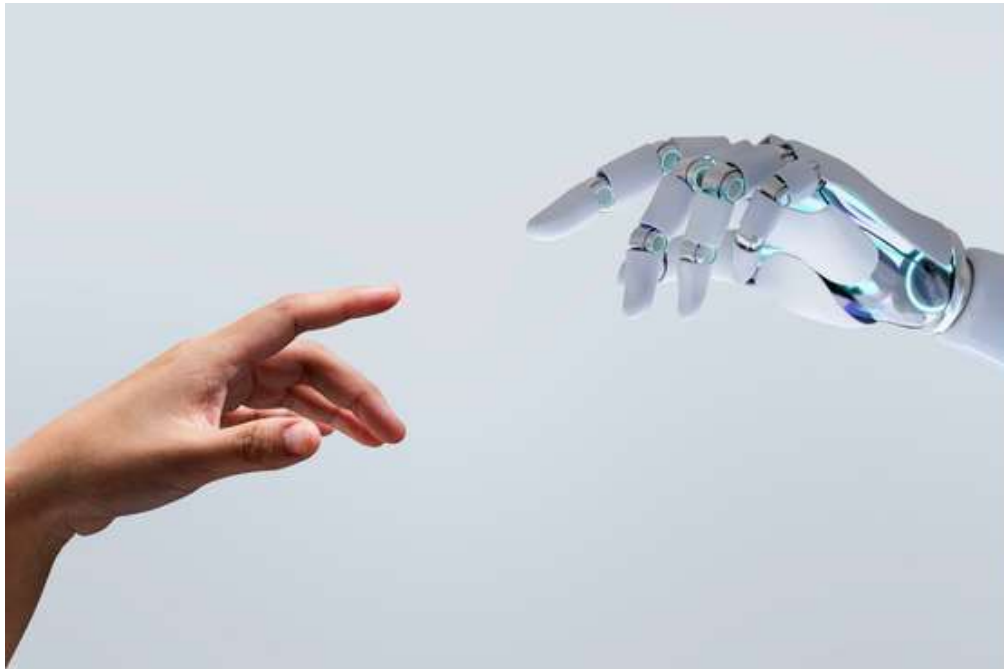


Using AI-Powered Chatbots to Capture and Share Tacit Knowledge in Organizations



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Abstract

Tacit knowledge, rooted in human experience and action, is one of the most valuable yet difficult assets for organizations to capture and share. With the growing adoption of artificial intelligence, chatbots are emerging as powerful tools for transforming this hidden knowledge into accessible insights. This paper examines how AI-powered chatbots can support the capture, transfer, and management of tacit knowledge across organizational settings.

The study synthesizes findings from peer-reviewed articles to explore both opportunities and challenges. Key themes include chatbot design, natural language processing, and integration with enterprise systems, as well as barriers such as motivation, digital literacy, and trust. The analysis shows that chatbots are most effective when combined with human-centered practices such as mentoring and community exchange. By embedding conversational capture into daily workflows, organizations can create living knowledge systems that make tacit expertise more visible, shareable, and reusable.

1. Introduction

Knowledge is one of the most essential resources for sustaining innovation, competitiveness, and growth in organizations. Tacit knowledge is rooted in the minds of employees, expressed through actions and insights that are not easily captured. When employees retire, change jobs, or fail to communicate their insights, this knowledge is at risk of being lost, and the consequences are significant.

The significance of addressing this challenge is outlined by global trends, as Malekolkalami and Nazeri (2021) emphasize, nearly 40 percent of the global economy is project-based, meaning that organizations must constantly transfer knowledge between temporary teams and across project boundaries. In an increasingly digital and distributed environment, traditional methods are insufficient on their own to preserve and circulate tacit knowledge.

Artificial Intelligence (AI), especially chatbots, is becoming a practical tool for knowledge management. Chatbots can draw out employee experiences, turn unstructured input into usable insights, and help organizations capture knowledge that might otherwise remain hidden (Capelli & Fusco, 2024; Zaoui et al., 2025). For example, systems like WeKnow (Li & Feng, 2024) show how pairing chatbots with mentorship and gamification can make this process more effective.

This paper explores how AI-powered chatbots can be designed and integrated into knowledge systems to capture and share tacit knowledge. While chatbots cannot replace human interaction, studies suggest that they are becoming a critical tool for preserving expertise, fostering collaboration, and sustaining information.

2. Literature Review

2.1 Knowledge Types and Theories

Organizational knowledge is often categorized as explicit, implicit, and tacit. Explicit knowledge is codified and easily shared through manuals or databases, implicit knowledge is less formal but can be articulated when needed, and tacit knowledge is rooted in personal experience and intuition, difficult to express but essential for innovation and adaptability. (Li & Feng, 2024).

Tacit knowledge, as Dalkir (2017) explains, is experiential and context-specific, making it difficult to articulate, while explicit knowledge is codified and transferable. This distinction underpins why chatbots are being explored to surface otherwise inaccessible insights.

Tacit knowledge is both critical and fragile, as it fuels problem-solving and creativity but is easily lost when employees retire or leave (Falckenthal et al., 2025). To explain how such knowledge is shared, Nonaka's SECI model (Socialization, Externalization, Combination, Internalization) describes a cycle where tacit knowledge is shared, codified, combined, and reabsorbed into practice (Schultze & Leidner, 2002). This framework shows how AI-powered chatbots can help externalize tacit insights that might remain hidden.

2.2 Traditional Tacit Knowledge Sharing

Before digital systems, organizations relied on human-centered methods to share tacit knowledge, such as mentorship, apprenticeships, storytelling, job shadowing, and Communities of Practice (CoPs). These relational approaches depend on trust, observation, and interaction to transmit technical expertise along with judgment and intuition (Falckenthal et al., 2025; Wenger, 2011).

While these traditional methods are effective, they set limits in today's world. Remote and hybrid work reduces information interactions, geographic dispersion hinders collaboration,

and time pressures leave little room for reflection. Knowledge transfer also becomes fragile when experienced employees retire or leave. Because of this, traditional approaches are insufficient on their own to preserve and scale tacit knowledge in modern organizations (Schultze & Leidner, 2002).

Sharda et al. (2019) emphasize that business intelligence and analytics tools extend the capacity of organizations to transform raw data into actionable insights. Integrating chatbots into these systems represents a natural progression, as conversational agents act as front-end interfaces that capture tacit reflections and link them to BI dashboards and repositories.

