Jurnal Kajian Informasi & Perpustakaan Vol. 14, No. 1 (June 2026) 17-36
ISSN 2303-2677 (Print) ISSN 2540-9239 (Online)

Information management of critical knowledge in an IT consulting company

Bambang Widoyono[1*], Ristu Saptono[2], Arif Rohmadi[3], Endar Wihidayat[4], Akhmad Syaifuddin[5], Brilyan Hendrasuryawan[6]

[1,2,3]Informatics Study Program, Universitas Sebelas Maret
Jl. Ir. Sutami No.36, Kec. Jebres, Kota Surakarta, Jawa Tengah 57126
[4]Postgraduate, Curtin University
Kent St, Bentley, WA 6102, Australia
)* Corresponding Author, Email: bambangwidoyono@staff.uns.ac.id

Received: October 2025; Revised: January 2026 Accepted: January 2026; Published: June 2026

ABSTRACT

Background: Knowledge Management (KM) plays a crucial role in supporting organizational sustainability, particularly in IT consulting firms where knowledge is predominantly tacit, experience-based, and vulnerable to loss. Many consulting organizations face difficulties identifying which knowledge is truly critical and how to manage it as reusable organizational information. **Purpose:** This study aimed to identify, prioritize, and manage critical knowledge aligned with organizational strategy at PT XYZ, an IT consulting company. **Methods:** Using a mixed qualitative–quantitative approach, this study followed six stages: contextual knowledge scoping, tacit knowledge elicitation, knowledge structuring, critical knowledge assessment using Critical Knowledge Factors (CKF), prioritization using Analytical Hierarchy Process (AHP), and repository design for knowledge preservation. **Results**: The study identified 24 structured knowledge areas, of which 20 were classified as critical. AHP analysis indicated that Gaining Commitment, Reading Opportunities, and Marketing Strategy were the highest priority knowledge assets, primarily embedded in sales and marketing activities. **Conclusion:** This study demonstrates how tacit knowledge can be transformed into structured organizational information aligned with strategic processes through an information management perspective. Theoretically, this study contributes to information science by conceptualizing critical knowledge as information objects organized through metadata, lifecycle governance, and repository preservation. **Implications**: In practice, these findings provide the IT consulting firm with a structured approach to safeguarding critical tacit knowledge, reducing reliance on individuals, and strengthening organizational memory. However, the study is limited to a single organizational context, relies on expert judgment, and presents a repository design that remains conceptual rather than technically implemented.

Keywords: Knowledge management; Critical knowledge; Organizational memory; Knowledge repository; Analytical hierarchy process

INTRODUCTION

We all know that today's business world is rapidly changing and highly competitive. Bloem and Salimi state that effective knowledge management (KM) helps organizations make better decisions, build stronger capabilities, and sustain long-term competitiveness (Bloem &

doi: http://doi.org/10.24198/jkip.v13i2.67577

Salimi, 2023; Mirafzal et al., 2023; Rosário & Raimundo, 2024). Other research shows that many IT consulting firms rely heavily on tacit, contextual, and difficult-to-document experiential knowledge, thereby risking its loss when key individuals leave the organization (Bode et al., 2022; Sahibzada & Mumtaz, 2023). Failure to manage information and document critical knowledge limits the organization's ability to implement sustainable knowledge management (Edwards, 2022; Rosário & Raimundo, 2024). The problem is further complicated by the lack of a systematic mechanism to identify and prioritize knowledge that truly has strategic impact (Chen et al., 2022; Rahman et al., 2021).

To understand how these challenges emerge and impact organizational information management practices, the company needs an empirical study that reflects these conditions. Therefore, this research focused on PT XYZ as the case study context. The researchers have chosen PT XYZ because it represents the general characteristics of IT consulting firms that still rely on individual expertise and lack a structured knowledge management system. This condition makes PT XYZ a relevant empirical context for examining how critical knowledge can be managed, documented, and aligned with organizational strategy.

Previous studies on knowledge management (KM) in consulting firms have generally focused on knowledge mapping or knowledge sharing practices, without adequately explaining the criticality of that knowledge. This makes it challenging to determine which knowledge should be prioritized in organizational information management (Edwards, 2022; Mendes et al., 2020). Other studies have examined KM adaptation in the dynamic environment of consulting firms but have not fully integrated the organization's business strategy with the critical knowledge identification and prioritization process (Mirafzal et al., 2023; Patel et al., 2023). To address this remaining research gap, it is necessary to manage critical tacit knowledge aligned with organizational strategy through a documented, sustainable information management approach.

Although there is some research on knowledge management in consulting firms, most prior work emphasizes knowledge sharing and mapping practices without detailing how critical knowledge is systematically identified, prioritized, and preserved in line with organizational strategy. Furthermore, existing studies rarely integrate information management principles, treating critical knowledge as an information object requiring documentation, governance, and lifecycle preservation. This gap limits an organization's ability to manage and sustain critical tacit knowledge on an ongoing basis.

In this study, knowledge is understood as contextualized human understanding derived from experience, while information is knowledge that has been structured, represented, and communicated. When such structured knowledge is documented with metadata, governance rules, and preservation mechanisms, it becomes an information object in the domain of information science.

