validity index: 0.67-1.00; overall index: 0.91) and refined via pilot testing. Interviews, conducted in person and virtually, were recorded with consent, transcribed, and thematically analysed using qualitative software through open coding, categorisation, and theme identification, with member checking and triangulation ensuring trustworthiness. Thematic analysis revealed seven key stakeholder-driven requirements for an optimal KMS, including the need for a centralised, integrated data repository, advanced technologies such as AI and big data to foster internal knowledge communities, and continuous performance assessment to support adaptive innovation. These findings echo Somjai et al. (2024), who highlighted leadership, technological support, organisational culture, and staff engagement as critical success factors in KM implementation. Additionally, participants identified major limitations in the existing system, including fragmented databases, redundant processes, ambiguous criteria, and a disconnect between institutional policy and operational execution-issues central to the system's next developmental phase.

Step 3: Design and Development of the Knowledge Management System for Educational Quality Assurance: Following the analysis of stakeholder insights, the researchers proceeded to design an innovative knowledge management system (KMS) tailored to the specific needs of Rajamangala University of Technology Suvarnabhumi (RMUTSB), addressing limitations identified in prior phases through an iterative, user-centred process. Anchored in qualitative inquiry and guided by a human-centred design approach, this phase emphasised end-user involvement in defining problems, identifying core functionalities, and shaping system architecture, aligning with Meekhobtong et al. (2022), who emphasised listening deeply to users as the foundation of effective innovation. Twelve participants-including policy implementers, administrators, officers, quality assurance and KM experts, and students-were purposively selected for their experience, insight, and active roles. A focus group discussion, structured using Krueger and Casey's (2015) framework, explored four thematic domains: current system constraints, desired KMS features, essential functionalities, and long-term sustainability factors. Expert validation yielded strong content validity indices (0.67–1.00; M = 0.78), and a pilot test ensured clarity and sequencing. A 90-minute semi-structured session (in person and online) included a briefing, facilitated dialogue, and synthesis, with informed consent, audio recording, and note-taking. Qualitative analysis involved coding participant quotes to extract key themes, such as "centralised database", "system flexibility", and "predictive analytics", and mapping them onto the broader conceptual framework. Results culminated in a proposed KMS model featuring five integrated components: (1) a centralised database powered by artificial intelligence, big data, and cloud computing; (2) responsive core functions including real-time analytics and continuous monitoring; (3) built-in evaluation and iterative improvement mechanisms; (4) a collaborative learning platform fostering intra-organisational knowledge sharing; and (5) strategic use of data and knowledge as competitive assets. The design reflects principles of disruptive innovation, emphasising adaptability, engagement, and the strategic organisation of knowledge to drive institutional quality and competitiveness.

Step 4: Evaluation of the Knowledge Management System Innovation for Educational Quality Assurance: Following the design and development of the knowledge management system (KMS) outlined in Step 3, the final phase focused on evaluating the quality and applicability of the proposed innovation. This assessment emphasised three key dimensions: alignment with stakeholder needs, institutional relevance, and overall system effectiveness, employing a survey-based quantitative methodology to ensure systematic and unbiased results. A structured questionnaire, grounded in established innovation assessment frameworks, was administered to 15 purposively selected participants representing university administrators, KM or system development specialists, faculty involved in curriculum and quality

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assurance, and departmental QA officers. Inclusion criteria required at least five years of relevant experience and active involvement in system development or evaluation. The instrument, developed from the five core components of the system-structural appropriateness, operational clarity, technological capacity, usability, and decision-making support, consisted of 25 Likert-scale items (five per component) and open-ended questions. Content validity was confirmed through expert review (IOC = 1.00), and reliability testing yielded a Cronbach's alpha of 0.947, indicating excellent internal consistency (George & Mallery, 2003). Data were collected over 14 days via online and offline formats, achieving a full 100% response rate (Tashakkori & Teddlie, 2003). SPSS analysis of means and standard deviations revealed an overall system evaluation of "high" (M = 4.29, SD = 0.43), with "system effectiveness" scoring highest (M = 4.40), reflecting readiness for institutional implementation. Open-ended feedback recommended enhanced database integration, pre-implementation training, and faculty-level support teams. Based on these findings, the researcher proposes piloting the system within the Faculty of Science and Information Technology, leveraging its technological capacity, before wider rollout. The creation of a cross-campus Knowledge Management Innovation Taskforce is also recommended to oversee implementation, support iterative improvement, and align the initiative with Thailand's Higher Education 5.0 vision, enabling streamlined data management, reduced redundancy, and sustainable quality assurance advancement.

Results

1. Findings on the Current State of Knowledge Management for Quality Assurance in Education: This part of the research aimed to evaluate the existing condition of the university's knowledge management system (KMS) regarding its role in ensuring educational quality. Gathering a foundational understanding vital for cultivating an innovation adapted to the university's context, both quantitative and qualitative methods were employed to facilitate comprehensive and in-depth data collection.

The quantitative results, dependent on responses from 276 individuals, revealed the following demographic characteristics: the majority of respondents were female (66.3%); most participants were between 30 and 39 years old (53.3%); a considerable proportion held a master's degree (66.7%); and the vast majority of respondents were curriculum coordinators or lecturers in charge of academic programs (90.2%). Generally, the prevailing knowledge management practices related to educational quality assurance were rated at a high level, signaling a solid foundation to build further novelty and improvement upon.