2.3 ICT, Digitization, and Digitalization in Knowledge Management

The evolution of information and communication technologies (ICT) has transformed how organizations manage knowledge, enabling storage, retrieval, and access across distributed teams (Schultze & Leidner, 2002). However, effectiveness depends not just on storing information but on how it is structured, accessed, and applied.

A key distinction is between digitization, converting analog resources into digital formats, and digitalization, which embeds digital tools into workflows to support learning and decision-making (Malekolkalami & Nazeri, 2021). While digitization makes resources accessible, digitalization actively transforms practices and processes.

For tacit knowledge, digitalization is especially important because storing documents or videos rarely ensures transfer, whereas interactive tools like chatbots can prompt reflection, structure employee input with NLP, and share insights across teams. This highlights why digitalization, more than digitization, is central to embedding tacit knowledge in modern knowledge systems (Zaoui et al., 2025).

2.4 AI and Chatbots in Knowledge Management

Artificial intelligence has become a transformative force in knowledge management, with chatbots emerging as one of the most impactful applications. A chatbot is a conversational system that simulates human dialogue through text, voice, or multimodal interaction. When integrated into KM systems, chatbots make conversations searchable, structured, and reusable, enabling organizations to capture and transfer tacit knowledge (Capelli & Fusco, 2024).

The evolution of chatbots reflects advances in computing and AI. Early systems such as ELIZA (1966) relied on simple pattern matching, while later developments introduced machine learning, natural language processing (NLP), and big data analytics, which made responses more adaptive (Malekolkalami & Nazeri, 2021). Today, generative AI powered by large language models (LLMs) can summarize documents, recommend resources, and engage in dialogue that approximates human reasoning (Feng, 2024).

Modern chatbots draw on technical foundations such as NLP pipelines, sentiment and semantic analysis, and cloud computing to scale enterprise use (Zaoui et al., 2025; Kaur et al., 2022). These systems do more than answer questions: they capture reflections, tacit experiences, and unstructured narratives, converting them into structured knowledge assets.

Applications illustrate this potential across industries. The WeKnow system uses reflections and gamification to build searchable knowledge banks (Li & Feng, 2024). In project-based organizations, chatbots help transfer lessons across teams (Malekolkalami & Nazeri, 2021). NLP pipelines convert unstructured chats into organizational memory (Zaoui et al., 2025), while generative assistants summarize resources and contextualize insights (Capelli & Fusco, 2024). In industrial settings, they capture operator know-how and workarounds to preserve

experiential knowledge (Freire et al., 2023; Ren et al., 2023). Together, these examples show how chatbots extend KM beyond static repositories, making tacit knowledge more visible and transferable across contexts.

2.5 Opportunities and Gaps

The literature highlights both opportunities and gaps in using AI-powered chatbots for tacit knowledge management. Chatbots extend KM further than static databases by prompting employees to articulate unspoken reflections, facilitating dialogue across generations, and scaling input capture across different teams. With NLP and machine learning, they adapt responses to user context, while gamification and recognition features encourage participation. Embedding chatbots into enterprise platforms and cloud infrastructures further integrates tacit knowledge into organizational systems (Li & Feng, 2024; Malekolkalami & Nazeri, 2021; Zaoui et al., 2025; Falckenthal et al., 2025; Kaur et al., 2022).

At the same time, adoption faces several obstacles. Digital literacy gaps and motivational barriers limit participation, especially among employees who view chatbots as extra work (Freire et al., 2023). Trust remains an issue, with doubts about whether chatbots can capture nuanced expertise and concerns over surveillance (Quinn & Gutt, 2025). Risks also include incomplete or biased inputs codified into organizational memory, and NLP's ongoing limitations in handling ambiguity or context (Schultze & Leidner, 2002; Zaoui et al., 2025). Importantly, research stresses that chatbots work best when paired with human-centered practices like mentorship and informal knowledge-sharing, rather than as stand-alone solutions (Li & Feng, 2024).

These insights suggest that chatbots are powerful enablers but succeed only with careful design, cultural alignment, and integration into broader organizational practices. When viewed as

complements to human expertise, they are more likely to capture and sustain tacit knowledge effectively.

3. Chatbots in Knowledge Management

3.1 What is a Chatbot? Evolution Over Time

A chatbot is an AI-driven conversational system that simulates dialogue through text, voice, or multimodal interfaces. Its core function is to process input, recognize intent, and generate responses. While widely used in customer service, healthcare, and education, their role in knowledge management is more recent, focusing on externalizing and sharing tacit knowledge (Capelli & Fusco, 2024).

The earliest systems, such as ELIZA (1966) and ALICE in the 1990s, relied on scripted rules and pattern matching with little real understanding. By the 2000s, intent-based models and simple machine learning improved flexibility but still struggled with ambiguity. Advances in big data, cloud computing, and natural language processing later produced intelligent agents capable of parsing language, detecting sentiment, and offering adaptive responses (Kaur et al., 2022).

The most recent stage involves generative AI powered by large language models, which can summarize documents, synthesize insights, and transform employee reflections into structured knowledge assets. Systems such as WeKnow (Li & Feng, 2024) highlight this shift from chatbots as passive responders to active collaborators in knowledge creation. This evolution explains why chatbots are becoming vital for tacit knowledge management, offering the ability to capture nuance and context once locked in personal experience.

3.2 Types of Chatbots

Chatbots can be categorized into different types based on their design, goal, and functionality. Each type provides distinct capabilities for knowledge management (KM), especially in the context of capturing and sharing tacit knowledge.

Rule-based chatbots are the simplest systems, relying on predefined scripts and pattern-matching rules. They are effective for routine queries but limited in flexibility. In KM, rule-based bots may assist with FAQs or document retrieval but are incapable of externalizing tacit knowledge since they cannot process nuance or context (Malekolkalami & Nazeri, 2021).

Keyword- or intent-based chatbots use basic natural language processing (NLP) and machine learning to detect user intent and retrieve relevant information. They are more adaptive than rule-based bots and can handle unstructured queries, making them suitable for capturing some implicit knowledge. However, their ability to manage tacit insights is still limited by their reliance on predefined intents.

AI-powered conversational agents incorporate machine learning, big data, and advanced NLP to deliver context-aware interactions. They are capable of guiding employees through structured reflections, classifying tacit knowledge inputs, and integrating insights into KM systems (Zaoui et al., 2025).