Based on these problems, this study has several objectives: first, to identify critical tacit knowledge aligned with organizational strategy in an IT consulting firm; second, to assess and prioritize such

knowledge using the Criticality of Knowledge Factor (CKF) and the Analytic Hierarchy Process (AHP); and third, to design an information management-based knowledge repository that supports long-term knowledge preservation and reuse. This study examines three main variables: knowledge management (KM), critical knowledge (CK), and the organization's core activities and strategies. KM refers to the structured processes through which an organization acquires, processes, shares, and applies knowledge to enhance performance (Yazdani et al., 2020). Foundational studies in knowledge management emphasize that organizational knowledge must be systematically captured, shared, and embedded in organizational processes to avoid dependence on individuals (Alavi & Leidner, 2001; Davenport & Prusak, 1998). CK comprises the essential knowledge that directly contributes to organizational success. CK is not only an individual expertise but also an information entity that can be documented, structured, and preserved in organizational information systems. Researchers evaluate CK using the Criticality of Knowledge Factor (CKF), which measures elements such as rarity, usefulness, and tacitness (Ermine et al., 2006; Tanjung & Sensuse, 2024). To understand an organization's core activities and core business strategy, this study uses the Business Model Canvas (BMC) and Value Chain Analysis as analytical frameworks (Peppard & Ward, 2004; Smith & Johnson, 2021). The Business Model Canvas helps identify an organization's core activities, key resources, and value propositions that underpin its business strategy (Gaimon & Ramachandran, 2021). Value Chain Analysis is then used to decompose primary and supporting activities into their contributions to value creation and to the organization's competitive advantage (Wilms et al., 2020).

From an information science perspective, BMC and Value Chain Analysis are used not only as strategic management tools but also as analytical instruments to identify information-intensive activities, knowledge dependencies, and critical points where tacit knowledge needs to be documented and preserved as valuable information for the organization (Bode et al., 2022; Orero-Blat et al., 2021). Furthermore, this study employed the Analytic Hierarchy Process (AHP) to prioritize CK through managerial pairwise comparisons, thereby establishing a quantitative link between knowledge importance, business strategy, and operational focus. From an information science perspective, this study extended knowledge management research by framing critical tacit knowledge as an information entity that must be systematically organized, documented, and preserved through the principles of the information life cycle, organizational memory, and knowledge repository structures.

RESEARCH METHODS

This study employed a mixed-methods qualitative-quantitative research design, treating organizational knowledge as an information asset that must be systematically captured, structured, stored, reused, and maintained. The mixed-methods approach was chosen because identifying critical knowledge in IT consulting firms requires qualitative exploration of tacit knowledge embedded

in human experience (Edwards, 2022). Calculation of choice weights used quantitative methods to support managerial decision-making (Tavana et al., 2023). Several studies emphasize that qualitative methods are essential for uncovering experiential and contextual knowledge (Wilms et al., 2020), while quantitative methods are necessary to ensure transparency, comparability, and rigor in the prioritization process (Singh & Pradhan, 2024).

This research was conducted in six sequential stages. Each stage referred to the principles of the information life cycle. These stages include: (1) Determining the Scope of Contextual Knowledge (Information Audit), (2) Tacit Knowledge Elicitation, (3) Knowledge Structuring & Information Organization, (4) Critical Knowledge Assessment, (5) Prioritization & Validation, (6) Knowledge Repository Design & Preservation. The life-cycle-based approach enables organizations to determine which information should be retained, updated, or archived, thereby supporting the sustainability of organizational memory (Smallwood, 2021). Figure 1 depicts all steps carried out in this research.

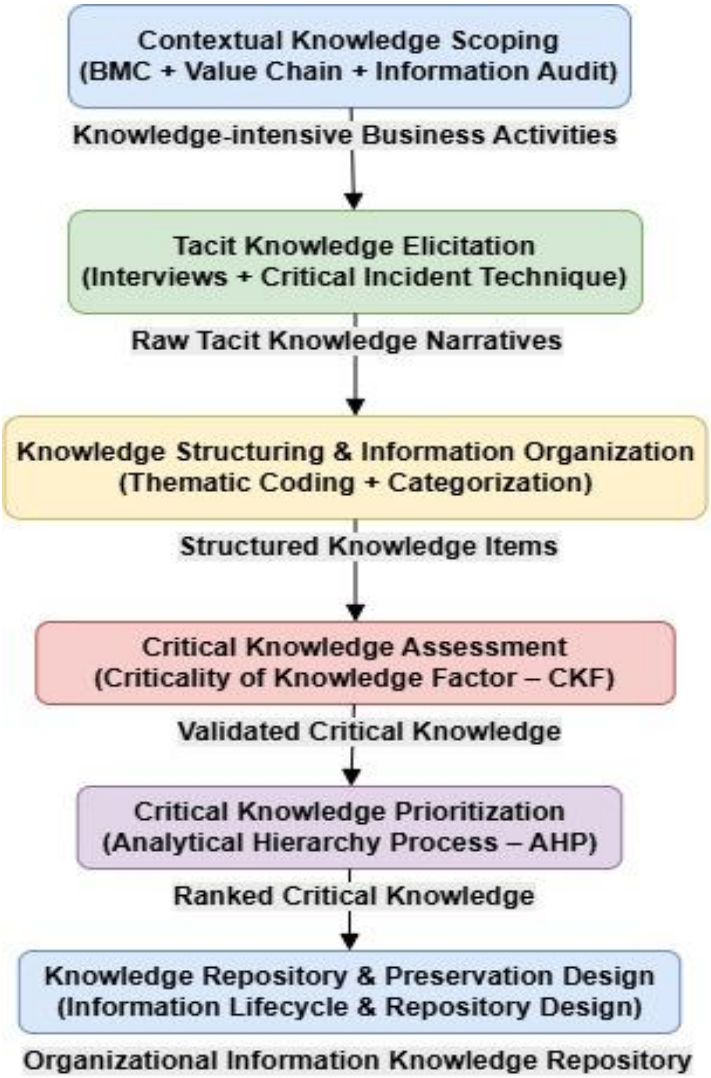

Figure 1. Research flow diagram
Source: Processed by Author, 2025

The first step was to define the scope of contextual knowledge, which served as an information audit by analyzing the company's core business activities. The BMC and Value Chain Analysis are used to ensure that the identified knowledge aligns with the company's core value-creating activities (Elia et al., 2024). This step is crucial because the information management literature emphasizes that knowledge must be contextualized within organizational functions to be meaningful and sustainably managed (Wilms et al., 2020). The outcome of this stage was a collection of knowledge-intensive business activities.