Table 1 Mean and Standard Deviation of the Current Conditions of the Knowledge Management System for Educational Quality Assurance, by Dimension

Dimension	Mean	Standard Deviation	Level
1. Executive Support	3.77	0.61	High
2. Knowledge Management Processes	3.68	0.59	High
3. Organizational Culture	3.50	0.56	Moderate
4. Use of Information Technology	3.33	0.59	Moderate
Overall	3.57	0.59	**High**

Note: Interpretation criteria 4.51-5.00 = Very High, 3.51-4.50 = High, 2.51-3.50 = Moderate, 1.51-2.50 = Low, 1.00-1.50 = Very Low

According to the information presented in Table 1, the present condition of the knowledge management system implemented for guaranteeing educational quality was rated at a rather elevated level on average ($\bar{x}$ = 3.57, SD = 0.59). When scrutinized by individual facet, executive backing obtained the highest typical score ($\bar{x}$ = 3.77, SD = 0.61), accompanied by knowledge administration processes ($\bar{x}$ = 3.68, SD = 0.59), both of which were considered at an elevated level. In contrast, organizational culture ($\bar{x}$ = 3.50, SD = 0.56) and the utilization of data technology ($\bar{x}$ = 3.33, SD = 0.59) were rated at a moderate level. Follow-up interviews corroborated these conclusions, highlighting that senior officials played a visible and proactive part in offering strategic guidance, notably by establishing task forces and

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communicating institutional missions through internal channels. Additional statistical analysis using a one-way analysis of variance (ANOVA) further exposed statistically significant divergences at the 05 significance level across several aspects, as exhibited in Table 2.

Table 2 Summary of One-Way ANOVA of the Current Conditions of the Knowledge Management System, by Demographic Variables

Variable	Dimension	F-value	p-value
Age Group	Knowledge Management Processes	6.723	0.000*
	Use of Information Technology	2.645	0.049*
Position	Knowledge Management Processes	4.521	0.004*
	Use of Information Technology	3.095	0.027*
	Executive Support	3.764	0.011*
	Organizational Culture	5.343	0.001*
	Overall	5.000	0.002*
Unit	Organizational Culture	2.251	0.024*
Regional Campus	Organizational Culture	3.937	0.009*

*Significant at the 0.05 level

From Table 2, it was found that age group, job position, affiliated department, and campus location significantly influenced participants' perceptions of the current state of the knowledge management system for educational quality assurance. Statistically significant differences ($p < .05$) were observed across both individual dimensions and overall evaluations. These findings support the research hypothesis that differences in personnel background factors influence perceptions of the knowledge management system within higher education institutions.

In-depth Analysis and Synthesis: The comprehensive analysis of the current knowledge management system (KMS) at Rajamangala University of Technology Suvarnabhumi (RMUTSB) yielded several important findings. First, demographic variations revealed that respondents aged 40–49 exhibited more favourable perceptions of KM, likely reflecting their greater professional experience, while administrators reported higher agreement, particularly regarding executive support and organisational culture, than operational staff, indicating a potential perceptual gap that may hinder internal alignment. Second, significant differences across departments and campus locations were observed, especially concerning cultural readiness and infrastructure, underscoring the importance of a flexible, context-sensitive system design. Third, qualitative data from interviews and focus groups triangulated these findings, with widespread agreement on the strength of executive support but concern over the lack of a standardised, centralised KM platform. Participants with over a decade of experience consistently identified fragmented IT infrastructure as a central barrier to KM effectiveness. Fourth, a SWOT analysis highlighted a strategic opportunity in leveraging emerging technologies such as artificial intelligence, big data analytics, and cloud computing advancements, well-aligned with the proposed system enhancements. Based on this synthesis, five core components were identified to guide the next phase of innovation: (1) an integrated central database for cross-departmental access, (2) modern technological solutions to address existing IT limitations, (3) system functions enabling real-time performance tracking, (4) built-in evaluation and feedback loops to close systemic gaps, and (5) a collaborative learning community platform to promote cross-unit knowledge exchange. Collectively, these insights not only capture the current system's condition but also establish a strategic foundation for designing a responsive, forward-looking KMS tailored to RMUTSB's institutional needs.

2. Stakeholder Needs Analysis for the KMS Innovation: The second research objective was addressed through in-depth interviews and focus group discussions with 18 stakeholders, including university administrators, faculty members, and quality assurance officers, to explore challenges, expectations, and essential components for a future-ready knowledge management system (KMS). Qualitative analysis revealed seven core requirements for an innovative KMS to support educational

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quality assurance: (1) an integrated, centralised database; (2) intelligent analytics to inform decision-making; (3) digital platforms enabling cross-unit knowledge exchange; (4) adoption of advanced technologies such as artificial intelligence and big data; (5) promotion of soft skills and a learning-orientated organisational culture; (6) continuous performance evaluation mechanisms; and (7) seamless integration with existing legacy systems. These identified needs reinforce earlier findings, particularly those of Somjai et al. (2024), who highlighted leadership, robust technological infrastructure, organisational culture, and user engagement as critical success factors in effective knowledge management system implementation.

Table 3 Key Stakeholder Needs for the Knowledge Management System and Critical Reflections

Identified Need	Description	Critical Analysis
1. Centralized Database and Data Integration	- A unified, standardized central database - Integration of data from all sources - Clearly structured, easily accessible categorization	Although this is a top priority, challenges remain in designing a structure that accommodates both quantitative and qualitative data. Data security and differentiated access permissions based on user roles must also be considered.
2. Data Analytics and Decision Support	- Automated data analysis and reporting - Performance benchmarking - Predictive analytics and recommendations	Overreliance on technology could risk overlooking contextual nuances of each unit. Effective decision-making requires a balance between data-driven insights and expert judgment. The challenge lies in designing tools that augment rather than replace human decision-making.
3. Knowledge-Sharing Platforms and Communities of Practice	- Online knowledge exchange spaces - Communities of Practice (CoPs) and Professional Learning Communities (PLCs) - Knowledge repositories of best practices	The challenge is not merely building platforms but fostering sustained engagement. User experience design must prioritize value creation and interaction, not just technological sophistication.
4. Advanced Technologies	- Cloud computing - AI and machine learning - Big data - Mobile applications	Adoption should not be driven solely by novelty. Sustainability, cost-effectiveness, infrastructure readiness, and staff capacity for maintenance are critical factors that must guide implementation decisions.
5. User Engagement and Organizational Culture	- Ongoing training and skill development - Culture of knowledge sharing - Recognition and reward systems	Transforming culture is a long-term, complex process that cannot rely solely on technology or training. A holistic change strategy is required, especially one that includes leadership modeling and multi-level engagement.
6. Continuous Evaluation and Improvement	- Regular, systematic evaluation - Usage analytics - Feedback-informed updates	Designing metrics that reflect the true value of the system, not just usage or satisfaction, is difficult. The focus should be on long-term qualitative outcomes and strategic impact, which often take time to measure.