Generative AI Chatbots are the most advanced, powered by large language models (LLMs) to enable more than retrieval to synthesis. They can summarize complex inputs, detect sentiment, and recommend connections across disparate knowledge sources. In KM, generative AI chatbots hold the strongest potential for tacit knowledge capture, as they are able to transform unstructured employee narratives into actionable organizational memory (Capelli & Fusco, 2024).

These types illustrate the evolutionary path from simple automation to intelligent knowledge collaborators. The closer a chatbot comes to generative, context-aware interaction, the greater its utility for capturing tacit knowledge.

4.0 Case Studies and Applications

4.1 The WeKnow Hybrid Chatbot System

One detailed case study of chatbot use for tacit knowledge management is the WeKnow system developed by Li and Feng (2024). Created for a design competition on preventing tacit knowledge loss, WeKnow represents a hybrid program that combines an AI-powered chatbot with offline motivational strategies.

The chatbot prompts employees with daily reflection questions, allowing responses through text, voice, or images. These reflections are tagged and stored in a knowledge bank, making insights searchable across the organization. In this way, WeKnow supports the externalization stage of Nonaka's SECI model by turning tacit experiences into explicit

knowledge assets.

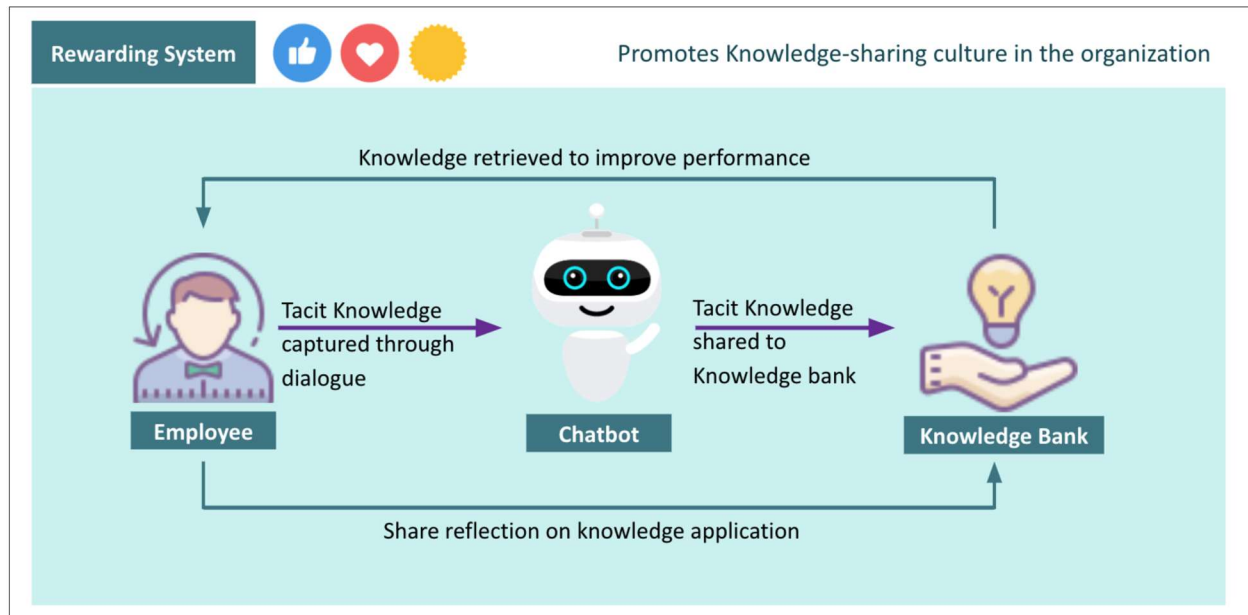


Figure 1. *An Integrated System to Capture and Utilize Tacit Knowledge.*

Note. Reprinted from “Designing a Hybrid Program to Utilize Tacit Knowledge,” by X. Li & Y. Feng, 2024, *Journal of Knowledge Management*, 28(2).

A key feature of the system is gamification, which uses tagging, leaderboards, and recognition rewards to encourage participation and sustain engagement. WeKnow also integrates offline interventions such as poster campaigns, mentorship programs, and informal brown-bag sessions, embedding tacit knowledge sharing into organizational culture.

The project revealed challenges as well. Some employees viewed daily reflections as burdensome, while others struggled with access to digital tools. Cultural differences also shaped attitudes toward knowledge sharing. Li and Feng (2024) conclude that systems like WeKnow succeed when designed with inclusivity, motivation, and cultural adaptation in mind.