The second stage was elicitation, exploring tacit knowledge through semi-structured interviews. Interviews are the most appropriate method for capturing personal, experience-based tacit knowledge (Edwards, 2022). To ensure the credibility, relevance, and stability of the tacit knowledge obtained from the interviews, two criteria were established for potential interviewees. First, participants must be directly involved in core business activities identified in the previous stage through the BMC and Value Chain analysis. This criterion is necessary because tacit knowledge develops through repeated engagement with specific tasks and workflows, making role relevance crucial for knowledge acquisition (Rahman et al., 2021). Second, participants must have at least three years of work experience in each division. We used a sample of three informants per division, except at the managerial level. In total, 21 informants participated in the interview process. Previous research shows that tacit knowledge matures over time through accumulated practice and reflection, and individuals with shorter tenure often possess fragmented or procedural knowledge rather than in-depth experiential understanding (Edwards, 2022). The output of this stage was raw qualitative data representing narratives of tacit knowledge.

In the third stage, we structured and organized knowledge by transforming tacit knowledge extracted from interviews into explicit, structured information units. Thematic coding was used to group similar knowledge expressions into standardized knowledge categories. Other research emphasizes that knowledge must be structured and systematically represented to enable storage, retrieval, and reuse (Yates & Paquette, 2020). This process is further supported by research showing that unstructured knowledge cannot function as an organizational information asset (Smiraglia, 2021). The outcome of this stage was a table that categorized structured organizational knowledge. Researchers conducted the coding and review process collaboratively to ensure consistency and agreement across knowledge categories. The coding results were discussed iteratively among the researchers until consensus was reached regarding category boundaries and knowledge definitions, ensuring conceptual consistency across the dataset. This iterative coding and consensus-based review process enhances analytical reliability and reduces individual researcher bias, consistent with qualitative validity practices in knowledge management and information science research (Smiraglia, 2021). Table 1 presents a template for coding narrative interview data thematically and transforming it into standardized knowledge units that can be treated as organizational information assets.

Table 1
Knowledge Categorization

Column Attribute	Desription
Knowledge Code	A unique identifier assigned to each knowledge unit generated through the coding process
Raw Tacit Knowledge Statement	A condensed excerpt from interview transcripts representing tacit knowledge narratives
Knowledge Category	The thematic category resulting from the coding and classification of similar knowledge expressions
Related Business Activity	The core business activity associated with the knowledge item, derived from BMC and Value Chain analysis

Source: Result of Coding Process, 2025

The fourth stage involved a Critical Knowledge Assessment using the Knowledge Criticality Factor (CKF). The CKF is chosen because it is specifically designed to identify strategically valuable and vulnerable knowledge through dimensions such as rarity, utility, and difficulty of capture (Ermine et al., 2006). The assessment and validation process at this stage was carried out at the managerial level within each division or activity source to ensure that the identified critical knowledge reflected the organization's strategic priorities and impact. Previous research states that knowledge asset validation should involve individuals responsible for governance and strategic alignment, as they are best positioned to assess its impact on the organization in line with its strategy (Smallwood, 2021). Each CKF dimension was operationalized using a five-point Likert scale to enhance transparency and comparability. The involvement of managerial-level experts in this assessment ensures content validity, as individuals responsible for strategic decision-making are best positioned to evaluate the organizational impact and vulnerability of knowledge assets (Edwards, 2022; Smallwood, 2021). This study classifies knowledge as critical when its aggregate CKF score exceeds the organizational average, as relative thresholding is commonly used in critical knowledge studies to reflect strategic priorities and contextual differences across organizations (Onofre & Teixeira, 2022). Therefore, the use of the organizational average as the CKF threshold in this study should be interpreted as a context-specific governance decision rather than a universally generalizable methodological standard.

The fifth stage was the prioritization of critical knowledge using the Analytical Hierarchy Process (AHP) to support managerial decision-making through pairwise comparisons. A pairwise comparison matrix was constructed by comparing each critical knowledge item (CK1, CK2, …, CKn) with one other item. The logical consistency of expert judgments is evaluated using the consistency ratio (CR), and only matrices with CR values below 0.10 are accepted for further analysis, indicating an acceptable level of consistency in the pairwise comparisons (Saaty, 2002, 2012). Matrices that did not meet the consistency threshold were revised following additional discussion

with decision-makers. AHP is chosen because it provides a systematic and transparent method for ranking multiple knowledge items based on expert judgment (Tavana et al., 2023). The selected informants were all managers in each division who had worked at PT XYZ for more than 5 years. Four managerial-level decision-makers conducted pairwise comparisons, each completing an individual comparison matrix. These individual matrices were aggregated into a single group decision matrix using the geometric mean, in accordance with standard AHP procedures. This approach is supported by several studies that emphasize the importance of collective expert judgment in prioritizing knowledge assets (Edwards, 2022; Smallwood, 2021; Tavana et al., 2023; Wilms et al., 2020).

In the final stage, prioritized critical knowledge was mapped into a structured documentation format, supported by metadata and appropriate access controls, for a digital knowledge repository. Katuu states that repositories are crucial for preserving organizational knowledge and supporting long-term reuse (Katuu, 2020). Within the information lifecycle principle, critical knowledge must be ensured to remain accessible, reliable, and sustainable over time (Wilms et al., 2020). The outcome of this stage was a conceptual design for an enterprise knowledge repository that supported information preservation and organizational learning, rather than the technical implementation of an information system.

RESULTS AND DISCUSSION

The first stage aimed to identify the knowledge-intensive activities by analyzing the company's core value-creating activities. BMC and Value Chain Analysis were applied as information audit instruments to determine where knowledge was embedded. The BMC of PT XYZ is described in Figure 2.