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Identified Need	Description	Critical Analysis
7. Integration with Existing Systems	- Linkage with other university systems - Reducing operational redundancy	Integrating legacy systems poses technical challenges. Attention must be paid to data compatibility, information exchange standards, and structural differences. Investment may be needed for redesign or effective middleware/API solutions.

As noted in Table 3, the recognized necessities for the groundbreaking information management framework (IMS) for educational quality assurance spanned three mutually related measurements: technological infrastructure, procedure configuration, and institutional culture. These outcomes corroborate the earlier conclusions on the present condition evaluation, which showed that data innovation received the least favorable appraisal, while administrative culture fluctuated fundamentally across units and grounds.

Thematic Examination of Every Recognized Need: Stakeholder feedback during the system conceptualisation phase revealed seven indispensable attributes for a powerful knowledge management system to effectively support educational quality assurance at Rajamangala University of Technology Suvarnabhumi. Chiefly, the necessity of a centralized, merged database was emphasized to cope with the fragmented nature of existing information systems, which breed redundancy and managerial strain. One curriculum administrator highlighted the demand for a "sole fount of reality" where data from mechanisms like SAR, IQA, and AUN-QA could be unified. Secondly, members underlined the significance of a decision support system that not merely aggregates data but also cultivates actionable insights. As a senior administrator clarified, "We need a system that detects weak points and proposes how to address them." Thirdly, the invention of digital knowledge interchange platforms was widely endorsed, with proposals for peer-to-peer learning spaces and curated repositories of optimum practices. A quality assurance officer remarked that such a space for sharing SAR practices would decrease duplication and mistakes. Fourthly, stakeholders advocated adopting modern technologies, particularly big data and artificial intelligence, to enhance systemic responsiveness and align with the digital era. Fifthly, user involvement and cultural alignment were highlighted, with recommendations for capacity building, awareness campaigns, and recognition mechanisms to foster ongoing adoption. Sixthly, there was a call for built-in evaluation instruments, including a user-facing dashboard and real-time feedback channels to guide continuous progress. Finally, integration with legacy systems such as student registration, ERP, and LMS platforms was viewed as vital to prevent duplicated workloads. As one faculty member asserted, "The new system shouldn't add more work-it should connect with what's already in place." These insights collectively shaped the foundation for a sustainable, user-responsive, and future-ready KMS.

Associating Stakeholder Needs to Innovation Design: The above stakeholder needs were broken down and synthesized into five core parts of the information management framework advancement, as created in Step 3. These parts are outlined in Table 4 and serve as the establishing pillars for the framework plan, guaranteeing coordination between client desires and the structural arrangement of the advancement.

Table 4 Core Components of the Knowledge Management System Innovation Model

Identified Needs (from Stakeholder Research)	Developed System Components
Centralized Database	Integrated Knowledge Database System
Data Analytics and Decision Support	Advanced Technologies (AI / Big Data)
Platform for Communities of Practice	Professional Learning Communities (PLCs)
Feedback and User Suggestions	Continuous System Evaluation and Improvement
System Integration	Interoperability with Other University Systems

The user-centered needs analysis within the university context revealed more than just technological expectations; it highlighted a critical paradigm shift in how knowledge management must be approached

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in the digital era. The goal is no longer limited to data aggregation but must evolve into data-enabled decision-making and the transformation of the university into a collaborative learning ecosystem. As such, the knowledge management system envisioned in this research is not merely a support tool for quality assurance activities, but rather a strategic instrument-a catalyst for reshaping organizational culture and fostering sustainable institutional development.