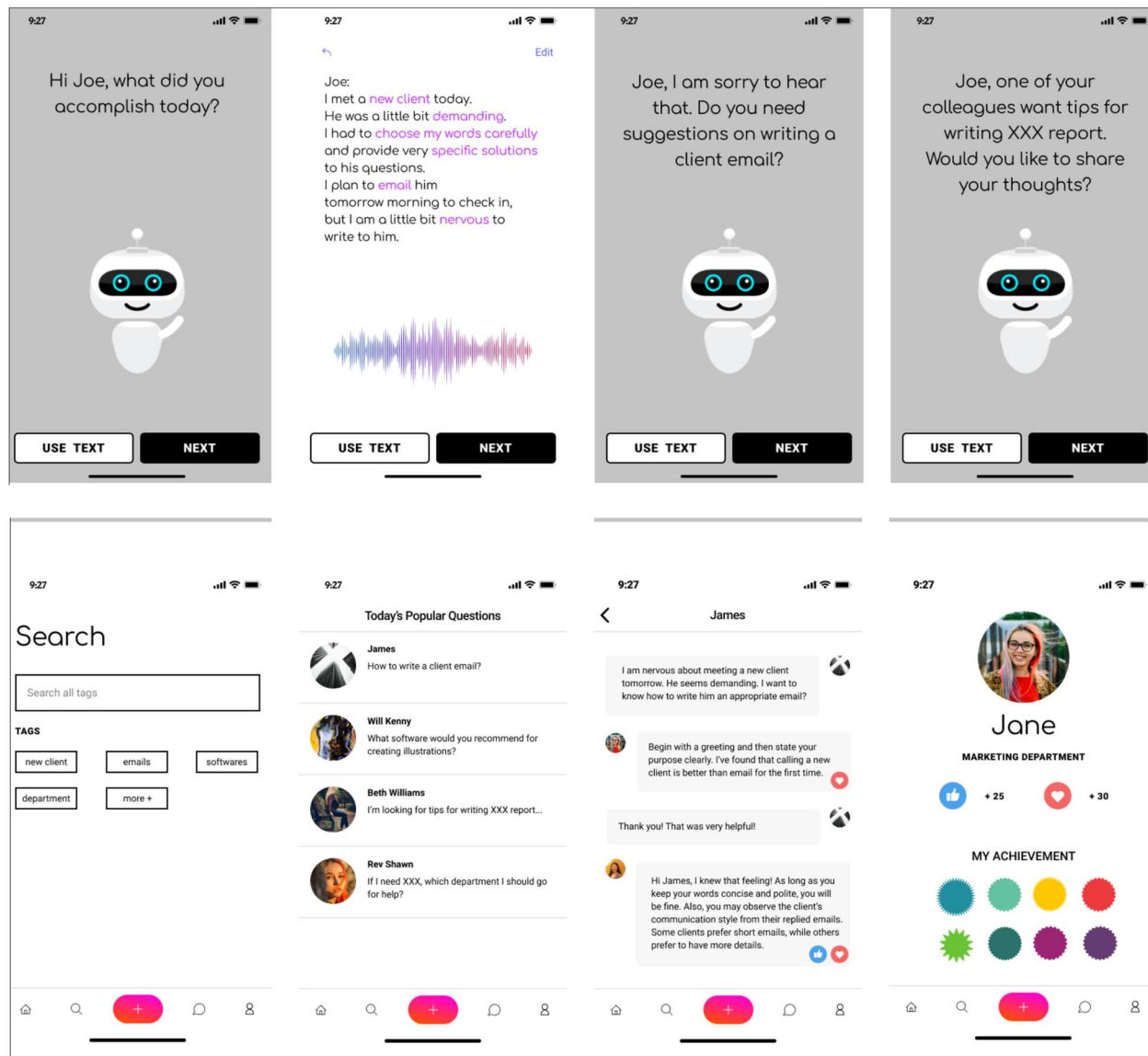


Figure 2. *An illustration of the initial chatbot design.*

Note. Reprinted from “Designing a Hybrid Program to Utilize Tacit Knowledge,” by X. Li & Y. Feng, 2024, *Journal of Knowledge Management*, 28(2)

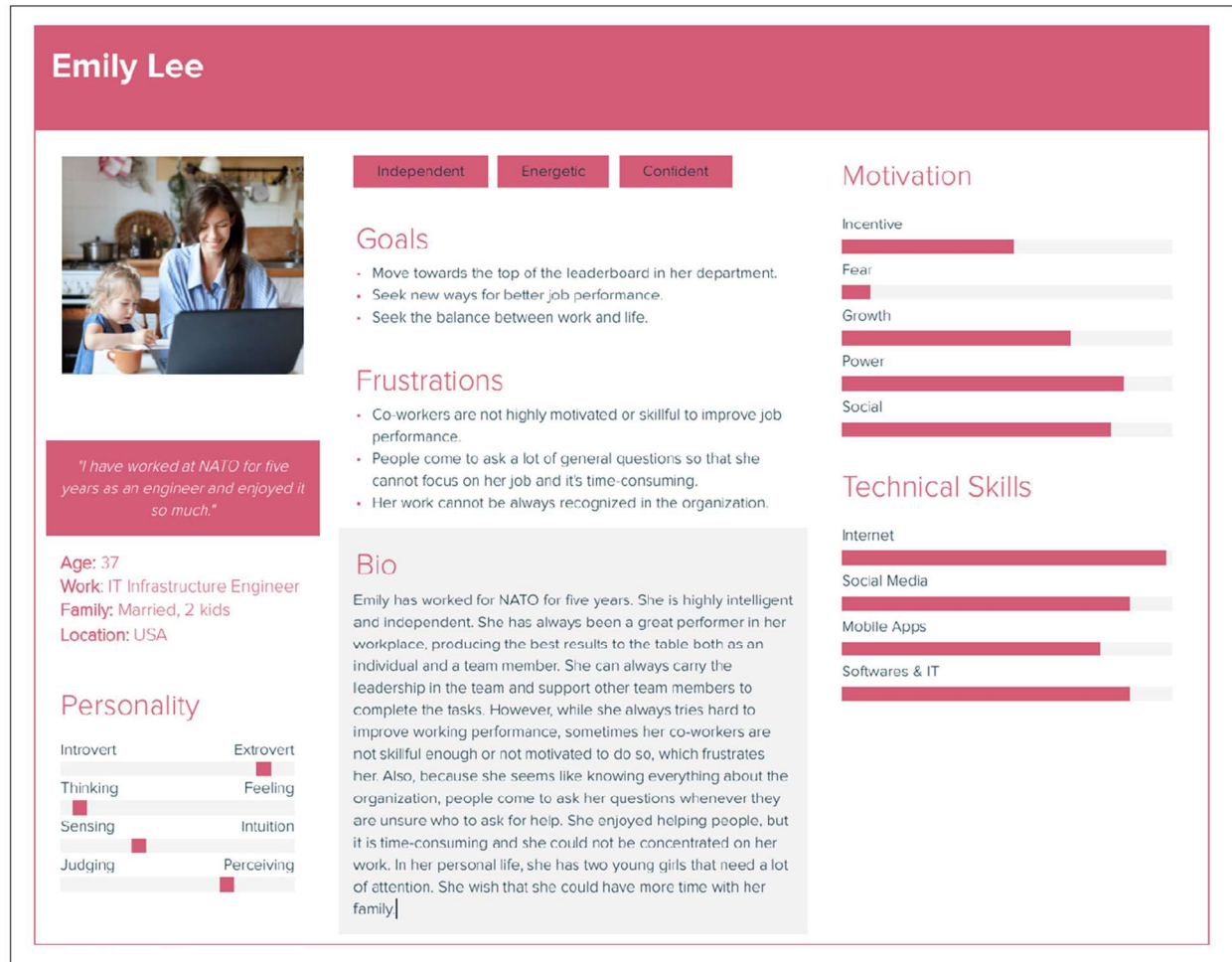


Figure 3. *An example of personas.*

Note. Reprinted from “Designing a Hybrid Program to Utilize Tacit Knowledge,” by X. Li & Y. Feng, 2024, *Journal of Knowledge Management*, 28(2).