<table>
<tr><th colspan="2">Infrastructure Management</th><th>Product</th><th colspan="2">Customer Interface</th></tr>
<tr><th>Key Partners</th><th>Key Activities</th><th>Value Propositions</th><th>Customer Relationships</th><th>Customer Segments</th></tr>
<tr><td rowspan="4">• Microsoft,
• Altova,
• Fujitsu
• Subcon Company in ICT</td><td>• Product Development,
• Sales & Marketing
• Product Delivery
• Service & Support</td><td rowspan="4">An innovative and trusted technology service in an effort to help other companies to gain a competitive advantage that can be achieved through the implementation of IT and or SI.</td><td>• Customer Support Sustainable
• Discount & promo
• Provides feedback & Asessment</td><td rowspan="4">All segments of the organization's industry or companies wish to implement IT/SI. For example, Bank Industry, Finance, Education, and other types</td></tr>
<tr><td>Key Resources</td><td>Distribution Channels</td></tr>
<tr><td>• Product Development Team,
• Software,
• Sales Team,
• Project Team</td><td>• Company Website
• Direct Sales,
• Recommendations from partner companies
• Banking and financial community forums</td></tr>
<tr><td colspan="2"></td></tr>
<tr><th colspan="2">Cost Structure</th><th colspan="3">Revenue Streams</th></tr>
<tr><td colspan="2">•Salaries and Incentive
•Marketing Activities
•Cost of increasing IT/SI knowledge
•Operational</td><td colspan="3">• Revenue from product license sales resulting from IT/SI implementation in customers
• Revenue from sales of services and support products, services or ideas in the implementation of software / IT / SI to customers</td></tr>
</table>

Figure 2. PT XYZ Business Model Canvas
Source: PT XYZ BMC, 2024

BMC covered the key activities of PT XYZ, namely service & support, sales & marketing, project delivery, and product development. The key resources were the product development team, the product delivery team, and the sales team. The Value Chain of PT XYZ contained two activities: primary and supporting. Primary activities included: service & support, sales & marketing, project delivery and IS/IT product development. Supporting activities included: facilities & operations, human resource management, and administration & legal management. The value chain of PT XYZ is described in Figure 3.

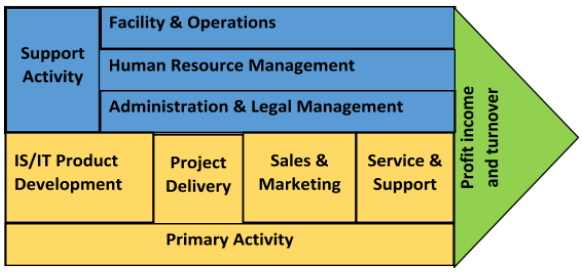

Figure 3. Value Chain of PT XYZ
Source: PT XYZ Value Chain, 2024

By linking knowledge to formal organizational activities, organizations built a stable foundation for systematic documentation and preservation that aligned with their strategy and core business. These results confirmed that organizational knowledge was embedded in activities directly related to value creation.

Based on the context-mapping results from the previous stage, semi-structured interviews were conducted with informants directly involved in strategically valuable activities and with at least 3 years of work experience. The interview process generated narrative data describing how employees performed tasks, made decisions, and responded to situational challenges. Table 3 presents examples of raw tacit knowledge narratives extracted from interview sessions across various divisions and activities.

Table 2
Sample of Elicited Tacit Knowledge Narratives

Division	Activity	Tacit Knowledge Narrative
Sales & Marketing	Client Engagement	Sales personnel explained that securing client commitment depends on their accumulated experience in interpreting client reactions during interactions, flexibly adjusting communication approaches, and leveraging trust developed through long-term professional relationships.
Project Delivery	Project Planning	Project managers indicated that project estimates are often adjusted based on personal experience with similar projects, particularly when formal planning data does not fully reflect actual project conditions.
Product Development	System Design	Software developers reported that technical decisions are frequently informed by prior hands-on experience with system failures and debugging, leading them to rely more on practical learning than on written technical guidelines alone.

Source: Processed Tacit Knowledge, 2025

The results of this stage indicated that most of the important knowledge at PT XYZ was tacit and embedded within individuals. This finding confirmed that interviews served as an initial mechanism for transforming implicit knowledge into manageable information sources. The tacit narratives generated at this stage served as crucial raw materials for the next process: structuring and organizing knowledge so it could be stored, reused, and preserved as organizational memory.

In the third stage, the raw narrative statements from the interviews were systematically organized into standardized knowledge categories. This process was crucial because tacit knowledge, while valuable, could not serve as an organizational information asset unless it was structured, labeled, and linked to the business context. This process was accomplished through thematic coding. Similar statements were grouped, normalized, and assigned knowledge codes to ensure consistency. Each piece of knowledge was then linked to its associated business activity and organizational division.

Table 3
Structured Organizational Knowledge

Code	Summary of Tacit Knowledge from Interviews	Knowledge Category	Related Activity	Related Division	Knowledge Type	Preservation Strategy
K01	Practical understanding of system component interdependencies is used to explain product functionality to clients and internal teams.	Product Workflow	Sales & Marketing, Project Delivery	SA, Developer	Hybrid	SOP + process documentation validated by senior staff
K02	Ability to interpret client needs and translate them into feasible technical and business solutions based on prior project experience.	Business Analysis	Sales & Marketing, Project Delivery	PM, Manager	Hybrid	Case-based documentation + mentoring
K03	Experiential knowledge of required documentation types and formats to support audits, project handover, and compliance.	Documentation	Product Development, Project Delivery	SA, Admin	Explicit	Standard document templates & repository
K04	Knowledge of coordinating schedules, resources, and responsibilities to ensure project completion under dynamic conditions.	Project Management	Project Delivery	PM	Hybrid	Project playbook + post-project review
K05	Experience-based capability in managing team dynamics, motivation, and conflict during high-pressure project situations.	Team Management	Project Delivery	PM	Tacit	Mentoring & leadership coaching