3. Findings on the Development of an Innovative Knowledge Management System for Educational Quality Assurance at RMUTSB

3.1 Innovation Development Process Using the PDCA Framework Integrated with Design Thinking and Agile Principles

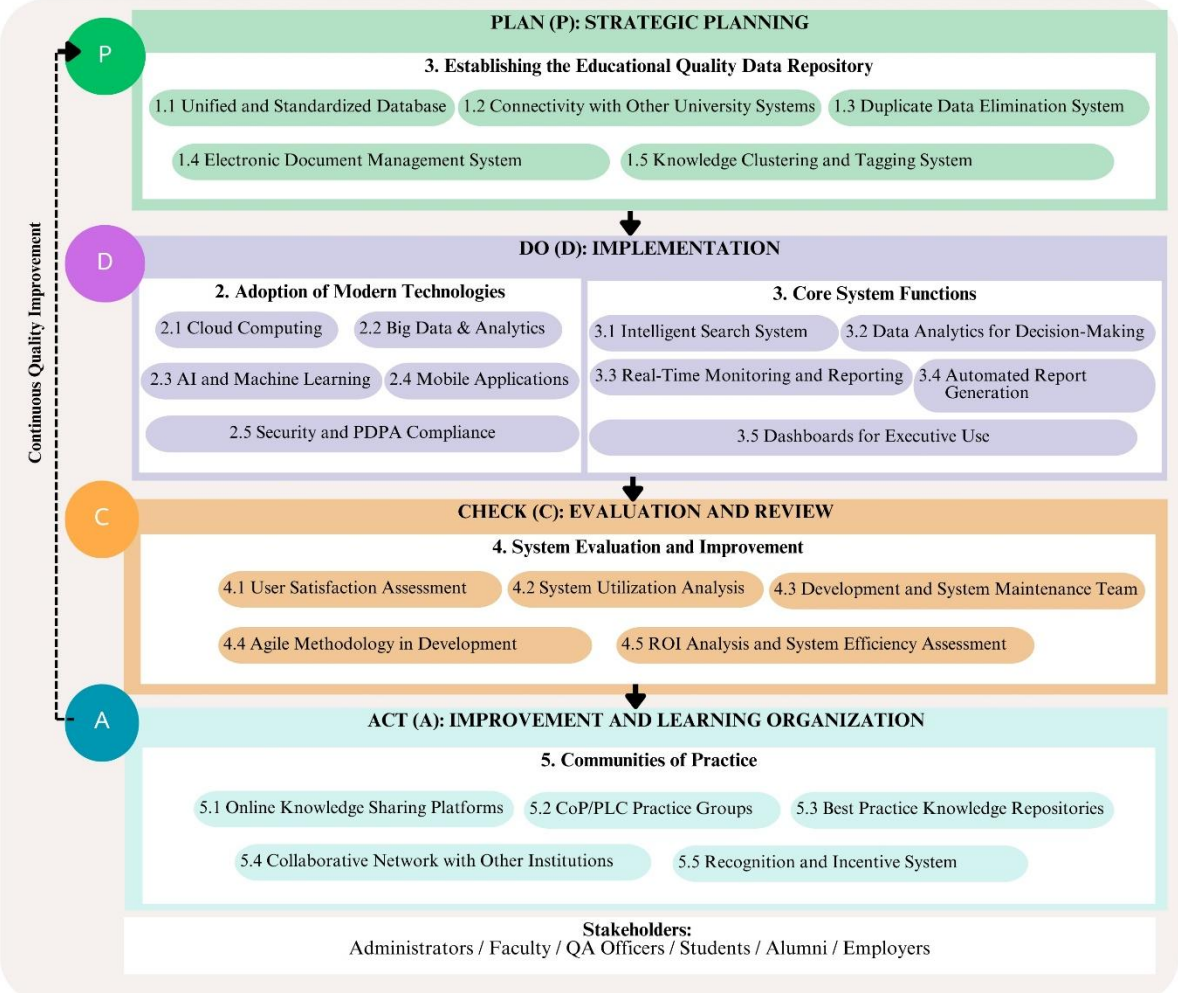

Figure 2 Innovation Framework of the Knowledge Management System for Educational Quality Assurance at Rajamangala University of Technology Suvarnabhumi

The development of the innovative knowledge management system (KMS) for educational quality assurance in this study was guided by the Plan-Do-Check-Act (PDCA) quality improvement cycle that served as the core structural framework. To ensure that the system would address authentic user needs and be tailored specifically to the context of Rajamangala University of Technology Suvarnabhumi (RMUTSB), the PDCA framework was integrated with Design Thinking, a human-centered design methodology focused on empathy and Agile Development principles.

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Design Thinking was employed to profoundly understand the user experience through extensive observation, clearly define core problems by synthesizing feedback, imaginatively generate creative solutions, rapidly build interactive prototypes, and rigorously test those prototypes with real users. This nuanced approach enabled developers to design with a genuine understanding of user expectations, moving beyond superficial assumptions solely conceived by system designers. Emphasis was placed on empathy-driven innovation, where solutions emerge from iterative cycles of deep observation, wide-ranging ideation, and rigorous testing.

Simultaneously, Agile Development was adopted to enhance flexibility in the dynamic system development process. Work was efficiently organized into short iterative cycles, or "sprints," with continuous feedback loops. User input was systematically collected and thoughtfully integrated into each productive development cycle, allowing for agile adjustments and incremental improvements. This adaptive approach minimized the risk of developing a system misaligned with user needs and allowed for tangible progress to be demonstrated in concise timeframes.

The integration of these three frameworks-PDCA, Design Thinking, and Agile-resulted in a development process that was structured yet responsive, methodical yet empathetic, and goal-oriented yet adaptive. This holistic methodology facilitated the creation of an innovative knowledge management system that is not only functionally robust but also contextually relevant and strategically aligned with the university's operational realities and cultural nuances. (As illustrated in Figure 2.)

3.2 Components of the Knowledge Management System Innovation

As illustrated in Figure 2, the structural design of the developed knowledge management system (KMS) innovation for educational quality assurance consists of five core components that are interlinked within a cyclical PDCA (Plan-Do-Check-Act) framework, with users placed at the center. Each component was specifically designed to address the contextual needs identified during the preceding research phases and integrates modern technologies with quality assurance best practices seamlessly and strategically. These components are summarized in Table 5, which outlines their alignment with the PDCA cycle and their functional descriptions.

Table 5 Core Components of the Knowledge Management System Innovation for Educational Quality Assurance

Component (Aligned with PDCA Cycle)	Details
1. Integrated Knowledge Database (Plan)	- Standardized central data repository - Interoperability with other institutional systems - Elimination of redundant data entry - Electronic document management - Clear taxonomy for knowledge categorization
2. Advanced Technologies (Do)	- Cloud computing infrastructure - Big Data and analytics integration - AI and machine learning for automation - Mobile application access - Data security and PDPA compliance
3. Core System Functions (Do)	- Intelligent search functionality - Decision-support data analytics - Real-time monitoring and reporting - Automated report generation - Executive dashboards
4. System Evaluation and Continuous Improvement (Check)	- User satisfaction assessments - Usage analytics and performance metrics - Benchmarking against set targets - Identification of improvement areas - ROI analysis and long-term impact evaluation

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Component (Aligned with PDCA Cycle)	Details
5. Learning Communities (Act)	- Online knowledge-sharing platforms - Communities of Practice (CoPs) / Professional Learning Communities (PLCs) - Repositories of best practices - Collaboration networks with other institutions - Recognition and rewards systems

These five components are designed to operate as an iterative cycle, supporting continuous and sustainable development of the knowledge management system. Rather than a one-off project, the innovation is envisioned as a dynamic and adaptive system that evolves in parallel with the institution's changing needs. The KMS innovation developed through this study comprehensively addresses the technological, procedural, and cultural dimensions of educational quality assurance. Each component corresponds to a distinct phase in the PDCA cycle, thereby fostering institutional learning, accountability, and continuous quality improvement.