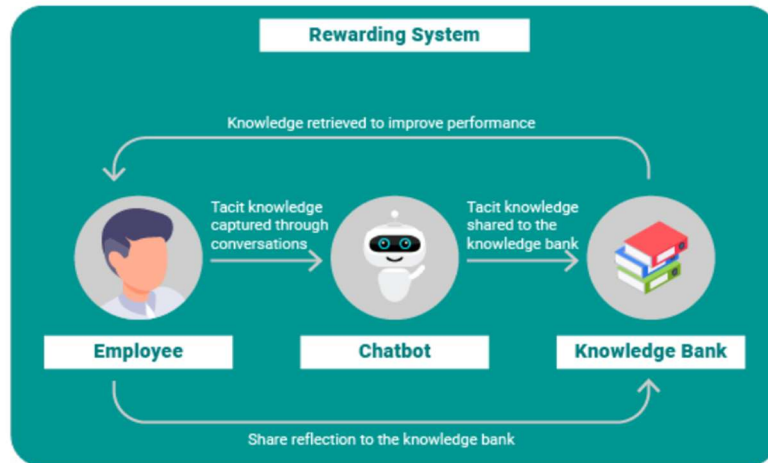


Figure 4. Overview of the chatbot intervention system.

Note. Reprinted from "Designing a Hybrid Program to Utilize Tacit Knowledge," by X. Li & Y. Feng, 2024, *Journal of Knowledge Management*, 28(2).



Figure 5. Using a chatbot to elicit tacit knowledge through a scaffolded reflection and video or photo capture.

Note. Reprinted from “Designing a Hybrid Program to Utilize Tacit Knowledge,” by X. Li & Y. Feng, 2024, *Journal of Knowledge Management*, 28(2).

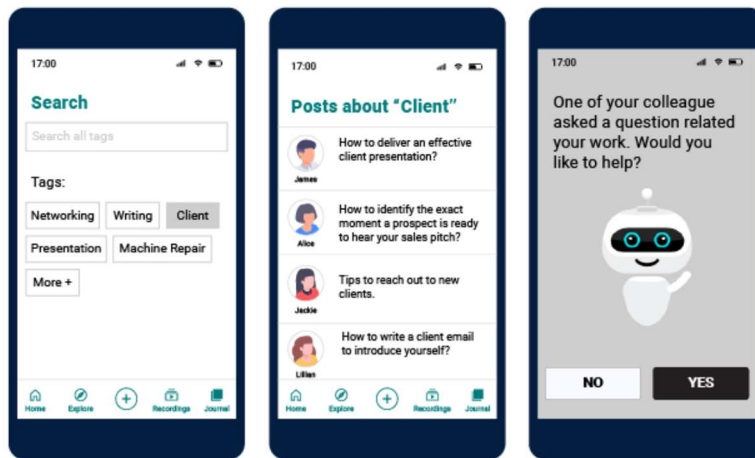


Figure 6. Using a knowledge bank to utilize captured knowledge by connecting resources.

Note. Reprinted from “Designing a Hybrid Program to Utilize Tacit Knowledge,” by X. Li & Y. Feng, 2024, *Journal of Knowledge Management*, 28(2).

4.2 Chatbots in Digital Organizations

Malekolkalami and Nazeri (2021) examine the use of chatbots in digital organizations, focusing on project-based environments where knowledge transfer is both essential and difficult to sustain. With nearly 40 percent of the global economy organized around projects, organizations must repeatedly move knowledge across temporary teams and avoid losing lessons when projects conclude. Traditional mechanisms often fail in this context, making chatbots a promising alternative.

The study distinguishes between digitization and digitalization. Digitization converts resources into digital formats, while digitalization transforms processes through digital tools. Chatbots fit the latter category because they prompt reflection, classify insights, and make tacit knowledge searchable in real time.

Initially used for operational tasks such as FAQs, chatbots have evolved into knowledge facilitators. They now classify inputs, support reflective dialogue, and connect employees to resources, supported by machine learning, NLP, and cloud infrastructure for scalability.

By embedding these capabilities, chatbots help capture tacit insights from short-lived teams, reduce redundancy by centralizing organizational memory, support decision-making with context-aware responses, and enhance collaboration among distributed employees. The study places them on a continuum from simple rule-based systems to advanced conversational agents, with the latter offering the strongest potential to transform unstructured inputs into organizational knowledge assets.

4.3 NLP Pipeline for Tacit Knowledge Conversion

Zaoui, Lazaar, and Al Achhab (2025) provide one of the most technical contributions by examining how natural language processing (NLP) can convert tacit knowledge into usable organizational assets. Tacit knowledge often exists in semi-structured formats such as conversations, reflections, or reports, which require transformation before they can be integrated into knowledge management systems. NLP pipelines serve as mediators in this process, translating raw narratives into structured forms.

Their proposed pipeline involves several stages, including cleaning and standardizing text, identifying key entities, and applying sentiment and semantic analysis to capture meaning.

These processes make employee reflections searchable, tagged, and ready to be linked across organizational repositories. The system also enables clustering and recommendations, helping organizations detect patterns and surface insights that may otherwise remain hidden.

However, there are still challenges that come along. Ambiguity in language, sarcasm, and cultural idioms reduces accuracy, while processing large datasets demands significant resources. Domain-specific ontologies are also needed to interpret specialized workplace language. Even with these limitations, the study shows that NLP can strengthen chatbot systems by making tacit knowledge more visible, actionable, and reusable.