K06	Contextual communication skills for aligning understanding among diverse stakeholders with different expectations and roles.	Communication Management	Sales & Marketing, Project Delivery	PM, Sales	Tacit	Shadowing & reflective practice notes
K07	Situational judgment in identifying potential project risks and determining appropriate mitigation or escalation strategies.	Risk Analysis	Project Delivery	PM	Tacit	Scenario-based lessons learned repository
K08	Experience-driven ability to secure stakeholder agreement and commitment, particularly during changing project requirements.	Gaining Commitment	Sales & Marketing, Service & Support	PM, Sales	Tacit	Best practice narratives + mentoring
K09	Relational knowledge for building and maintaining long-term trust-based relationships with clients.	Building Positive Working Relationships	Sales & Marketing, Project Delivery	Sales	Tacit	Community of practice & experiential sharing
K10	Estimation skills developed through accumulated project experience to predict cost, effort, and duration accurately.	Estimation Analysis	Project Delivery	PM	Hybrid	Historical project estimation database
K11	Practical know-how in selecting and using project management tools to support coordination and monitoring.	Project Tool Utilization	Project Delivery	PM	Explicit	Tool manuals & internal training materials
K12	Analytical understanding of emerging technologies and their applicability to organizational products and services.	R&D Technology Analysis	Product Development	Developer	Tacit	Technical knowledge sharing sessions + R&D log
K13	Experience-based assessment of financial trade-offs between project costs and expected business benefits.	Cost-Benefit Analysis	Sales & Marketing, Project Delivery	PM, Finance	Hybrid	Analytical templates + reviewed case examples
K14	Strategic insight for determining appropriate project approaches based on client context, constraints, and objectives.	Project Strategy	Project Delivery	PM	Tacit	Strategic decision rationale documentation
K15	Tacit programming expertise enabling efficient, maintainable, and adaptive	Programming	Product Development, Project Delivery	Developer	Hybrid	Code repository + peer review records

	code development under time constraints.					
K16	Experiential knowledge in selecting development tools that align with project scope, team capability, and constraints.	Development Tools Utilization	Product Development, Project Delivery	Developer	Explicit	Technical guidelines & how-to documentation
K17	Persuasive capability developed through repeated client interactions to influence purchasing and decision-making.	Customer Persuasive	Sales & Marketing	Sales	Tacit	Sales playbook enriched with experience notes
K18	Ability to recognize potential business opportunities from informal signals, discussions, and market interactions.	Read Opportunities	Sales & Marketing	Sales	Tacit	Opportunity assessment cases & mentoring
K19	Strategic marketing insight for designing approaches tailored to specific client segments and market conditions.	Marketing Strategy	Sales & Marketing	Sales	Tacit	Strategy review documents & management briefing archive
K20	Quality assurance knowledge based on experience in evaluating outputs against agreed technical and functional standards.	Quality Control	Product Development, Project Delivery	SA	Hybrid	Quality checklist + defect case repository
K21	Knowledge of allocating and managing human resources to support operational and project needs effectively.	Human Resource Management	Support Activity	HR	Explicit	HR policies & procedural manuals
K22	Experience-based understanding of developing employee competencies aligned with future organizational needs.	Human Resource Development	Support Activity	HR	Tacit	Training design documentation + mentoring
K23	Analytical insight into organizational positioning, competition, and strategic direction within the market.	Business Strategy	Sales & Marketing, Project Delivery	Manager, CEO	Tacit	Strategy formulation records & executive review notes
K24	Decision-making knowledge developed through executive experience in selecting strategic options under uncertainty.	Decision Business Strategy	Sales & Marketing, Project Delivery	CEO	Tacit	Decision log with contextual annotations

Source: Processed knowledge structure by Author, 2025

Table 3 demonstrates how tacit knowledge embedded in individual experience can be systematically transformed into explicit organizational knowledge. It shows that 24 pieces of knowledge are required to implement a company's business strategy. These results also reveal that most structured knowledge units are concentrated in core business activities, particularly sales and marketing, project delivery, and product development.

In the fourth stage, critical knowledge was obtained through the knowledge analysis in Table 3 and justified back to top management. After interviews with top management to validate the identification results, it was inferred that not all knowledge aligned with the company's business strategy needs could be categorized as critical knowledge. Each critical knowledge would be generated with a CK codification format and name, followed by a knowledge number to facilitate naming the item. The CK and codification are shown in Table 4.

Table 4
Critical Knowledge

Code	CK Code	Knowledge	Rarity	Utility	Difficulty	CKF Score
K01	CK9	Product Workflow	3	3	4	10
K02	CK14	Business Analysis	4	5	4	13
K03		Documentation	1	1	2	4
K04	CK10	Project Management	4	4	4	12
K05	CK11	Team Management	3	4	3	10
K06	CK12	Communication Management	4	4	3	11
K07	CK13	Risk Analysis	3	3	4	10
K08	CK15	Gaining Commitment	5	5	5	15
K09	CK2	Building Positive Working Relationships	3	4	3	10
K10	CK16	Estimation Analysis	4	4	4	12
K11	CK20	Project Tool Utilization	4	3	3	10
K12	CK7	R&D Technology Analysis	3	4	3	10
K13	CK3	Cost-Benefit Analysis	4	4	3	11
K14	CK17	Project Strategy	4	4	3	11
K15	CK8	Programming	3	4	3	10
K16		Development Tools Utilization	1	1	1	3
K17	CK1	Customer Persuasive	4	2	4	10
K18	CK4	Read Opportunities	5	5	4	14
K19	CK5	Marketing Strategy	5	5	4	14
K20	CK6	Quality Control	3	4	3	10
K21		Human Resource Management	1	1	1	3
K22		Human Resource Development	1	1	1	3
K23	CK18	Business Strategy	4	4	3	11
K24	CK19	Decision Business Strategy	5	4	3	12

Source: Result Critical knowledge PT XYZ, 2025

Based on the CKF assessment, only 20 of the 24 identified knowledge areas were classified as critical knowledge, while *Documentation, Development Tool Utilization, Human Resource Management,* and *Human Resource Development* were

excluded because their aggregate CKF scores were below the organizational average of 9.96. After validation, management confirmed that employee turnover in these knowledge areas could be effectively managed through existing procedures, training, and documentation, despite their criticality to day-to-day operations.