3.3 Responsiveness to Stakeholder Needs

From its inception, the system was designed to resolve long-standing challenges in educational quality assurance through integrating fragmented institutional data sources and stakeholders' diverse viewpoints. The resulting solution offers a multidimensional approach, consolidating previously separated information, cutting redundant data entry, boosting accuracy, and significantly reducing administrative workload. In addition, the real-time executive dashboards now provide leadership with rapid access to analytical insights and trend analyses, allowing identification of institutional weaknesses and informed formulation of evidence-based reforms—advancing beyond static, retrospective reporting. Furthermore, the digital communities of practice encourage cross-boundary collaboration and peer sharing of expertise, minimizing duplication efforts and enhancing professional growth. Ultimately, the system's continuous refinement based on ongoing user input has developed an agile and adaptive platform with potential to evolve, aligning changing institutional needs, thereby strengthening assurance in its long-term pertinence and strategic importance.

3.4 Evaluation of the Knowledge Management System Innovation

Revealing "The new system should analyze, not just collect data" and "We need idea sharing, not just self-reports," confirmed that the innovation catalyzes cultural transformation through collaborative organizational learning beyond technology. A formal review involving 15 experts and end-users then evaluated quality, alignment, and readiness. Refinements prior to broader implementation incorporated evaluation findings, now presented in Table 6.

Table 6 Evaluation Results of the Knowledge Management System Innovation

Evaluation Dimension	Mean	Percentage	Standard Deviation	Level
1. Knowledge Management System Evaluation	4.20	84.00%	0.71	High
2. Feasibility of Implementation	4.27	85.40%	0.69	High
3. Innovation Efficiency	4.40	88.00%	0.67	High
Overall Mean	4.29	85.80%	0.69	**High**

Note: Interpretation Criteria 4.51-5.00 = Very High, 3.51-4.50 = High, 2.51-3.50 = Moderate, 1.51-2.50 = Low, 1.00-1.50 = Very Low

The evaluation of the innovative knowledge management system revealed largely favorable results, with an average score of 4.29 on a 5-point scale and 85.80% of respondents rating it positively. Effectiveness emerged as the highest-rated component, receiving a mean score of 4.40 from respondents, and was deemed effective by 88.00%. Feasibility of implementation followed closely with a mean of 4.27 and 85.40% in agreement. The system's ability to enhance educational quality assurance through

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knowledge management obtained a mean of 4.20 and 84.00% agreement. These findings validate the system's strong performance and practical preparedness. By incorporating the Plan-Do-Check-Act cycle, the innovation offers a structured institutional framework for knowledge management within the university. It advances quality assurance processes through continuous improvement, supports evidence-based decision-making, and fosters a culture of adaptability, efficiency, and sustained excellence. The integration of this proven method alongside modern technologies and user-centered design positions the system as a strategic solution scalable enough to elevate quality assurance practices across the university.

Discussion

1. Current State of the Knowledge Management System for Educational Quality Assurance: The findings uncovered that certain demographic factors notably molded perceptions of the present knowledge management system (KMS) for educational quality assurance. Age, professional role, organizational division, and campus site were statistically important variables. In contrast, gender and educational level exhibited no significant impact. This lack of gender-based differentiation implies the presence of an inclusive quality culture disregarding gender in a performance-driven environment where professional duties transcend gender distinctions.

Respondents between 40 and 49 expressed the most positive view of the KMS, aligning with Erikson's theory that middle-aged adults are intrinsically motivated to teach younger generations and share their accumulated knowledge and experience. Similarly, Knowles' concept of adult learning supports the notion that life experiences benefit adult learners in applying knowledge. These conclusions might also be interpreted through a generational lens, where Generation X professionals often prefer structured and overt forms of knowledge management over implicit styles.

Of all roles, executives displayed more favorable perceptions than frontline staff, particularly quality assurance officers. This signals a gap in perspective between leadership and operational levels, aligning with Schein's organizational culture theory, highlighting discrepancies between ideals and practical values. It also supports the idea of knowledge leadership that underscores a leader's role in envisioning and cultivating a culture embracing knowledge creation.

These findings echo Seamsamak and Rathachatranon's (2015) research, which found that while Kasetsart University personnel had strong quality assurance awareness, perceptions of effectiveness varied minimally across individuals. This suggests a shared commitment to educational quality within the institution, even if process views diverge by role or experience.

The study uncovered four principal stakeholder needs for developing the knowledge management system: a fully integrated system, advanced analytics and intelligent data presentation, an accessible and participatory design, and a collaborative knowledge-sharing platform. These needs correspond closely with Nonaka and Takeuchi's (1995) SECI model of knowledge creation, describing knowledge transformation through tacit and explicit knowledge's dynamic interplay via socialization, externalization, combination, and internalization.

The demand for collaborative platforms also reflects Wenger's (1998) concept of Communities of Practice, where practitioners learn through interaction and shared experience. Chantarasombat (2009) successfully applied such principles in Thai higher education, identifying them as critical drivers of institutional knowledge growth. The findings likewise mirror Sungrugsa et al. (2018)'s Professional Learning Community framework, where educator and staff groups collaborate through reflective practice, classroom-based inquiry, and joint innovation, all contributing to a sustainable quality culture.

Similarly, Vehachart (2018) highlighted that Professional Learning Communities provide a trusted professional space for continuous exchange, strengthening collegial bonds and reducing professional isolation-key conditions for cultivating true learning organizations. Therefore, integrating Professional Learning Community principles into the knowledge management system innovation addresses not only technological and management needs but also cultural transformation within the institution.

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The emphasis on organizational culture and leadership parallels open innovation frameworks that stress integrated learning across boundaries and continual improvement cycles. Together, these perspectives justified the iterative, collaborative design process utilized in this research.

Furthermore, these discoveries align with prior examinations identifying critical determinants for knowledge management success: developing human assets, visionary leadership, organizational acumen, and technological synergy. When adequately addressed, these factors markedly influence performance and strategic planning, particularly approaches to learning and unified systems, lending support to the participative digital platforms and coordinated technologies central to the present study.