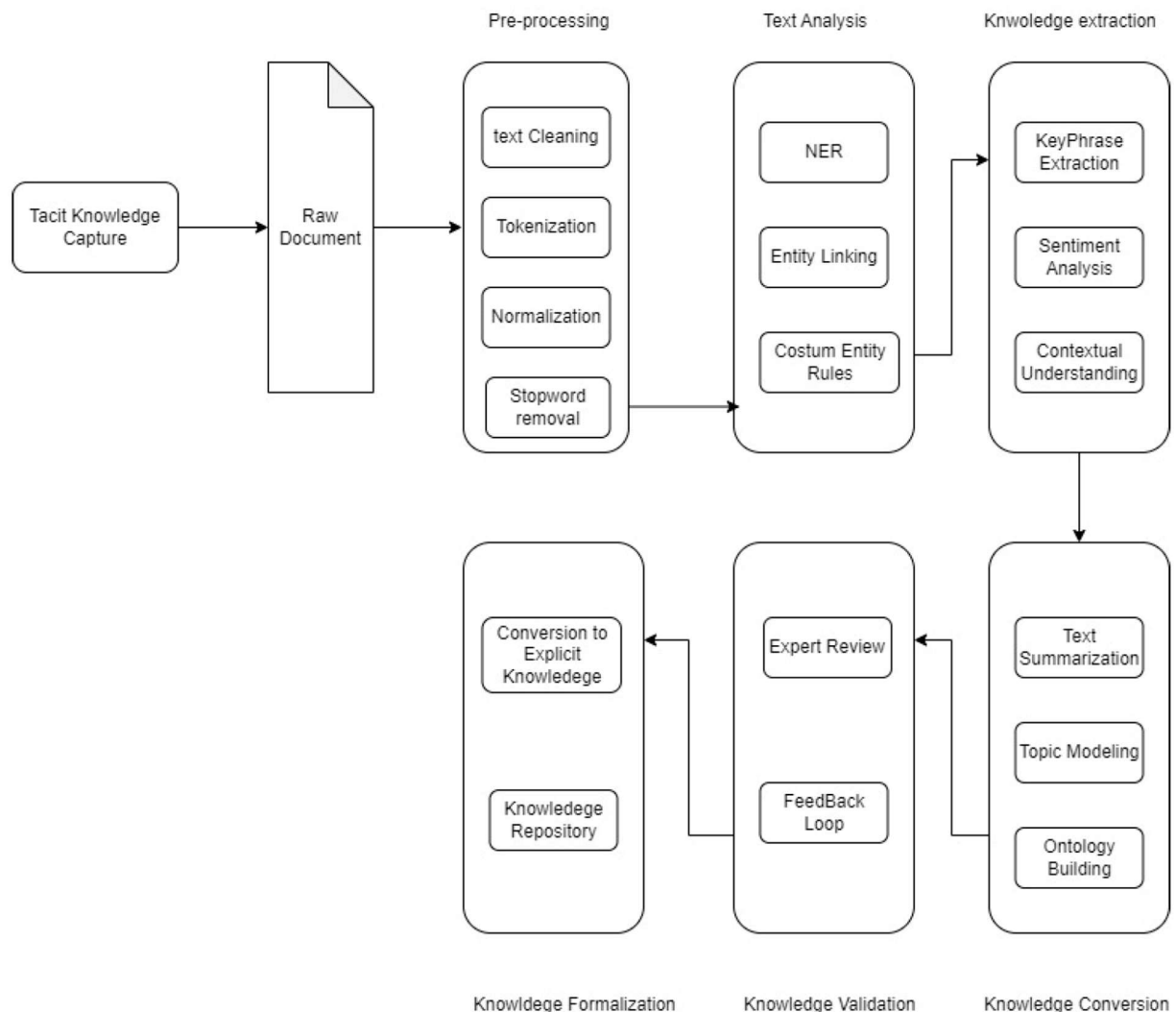


Figure 7. *The proposed NLP pipeline for tacit knowledge conversion.*

Note. Reprinted from “Using AI and NLP for Tacit Knowledge Conversion in Knowledge Management Systems: A Comparative Analysis,” by O. Zaoui, M. Lazaar, & M. Al Achhab, 2025, *Journal of Knowledge Management*.

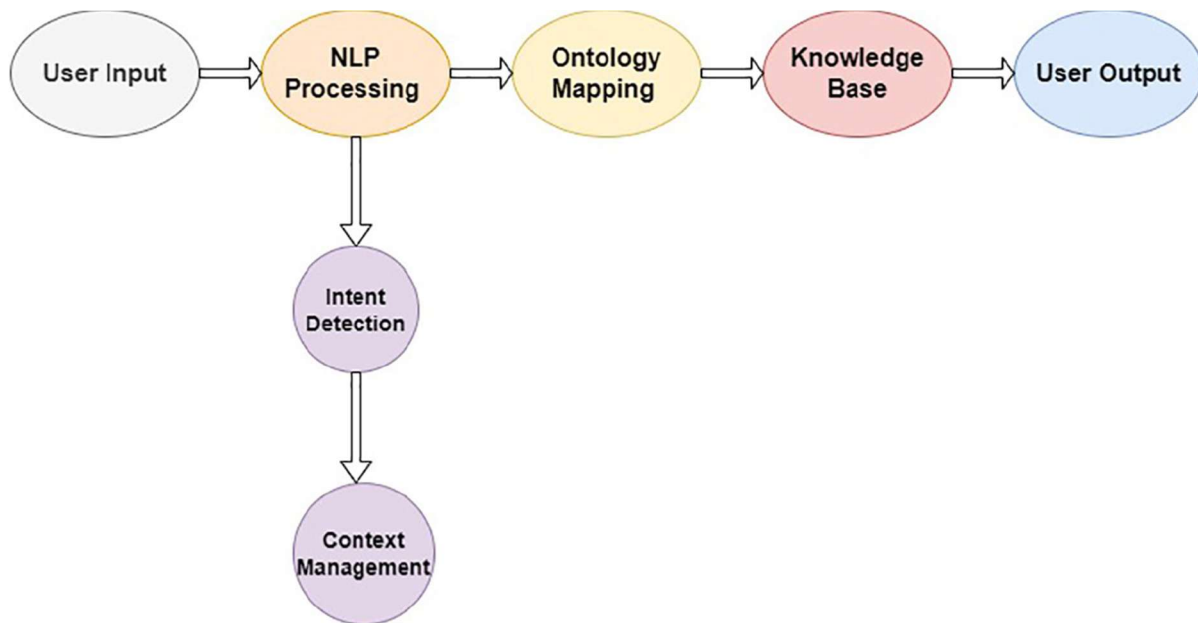


Figure 8. *The process of NLP and ontology for converting tacit knowledge into explicit knowledge.*

Note. Reprinted from Systematic Review and Framework for AI-Driven Tacit Knowledge Conversion Methods and Machine Learning Algorithms for Ontology-Based Chatbots in E-Learning Platforms, by O. Z. Seghroucheni, M. Lazaar, & M. Al Achhab, 2025, *International Journal of Interactive Mobile Technologies (iJIM)*, 19(1).