Although documentation knowledge was not classified as critical by the CKF assessment, this exclusion should not be interpreted as an indication of low organizational importance. From an information and archival governance perspective, documentation functions as an enabling infrastructure that stabilizes access, accountability, and the long-term preservation of other critical knowledge assets (Smallwood, 2021). Therefore, documentation knowledge plays an indirect yet foundational role in sustaining organizational memory, even when it is not prioritized as a vulnerable knowledge domain.

To obtain the critical knowledge ranking, a list of critical knowledge was compiled using weighted pairwise comparisons with the AHP method. The criterion being compared in this case was critical knowledge. Researchers used an Excel formula to implement the AHP and Zoom for collaborative discussions on how to complete it. The results of the critical knowledge ranking are shown in Table 5.

Table 5
Critical Knowledge Ranking

Code	Code CK	Critical knowledge	Score
K08	CK7	Gaining Commitment	0.14121
K18	CK16	Read Opportunities	0.12564
K19	CK17	Marketing strategy	0.11330
K02	CK2	Business Analysis	0.07712
K10	CK9	Estimation Analysis	0.07589
K04	CK3	Project Management	0.06979
K24	CK20	Decision Business Strategy	0.06138
K23	CK19	Business Strategy	0.05526
K14	CK13	Project Strategy	0.04820
K06	CK5	Communication Management	0.03261
K13	CK12	Cost-benefit analysis	0.03182
K20	CK18	Quality Control	0.02565
K15	CK14	Programming	0.02451
K05	CK4	Team Management	0.02232
K09	CK8	Building Positive Working Relationships	0.02232
K01	CK1	Product Workflow	0.01642
K07	CK6	Risk Analysis	0.01621
K12	CK11	R&D Technology Analysis	0.01602
K11	CK10	Project Tool Utilization	0.01303
K17	CK15	Customer Persuasive	0.01132

Source: Result Scoring Critical Knowledge, 2025

Based on Table 5, the score column represents the normalized priority weights obtained from pairwise comparisons among the 20 identified critical knowledge items. The AHP analysis produced a consistency ratio (CR) of 0.087, which falls within the acceptable threshold (CR ≤ 0.10), indicating that the decision makers's judgements are logically consistent and reliable. The results show that the three highest-priority critical knowledge areas are *Gaining Commitment, Read Opportunities,* and *Marketing Strategy*. This suggests that critical knowledge in IT consulting should be understood not only in terms of technical expertise, but also as market-oriented and relational capabilities that are highly tacit and difficult to substitute. These knowledge areas are primarily associated with sales and marketing activities, indicating that these business functions contain knowledge assets of relatively high strategic importance and vulnerability if not managed properly. These findings suggest that while technical knowledge remains important for service delivery, relational, strategic, and opportunity-recognition knowledge play a more decisive role in securing projects and maintaining organizational performance (Edwards, 2022). These results supported the view that competitive advantage in consulting firms was increasingly shaped by cross-border, market-oriented knowledge, rather than solely technical capabilities. This knowledge fell within the rarity dimension of the Critical Knowledge Factor, as it relied heavily on leadership capability, experiential judgment, and interpersonal influence that were difficult to codify and could not be easily substituted by other organizational members. This corroborates previous knowledge management research suggesting that the most strategically valuable knowledge in consulting firms is often the least codified and most dependent on experiential judgment and social interactions. Consequently, the loss of this knowledge poses significant risks to organizational sustainability and performance. From an analytical perspective, these results demonstrate that critical knowledge in IT consulting firms is not evenly distributed across activities but is concentrated in functions that directly influence client acquisition, strategic decision-making, and organizational continuity.

Therefore, knowledge management cannot stop at the identification and ranking stages, but must continue to the documentation, storage, preservation, and reuse stages through a structured knowledge repository. In this study, the repository is not positioned solely as a technological system but also as an information management mechanism designed to sustain organizational memory. Before knowledge is stored in a repository, it must be documented in a structured and consistent format. The documentation structure follows the results of the knowledge structuring and CKF assessment stages. Each knowledge item is associated with a related activity, division, and criticality level. This structure allows organizations to clearly see which knowledge supports which business processes and why that knowledge is considered important.

Table 6
Design structured critical knowledge documentation

Column	Column Description
CK Code	Unique identifier from CKF and AHP
Knowledge Title	Name of critical knowledge
Knowledge Description	Summary of tacit knowledge from interviews
Knowledge Source	Role of knowledge holders
Related Activity	Value chain activity
Criticality Level	Result of CKF assessment
Priority Rank	Result of AHP
Risk of Loss	Impact if the knowledge holder leaves
Documentation Form	How knowledge is captured

Source: Processed from research results, 2025

Once documented in this format, knowledge is no longer dependent on a single individual. Other employees can understand the context, importance, and application of the knowledge. This structured documentation serves as the foundation for building sustainable organizational memory.

Rather than organizing knowledge solely by department, the repository in this study was structured around core business activities. This approach made it easier for users to locate knowledge that supported their daily tasks. Table 7 illustrates how critical knowledge is practically organized within the repository.