2. Stakeholder Needs for Knowledge Management Innovation: The findings uncovered four primary desires of those involved for an effective system to manage knowledge (KMS): (1) a fully integrated and synchronized platform, (2) state-of-the-art examination and insightful visual presentations of data, (3) an easy-to-use and inclusive structure, and (4) a collaborative area for sharing what is known. These demands closely follow the SECI model of knowledge evolution proposed by Nonaka and Takeuchi (1995), which depicts knowledge transformation as a lively interplay between implicit and explicit knowledge through four major steps: socializing, externalizing, combining, and internalizing. The stakeholder-inspired focus on collaboration, accessibility, and intelligence mirrors the fundamental prerequisites for permitting continuous knowledge conversion and organizational learning within institutions of higher education. Interestingly, the research also highlighted the need for a dynamic approach that stimulates discussion and advances thinking on complex topics. While integration and unification are important, participants valued a diverse range of perspectives and lengths of contribution.

The demand for collaborative platforms also echoes Wenger's (1998) concept of Communities of Practice (CoP), in which practitioners learn through interaction and shared experience. Chantarasombat (2009) successfully applied CoP principles in Thai higher education, identifying them as critical drivers of institutional knowledge development. The findings also reflect the Professional Learning Community (PLC) framework articulated by Sungrugsa et al. (2018), where groups of educators and staff collaborate through reflective practice, classroom-based inquiry, and joint innovation, all contributing to a sustainable quality culture.

Similarly, Vehachart (2018) highlighted that PLCs offer a trusted professional space for continuous exchange, building collegial bonds, and reducing professional isolation-key conditions for cultivating true learning organizations. The integration of PLC principles into the KMS innovation, therefore, addresses not only technological and managerial needs but also cultural transformation within the institution.

The emphasis on organizational culture and leadership parallels Chesbrough's (2003) concept of Open Innovation, which promotes external knowledge integration and feedback loops, as well as Deming's quality improvement cycle, which underpins sustained system development. Together, these frameworks justify the participatory, iterative design approach taken in this study.

Furthermore, these findings align with Somjai et al. (2024), who identified four Critical Success Factors (CSFs) in knowledge management: human resource management, leadership, organizational learning, and information technology. These CSFs significantly influence organizational performance and strategy, particularly learning strategies and system integration, further validating the emphasis on participatory platforms and technological synergy in the present study.

3. Development of the Knowledge Management System Innovation: The knowledge management system (KMS) innovation developed in this study was guided by applying the continuous quality improvement cycle of plan, do, check, act, integrated with modern digital technologies. A defining characteristic of the innovation lies in its emphasis on online knowledge-sharing spaces intended to cultivate communities of learning within the university. This approach aligns with Chantarasombat's (2009) identification of knowledge centers as mechanisms pivotal for facilitating communities of practice. These hubs coordinate, foster dialogue, collaboration, and institutional memory regarding quality assurance in higher education.

Beyond merely the communities of practice framework, the system was also designed consistently with the Professional Learning Community model, amplifying both professional growth and organizational culture. Narint Sangkaraksa (2018) notes that Professional Learning Communities bring together educators, administrators, and staff to reflect jointly on practice, engage in goal-oriented discussion, and spur continuous academic betterment. Within this structure, instructors assume leadership roles in knowledge generation and take ownership of their work processes through reflective inquiry and data-informed action.

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This vision is further supported by Vehachart (2018), emphasizing that Professional Learning Communities provide a collaborative space grounded in mutual trust, voluntary participation, and shared values and principles resonant with higher education institutions' collaborative, non-hierarchical culture. By integrating Professional Learning Community principles into the KMS innovation, the knowledge-sharing platform evolves beyond a communication tool to become a space for professional empowerment, organizational learning, and the co-creation of shared responsibility for quality.

The system was developed to be highly adaptable, permitting contextual customization by distinct departments or regional campuses while upholding a centralized standard. This flexible yet standardized architecture corresponds to Chesbrough's (2003) theory of Open Innovation, advocating the inclusion of multiple stakeholders in system development and decision-making.

Additionally, the design aligns with Senge's (1990) concept of the Learning Organization, emphasizing continuous learning to bridge knowledge gaps and reduce skill disparities. Compared to Chantarasombat's (2009) earlier model focusing on knowledge management for educational quality at Mahasarakham University, the current study advances the field by integrating emerging digital technologies, including cloud computing, big data analytics, and artificial intelligence, to reflect 21st-century users' needs.

The findings also align with Meekhobtong et al. (2022), underscoring the importance of digital storytelling as a means of fostering innovation and knowledge sharing in higher education. They identified digital narrative skills, creative thinking, and critical thinking as key components, which can be cultivated through design thinking processes, including problem exploration, data gathering, ideation, prototyping, and presentation. These methodologies were directly applied in this study to engage stakeholders in co-developing the KMS innovation, allowing for the continuous exchange of exemplary practices via digital platforms.

4. Critical Success Factors in Knowledge Management for Educational Quality Assurance: The findings of this study revealed several key factors that contributed to the successful development of the knowledge management system (KMS) for educational quality assurance. These included the leadership of the researcher, participants, and university administrators; early and continuous stakeholder engagement; experiential learning processes; and collaborative support mechanisms. These findings are consistent with Chantarasombat (2009), who identified the critical success factors for knowledge management in community-based organizations as including participants' enthusiasm for learning, leadership from researchers and participants, collaborative work capability, participatory environments, learning-by-doing methods, and operational mechanisms driven by centralized knowledge management centers.

In alignment with Senge's (1990) theory of learning organizations, the creation of shared vision involves the collective articulation of ideas, worldviews, and knowledge within the organization to establish a core vision. All members should be involved in shaping that vision and imagining the organization's future. This aligns with the current study's finding that participatory engagement from the outset, through joint ideation, planning, implementation, monitoring, and shared responsibility, fostered a positive work environment and led to greater ownership, initiative, and sustained commitment among participants. Such involvement proved instrumental in improving coordination, enhancing continuity, and encouraging self-directed engagement.