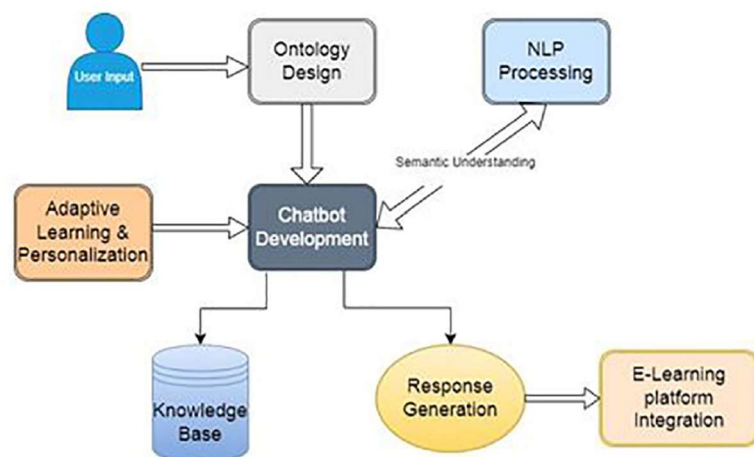


Figure 9. The proposed framework for implementing an ontology-based chatbot for tacit knowledge conversion in an e-learning platforms.

Note. Reprinted from Systematic Review and Framework for AI-Driven Tacit Knowledge Conversion Methods and Machine Learning Algorithms for Ontology-Based Chatbots in E-Learning Platforms, by O. Z. Seghroucheni, M. Lazaar, & M. Al Achhab, 2025, *International Journal of Interactive Mobile Technologies (iJIM)*, 19(1).

4.4 Intergenerational Tacit Knowledge Transfer

Falckenthal, Au-Yong-Oliveira, and Figueiredo (2025) examine how artificial intelligence can support the transfer of tacit knowledge across generations. This issue is critical because senior employees often hold rich experiential knowledge that is rarely documented, and organizations risk losing it as they retire or transition.

The study positions chatbots as mediators between generations. Senior employees are more comfortable with mentoring and storytelling, while younger employees prefer digital tools. Chatbots bridge these preferences by capturing reflections from older workers in conversational form and making them accessible to younger employees through searchable, tagged entries.

Motivational alignment is also important. Gamification features engage younger employees, while recognition reassures senior workers that their contributions will endure. By appealing to both groups, chatbots reduce generational barriers to knowledge sharing.

The authors emphasize that intergenerational transfer requires a hybrid approach. Chatbots alone cannot replace mentorship, but when paired with traditional practices, they help preserve critical insights and make them broadly available. Challenges remain, such as ensuring usability for older employees with lower digital fluency and overcoming cultural skepticism toward AI. Even so, the study concludes that AI-powered chatbots are valuable tools for preventing knowledge drain, breaking down silos, and strengthening organizational learning.

4.5 From HAL to Generative AI in Knowledge Management

Feng (2024) traces the evolution of artificial intelligence from early fictional representations such as HAL 9000 in *2001: A Space Odyssey* to modern generative AI chatbots. This historical perspective shows how organizational AI has moved from rule-based automation to systems designed to support knowledge processes.

Earlier approaches worked well with explicit data but struggled to capture the richness of tacit knowledge. Generative AI represents a turning point because large language models can create context-aware dialogue, synthesize information from multiple sources, and prompt users to articulate experiential insights. In this way, chatbots have shifted from simple retrieval tools to collaborative knowledge partners that transform reflections into actionable organizational memory. Feng describes this transition as a move from automation to augmentation, where AI enhances human knowledge work rather than replacing it.

The study also introduces the CARE framework, which stands for Collaboration, Adaptation, Reflection, and Engagement. This framework highlights that the impact of generative chatbots is cultural as well as technical. When embedded into daily workflows, they encourage new patterns of interaction that make knowledge sharing more natural and collaborative.

Challenges remain, including bias, hallucination, privacy concerns, and the risk of over-automation that could reduce reflective practice. Nevertheless, Feng concludes that when designed responsibly, generative chatbots can serve as dynamic platforms for organizational learning, strengthening the capture and sharing of tacit knowledge.

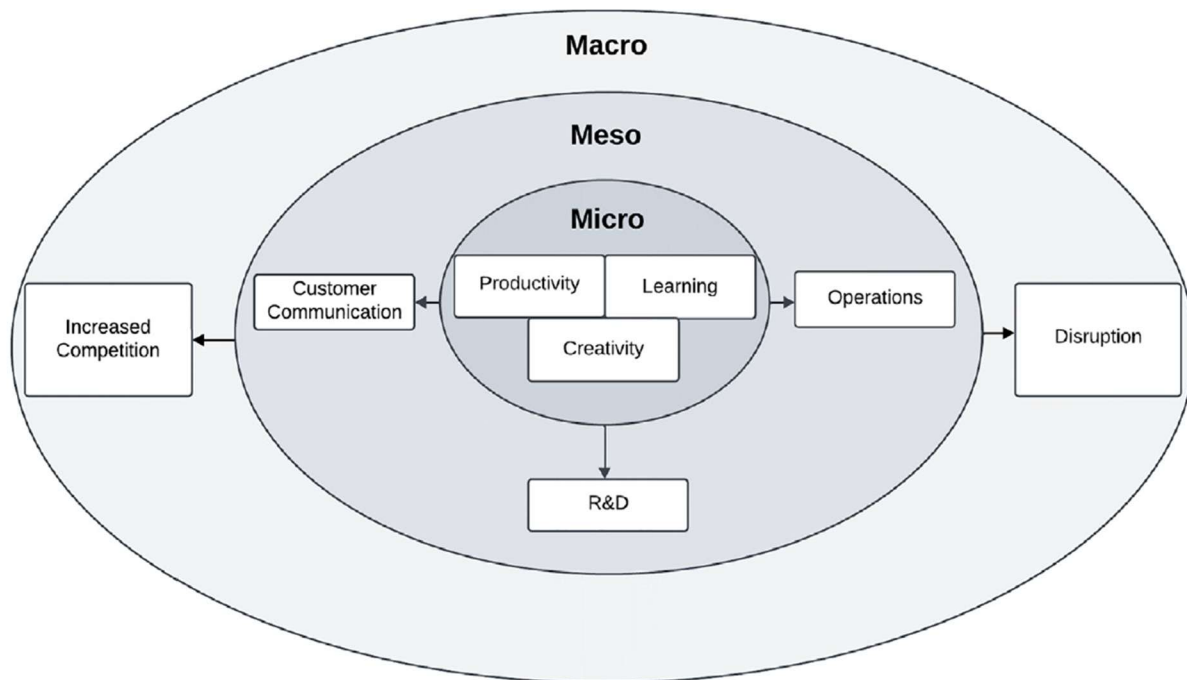


Figure 10. *Impact of GenAI chatbots on business.*

Note. Reprinted from “From HAL to GenAI: Optimizing Chatbot Impacts with CARE,” by C.