Table 7
Design Knowledge Repository Structure

Repository Layer	Description
Activity Folder	Main classification
CK Subfolder	Critical knowledge item
Main Document	Knowledge content
Metadata Record	Descriptive information
Version History	Record of updates
Access Log	Usage record

Source: Conceptualized from study results, 2025

This repository of recommendations allowed employees to access relevant knowledge without extensive searching and served as a shared learning space rather than a static archive.

Not all critical knowledge should be accessible to everyone. Some knowledge contained strategic insights or sensitive experiences that must be protected. We used Role-Based Access Control (RBAC) to ensure knowledge was accessed, modified, and validated only by the appropriate roles. Table 8 presents real-world examples of access control based on organizational roles identified in the study.

Table 8
Example of RBAC matrix structure for critical knowledge

Role	Real Access Example	Permission
Sales Staff	Reading CK15 case study	View
Project Manager	Adding new experience notes	Edit
Manager	Approving the final version	Validate
Top Management	Accessing all critical knowledge	Full
Knowledge Administrator	Managing repository structure	Full

Source: Derived from organizational roles, 2025

RBAC helps maintain the quality and reliability of stored knowledge while still encouraging controlled sharing across the organization. Preserved knowledge only creates value when it is reused. Reuse occurs when stored knowledge supports real organizational activities such as learning, decision-making, and risk mitigation.

Table 9 presents practical reuse scenarios derived from PT XYZ's organizational context.

Table 9
Example of Knowledge Reuse Scenarios

Reuse Scenario	Real Organizational Use
Onboarding	New sales staff study CK15 negotiation cases
Decision Support	Managers review past strategies before negotiations
Training	Simulation exercises based on real project cases
Risk Mitigation	Knowledge backup during employee turnover

Source: Developed from organizational context, 2025

Through these reuse scenarios, knowledge repositories serve as practical tools for organizational learning and sustainability. Knowledge preservation is therefore not merely an archiving activity, but also a strategic mechanism to support long-term organizational performance.

In this study, the authors recommended and positioned managerial roles as policymakers and knowledge validators to ensure accuracy and strategic relevance. Meanwhile, knowledge administrators were responsible for metadata management, version control, and access monitoring. These governance mechanisms ensured that preserved knowledge remained reliable, up to date, and aligned with organizational strategy. By embedding information governance principles into repository design, critical knowledge can be preserved, creating a sustainable organizational memory system. The findings indicated that critical knowledge in IT consulting firms was not only a managerial issue but also an organizational and information-control issue. The dominance of tacit and relational knowledge underscored the limitations of informal knowledge-sharing practices when organizational sustainability depended on individual experience. By structuring, prioritizing, and organizing knowledge through lifecycle-based documentation and repository mechanisms, organizations can transform fragile experiential knowledge into durable organizational information. This reinforces the role of information systems,

documentation standards, and governance policies as foundational elements in sustaining organizational memory beyond an individual's tenure. This study provided practical guidance for managers in IT consulting firms by offering a structured method for identifying, prioritizing, and preserving critical tacit knowledge. Managers could use the proposed CKF–AHP framework to reduce dependency on key individuals, design targeted knowledge preservation strategies, and strengthen organizational memory. The repository model further supports controlled access, knowledge reuse, and informed decision-making, contributing to long-term organizational sustainability.

CONCLUSION

This study demonstrates that critical knowledge in IT consulting firms is predominantly tacit, experiential, and closely tied to strategic business activities. Through a structured six-stage approach, this study identifies 20 critical knowledge areas at PT XYZ that significantly impact organizational performance. The prioritization results indicate that Gaining Commitment, Identifying Opportunities, and Marketing Strategy are the most critical knowledge assets, all embedded in sales and marketing activities. These findings highlight that competitive advantage in IT consulting is not solely driven by technical expertise, but also by strategic and relational knowledge that is difficult to replace. The study's main contribution lies in integrating strategic analysis frameworks with information management principles, enabling the capture, structuring, prioritization, and preservation of tacit knowledge as organizational information assets. Thus, this research contributes to the field of information science by demonstrating how organizational knowledge can be governed through documentation systems, information repositories, and lifecycle-based preservation rather than being treated solely as individual expertise. Unlike previous studies that focus mainly on knowledge sharing, this study extends KM practices to design knowledge repositories that support documentation, controlled access, preservation, and reuse. By treating critical knowledge as part of the information lifecycle, organizations can reduce their dependence on individuals and strengthen organiaztional memory. Although this study is limited to a single organization, the proposed approach offers a transferable framework for other IT consulting firms facing similar challenges. Future research may apply this model across multiple organizations or examine the long-term impact of knowledge reuse on organizational learning and performance.

REFERENCES

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly: Management Information Systems*, *25*(1), 107–136. https://doi.org/10.2307/3250961

Bloem, V., & Salimi, N. (2023). Role of knowledge management processes within different stages of technological innovation: evidence from biotechnology SMEs. *Knowledge Management Research and Practice*, *21*(4), 822–836. https://doi.org/10.1080/14778238.2022.2064352

Bode, M., Daneva, M., & van Sinderen, M. J. (2022). Characterizing the digital transformation of IT consulting services–Results from a systematic mapping study. *IET Software*, *16*(5), 455–477. https://doi.org/10.1049/sfw2.12068

Chen, Y., Li, H., & Zhou, W. (2022). The role of critical knowledge management in IT consulting firms' innovation performance. *Information & Management*, *59*(1), 103456. https://doi.org/10.1016/j.im.2021.103456

Davenport, T., & Prusak, L. (1998). Working knowledge: how organizations manage what they know. *Choice Reviews Online*, *35*(09), 35-5167-35–5167. https://doi.org/10.5860/choice.35-5167

Edwards, J. S. (2022). Where knowledge management and information management meet: Research directions. *International Journal of Information Management*, *63*, 102458. https://doi.org/10.1016/j.ijinfomgt.2021.102458