Moreover, these findings also correspond with the concept of Professional Learning Communities (PLCs). According to Sungrugsa et al. (2018), PLCs are effective mechanisms for driving organizational knowledge and quality, where shared learning, reflective practices, and continuous communication based on real experiences are emphasized. PLCs stress deep participation by all staff levels and foster collective ownership of institutional change and quality enhancement.

Similarly, Vehachart (2018) emphasized that effective PLCs require distributed leadership, the cultivation of organizational trust, and a culture of open communication and deep listening. These elements are critical to sustaining knowledge management and advancing educational quality assurance over the long term. Hence, the success factors found in this study do not merely align with traditional knowledge management theories but are also enriched by the PLC framework, which promotes a culture of organizational learning, continuous quality improvement, and genuine stakeholder participation.

These findings are also reinforced by the work of Somjai et al. (2024), who found that leadership and organizational learning are key success factors that significantly influence organizational performance. Their research underscored the importance of both the learning perspective and the integration perspective

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in driving change and fostering a learning culture. These insights are consistent with the present study, which highlights leadership, collaborative culture, and institutional learning as integral components of successful and sustainable knowledge management for educational quality assurance.

Policy and Practical Recommendations for Improvement: Based on the study's findings, a set of strategic and practical recommendations is proposed to advance the development of an integrated knowledge management system (KMS) supporting educational quality assurance at Rajamangala University of Technology Suvarnabhumi (RMUTSB). Strategically, the university should establish a unified policy to harmonise information systems across departments and campuses, thereby minimising data duplication and facilitating the creation of a centralised, reliable database. The adoption of the principle "input once, use many times" would reduce administrative burdens and enhance operational efficiency. Furthermore, institutional directives should promote the formation of cross-boundary professional learning communities, supported by digital platforms, to encourage the exchange of best practices and foster inter-campus collaboration, bridging differences in perspectives and methodologies. Concurrently, the university must invest in building digital literacy and data analytics competencies among personnel at all levels, equipping staff to effectively utilise emerging technologies in knowledge management and quality assurance contexts. Practically, the system developed through this research enables staff to avoid redundant data entry, reducing workload and errors while improving data integrity and user satisfaction. Real-time dashboards offer accessible visualisations of performance metrics, empowering administrators to monitor progress, anticipate challenges, and make timely, data-informed decisions. Additionally, the integrated knowledge-sharing platform supports peer learning and the dissemination of good practices across faculties and campuses, contributing to the cultivation of a consistent and continually improving quality culture university-wide.

Benefits for Students: The implementation of the innovative knowledge management system (KMS) for educational quality assurance at RMUTSB presents several significant benefits for students. First, it contributes to improved academic excellence by promoting more standardised, responsive curricula and pedagogical approaches that align with diverse learner needs, offering streamlined learning pathways for some while providing intellectually stimulating content for others. Second, the system facilitates access to quality-related information through user-friendly digital platforms, empowering students to engage in feedback processes and fostering a participatory educational environment where student voices are valued. Third, student involvement in the quality assurance process promotes the development of digital literacy and analytical competencies, equipping learners with essential skills for success in the 21st-century workforce and civic life.

Benefits for Faculty: The innovative knowledge management system also provided substantial benefits to faculty members in numerous ways. Firstly, by reducing unnecessary paperwork and repetitive reporting, instructors gained time to dedicate to inventive lessons and scholarly research, allowing for deeper analyses and academic progression. Moreover, the platform encouraged collaborative studying by allowing participation in online communities of practice, where teachers shared successful tactics, engaged in mutual consideration, and motivated one another to consistently refine educational approaches. Thirdly, insights derived from data furnished by the system empowered faculty to judge and enhance teaching and research grounded in evidence rather than presumption, ultimately upholding higher educational benchmarks and more informed professional evolution.

Benefits for Administrators: For institutional administrators, the knowledge management system (KMS) offers transformative capabilities across multiple domains. First, real-time performance tracking through interactive dashboards provides administrators with intuitive visualisations of institutional metrics, enabling timely, evidence-based decision-making that benefits all stakeholders. Second, the system supports strategic planning by delivering detailed data and predictive analytics that inform resource allocation, policy development, and long-term institutional planning grounded in emerging trends. Third, by fostering collaboration and communication through a unified digital platform, the system promotes the cultivation of a quality-driven institutional culture, encouraging active stakeholder engagement and reinforcing shared responsibility for continuous improvement.

Conclusion

This research aims to innovatively develop a knowledge management system tailored for Rajamangala University of Technology Suvarnabhumi to bolster educational quality assurance. Three overarching goals guided this effort: 1) appraising the existing framework, 2) analyzing where upgrades

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could optimize functionality, and 3) conceptualizing a customized solution. A mixed-methods approach incorporating quantitative and qualitative data offered comprehensive insights. Key findings are as follows:

1. Presently, administrative backing (average rating = 3.77) and organized knowledge processes (3.68) characterize strengths. However, fragmented and outdated technologies hamper information sharing, scoring lowest (3.33).

2. User feedback highlighted six priority areas for retooling: centralized data hosting; analytical and decision support tools; current technologies; cultivating usage and collaboration; continuous self-assessment; and streamlining with other systems. These priorities square with innovative perspectives emphasizing synergy between advanced applications and social dynamics consistent with learning organizations focused on networked problem-solving.

3. The redesigned system synchronizes quality improvement cycles with digital tools through five interdependent modules: consolidated databases; innovative technologies; core services; perpetual self-examination; and communities of inquiry. Notably, professional learning communities encourage openness, teamwork, evidence-based leadership, and perpetual academic progress. Their principles augment dynamic structure and sustainability when applied to knowledge management.

4. Expert reviews rated the solution highly overall (average = 4.29). Its potential to boost access and retrieval speeds (4.53) affirms fit with end-user needs and practical real-world impact.