Elia, G., Solazzo, G., Lerro, A., Pigni, F., & Tucci, C. L. (2024). The digital transformation canvas: A conceptual framework for leading the digital transformation process. *Business Horizons*, *67*(4), 381–398. https://doi.org/10.1016/j.bushor.2024.03.007

Ermine, J.-L., Boughzala, I., & Tounkara, T. (2006). Critical knowledge map as a decision tool for knowledge transfer actions. *Electronic Journal of Knowledge Management*, *4*(2), 129–140. https://academic-publishing.org/index.php/ejkm/article/view/744

Gaimon, C., & Ramachandran, K. (2021). The knowledge value chain: An operational perspective. *Production and Operations Management*, *30*(3), 715–724. https://doi.org/10.1111/poms.13312

Katuu, S. (2020). Managing digital records in enterprise content management systems. *Records Management Journal*, *30*(2), 151–167. https://doi.org/10.1108/RMJ-08-2019-0046

Mendes, E., Wohlin, C., Felizardo, K., & Kalinowski, M. (2020). When to update systematic literature reviews in software engineering. *Journal of Systems and Software*, *167*, 110607. https://doi.org/10.1016/j.jss.2020.110607

Mirafzal, M. R., Wadhera, P., & Stal-Le Cardinal, J. (2023). an Exploration of knowledge management activities in multidisciplinary service design organizations. *Proceedings of the Design Society*, *3*, 525–534. https://doi.org/10.1017/pds.2023.53

Onofre, I., & Teixeira, L. (2022). Critical factors for a successful knowledge management implementation: A systematic literature review. *Electronic Journal of Knowledge Management*, *20*(2), 93–109. https://doi.org/10.34190/ejkm.20.2.2357

Orero-Blat, M., Palacios-Marqués, D., & Garzón, D. (2021). Knowledge assets for internationalization strategy proposal. *Journal of Innovation and Knowledge*, *6*(4), 214–221. https://doi.org/10.1016/j.jik.2020.08.002

Patel, R., Singh, A., & Desai, P. (2023). Adapting knowledge models in

dynamic IT consulting environments. *Information Systems Frontiers*, *25*(2), 301–315. https://doi.org/10.1007/s10796-022-10353-x

Peppard, J., & Ward, J. (2004). Beyond strategic information systems: Towards an IS capability. *Journal of Strategic Information Systems*, *13*(2), 167–194. https://doi.org/10.1016/j.jsis.2004.02.002

Rahman, F., Ahmad, S., & Khan, M. (2021). Critical knowledge identification in IT consulting firms: A systemic approach. *Information & Management*, *58*(4), 103429. https://doi.org/10.1016/j.im.2020.103429

Rosário, A. T., & Raimundo, R. (2024). Importance of competitive dynamics of strategic groups: opportunities and challenges. *Administrative Sciences*, *14*(7), 147. https://doi.org/10.3390/admsci14070147

Saaty, T. L. (2002). Decision making with the Analytic Hierarchy Process. *Scientia Iranica*, *9*(3), 215–229. https://doi.org/10.1504/ijssci.2008.017590

Saaty, T. L. (2012). Decision making for leaders. In *IEEE Transactions on Systems, Man, and Cybernetics: Vol. SMC-15* (Issue 3). RWS Publications. https://doi.org/10.1109/tsmc.1985.6313384

Sahibzada, U. F., & Mumtaz, A. (2023). Knowledge management processes toward organizational performance – a knowledge-based view perspective: an analogy of emerging and developing economies. *Business Process Management Journal*, *29*(4), 1057–1091. https://doi.org/10.1108/BPMJ-09-2022-0457

Singh, N., & Pradhan, S. (2024). Evaluating the success factors for knowledge management in the financial dector: an Ahp-Dematel approach. *International Journal of the Analytic Hierarchy Process*, *16*(1). https://doi.org/10.13033/ijahp.v16i1.1175

Smallwood, R. F. (2021). Information governance and information lifecycle management. *Journal of Information Science*, *47*(2), 235–248. https://doi.org/10.1177/0165551520958606

Smiraglia, R. P. (2021). Knowledge organization systems and the organization of knowledge. *Knowledge Organization*, *48*(3), 175–189. https://doi.org/10.5771/0943-7444-2021-3-175

Smith, J., & Johnson, R. (2021). Value chain analysis and knowledge management in IT consulting firms. *Journal of Knowledge Management*, *25*(3), 456–473. https://doi.org/10.1108/JKM-04-2021-0267

Tanjung, A. M., & Sensuse, D. I. (2024). Analysis of critical success factors for KM foundation in a consulting company. *International Journal of Artificial Intelligence Research*, *8*(1), 99. https://doi.org/10.29099/ijair.v8i1.1182

Tavana, M., Soltanifar, M., & Santos-Arteaga, F. J. (2023). Analytical hierarchy process: revolution and evolution. *Annals of Operations Research*, *326*(2), 879–907. https://doi.org/10.1007/s10479-021-04432-2

Wilms, K. L., Stieglitz, S., Ross, B., & Meske, C. (2020). A value-based perspective on supporting and hindering factors for research data management. *International Journal of Information Management*, *54*, 102174. https://doi.org/10.1016/j.ijinfomgt.2020.102174

Yates, J., & Paquette, S. (2020). Structuring digital information for knowledge reuse: Archival and organizational perspectives. *Journal of Documentation*, *76*(3), 677–695. https://doi.org/10.1108/JD-09-2019-0181

Yazdani, S., Bayazidi, S., & Mafi, A. A. (2020). The current understanding of knowledge management concepts: A critical review. *Medical Journal of the Islamic Republic of Iran*, *34*(1), 1–10. https://doi.org/10.34171/mjiri.34.127