Knowledge Contributions and Theoretical Innovation

This research yields noteworthy academic additions to the realms of expertise administration (KM) and educational quality assurance (EQA) in the Thai higher learning context. It advances the theoretical discussion through the development of a novel structure that combines the Skilled Learning Community (PLC) idea with modern technology-based KM techniques and the PDCA cycle. This amalgam expands the boundaries of data in three key areas.

Challenging Uniformity in KM Systems

In contrast to past research that adopted a uniform method to KM growth, this research presents empirical proof that demographic and organizational components, together with age, professional position, division, and geographical location, significantly affect perceptions and utilization of KM methods. These findings challenge the assumption that a standardized system can meet the numerous needs of all users and spotlight the importance of adaptive and person-centered system design in higher training institutions.

Integrating Multiple Disciplines Right into a Unified KM Framework

The research presents a unique conceptual model that integrates data administration concepts, PLC practices, and digital innovation. In contrast to prior works that tend to give attention to isolated dimensions (e.g., expertise or pedagogy), this study emphasises the necessity of cross-disciplinary integration to deal with the complexity of KM within the digital period. Specifically, it highlights the role of PLC in fostering an organisational tradition of ongoing reflection, peer-based learning, and collaborative quality growth -an underutilised dimension in KM analysis.

Proposing a Contextualized, Sociotechnical Innovation for Distributed Campuses

The examinee additionally contributes by designing a KM system innovation that aligns with the social and cultural contexts of decentralised institutions. This element has barely been explored in depth in previous KM research on Thai increased training. The system promotes an ecosystem of learning that combines digital infrastructure (e.g., cloud computing, analytics, AI) with social learning mechanisms, enabling the change of each explicit data and tacit data in keeping with the SECI model proposed by Nonaka and Takeuchi (1995). This sociotechnical alignment represents an essential step ahead in guaranteeing the KM system's sustainability, scalability, and institutional relevance.

Limitations and Implications for Future Practice

Despite its significant contributions to the discourse on knowledge management (KM) and educational quality assurance in higher education, this study acknowledges several limitations. First, contextual and scope constraints arise from its focus on Rajamangala University of Technology Suvarnabhumi (RMUTSB), whose distinct institutional culture, multi-campus structure, and governance model may limit generalisability; applying findings to other contexts necessitates careful adaptation. Second, the evaluation of the developed innovation is at an early stage, and long-term impacts-such as sustained system usage, cultural shifts, and knowledge-sharing behaviours-remain unobserved, warranting future longitudinal research. Third, the rapid evolution of digital technologies, including artificial intelligence, big data analytics, and cloud platforms, challenges the system's long-term applicability and

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calls for continuous investment in infrastructure and digital capacity. Fourth, while participatory development was emphasised, achieving deep engagement across all roles and campuses remained difficult, highlighting the need for stronger mechanisms to ensure equitable participation in future implementation. Nonetheless, the study introduced a flexible and scalable KM system that integrates PDCA cycles, emerging technologies, and the Professional Learning Community (PLC) model to foster an ecosystem of reflective practice and continuous improvement. Effective implementation at the local campus level requires context-sensitive strategies that build on social capital and community-based governance, echoing the perspectives of Kaesanuch et al. (2023) on participatory local economic governance in the "new normal" and Saothongthong (2023) on community-driven learning and political empowerment.

Recommendation

1. Recommendations for Practical Application of Research Findings

1.1 Enhancing Data Integration Across Departments

The study revealed limitations in the current knowledge management system, particularly in terms of data integration between departments and the incomplete coverage of knowledge creation and sharing across all processes. It is therefore recommended that the university adopt the findings to develop a centralized knowledge management database that supports the systematic collection, linkage, and monitoring of quality assurance data at all levels. Such a system would enhance the university's capacity to track, audit, and evaluate educational quality, ultimately contributing to the elevation of academic program standards across faculties.

1.2 Developing Strategic Knowledge Management Infrastructure

Based on the finding that staff members require a knowledge management system capable of collecting, storing, and analyzing quality assurance data in a structured and strategic manner, faculties and administrative units should use the results to plan and implement the development of an integrated technological infrastructure. This includes the creation of a Centralized Database, an Electronic Document Management System (EDMS), and Real-Time Analytics Dashboards. Furthermore, the university should design tools to support knowledge creation and sharing, ensuring transparent, verifiable data governance that facilitates sustainable organizational development.

1.3 Promoting Technology Adoption and Organizational Culture

As the study indicates that the effectiveness of a knowledge management system depends heavily on user acceptance and participation, the university should invest in the professional development of staff, particularly in technology utilization and knowledge management. This should be coupled with efforts to cultivate an organizational culture that values continuous learning, collaboration, and evidence-based quality improvement. Doing so will strengthen the long-term sustainability and ownership of quality assurance practices within the institution.

2. Recommendations for Future Research

2.1 Interfacing with External Quality Assurance Systems

Integrating the system with external databases operated by national educational quality assurance agencies should be explored in future research. An interoperable framework linking institutional knowledge management systems with external systems could facilitate more efficient data exchange and better responsiveness to national and international quality standards. However, the current research primarily focused on the internal knowledge management infrastructure within the university and did not fully delve into this integration.

2.2 Exploring Behavioral Factors in System Adoption

While the developed innovation received positive evaluations regarding system quality, the study did not thoroughly address the behavioral factors influencing long-term adoption by users. Subsequently, constructs tied to innovation adoption behavior should be examined, such as perceived ease of use, user satisfaction, and leadership support. These variables are pivotal to strengthening long-term user involvement and promoting sustainable utilization of the system.

2.3 Longitudinal Evaluation of System Effectiveness

This study assessed system quality through expert review in an initial trial phase. For more robust evaluation, future studies should conduct longitudinal research to gauge the real-world effectiveness of the system in backing educational quality assurance processes. Data should be gathered over multiple academic cycles to evaluate changes in organizational behavior, knowledge-sharing practices, and

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institutional performance. Such longitudinal insights would support continuous system improvement and ensure relevance amid evolving organizational and technological contexts.

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