M. Feng, 2024, *Journal of Knowledge Management*.

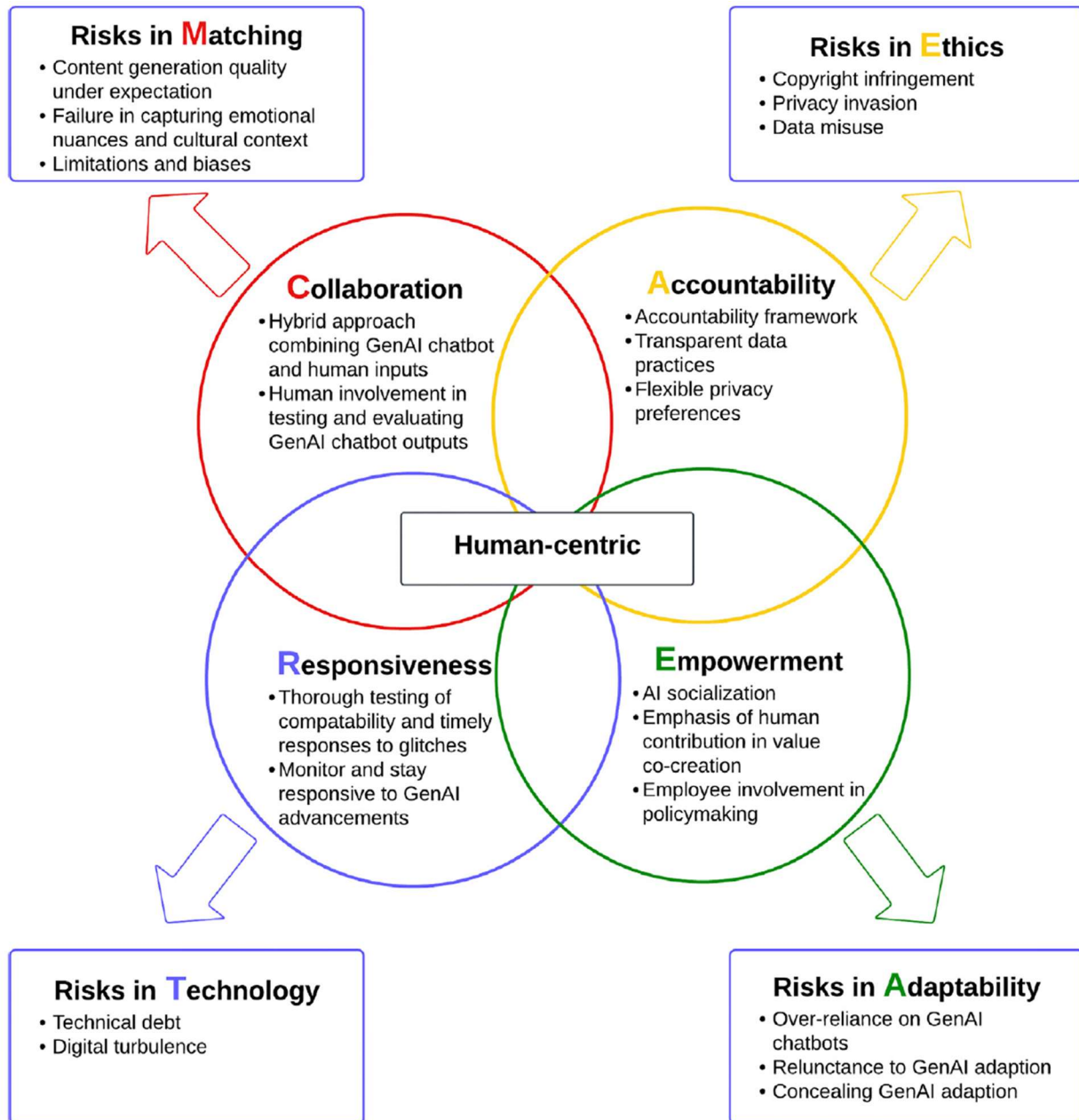


Figure 11. CARE framework mitigation META risks.

Note. Reprinted from “From HAL to GenAI: Optimizing Chatbot Impacts with CARE,” by C. M. Feng, 2024, *Journal of Knowledge Management*.

4.6 Generative AI Chatbots and Personal Knowledge Management

Capelli and Fusco (2024) examine how generative AI chatbots are reshaping personal knowledge management practices in organizational contexts. Traditional PKM relied on individual methods such as note-taking, bookmarking, or personal databases. These approaches were often fragmented and limited in value for collective sharing. Generative chatbots represent a shift because they blur the line between personal and organizational knowledge, enabling individuals to contribute tacit insights more seamlessly to shared systems.

These chatbots serve as personal knowledge assistants that engage in dialogue, summarize documents, and make context-aware recommendations. Unlike earlier reactive tools, they actively support reflection by asking clarifying questions, prompting elaboration, and synthesizing fragmented inputs into coherent structures. This directly supports tacit knowledge capture by helping individuals articulate experiential insights that might otherwise remain unspoken.

Practical applications include organizing daily reflections that feed into organizational repositories and contextualizing information across multiple projects to support decision-making. For example, a manager can ask a chatbot to compare outcomes across initiatives, drawing on both explicit reports and tacit reflections. In this way, personal interactions with chatbots contribute directly to organizational knowledge.

Generative chatbots also reduce the effort required for knowledge sharing by structuring and integrating insights automatically, which helps sustain motivation. However, risks remain. Heavy reliance may weaken employees' reflective skills, and the opacity of large language

models raises concerns about accuracy and bias. Capelli and Fusco conclude that chatbots should enhance rather than replace human judgment, ensuring PKM remains active and reflective.

Overall, the study shows that generative chatbots extend tacit knowledge capture beyond organizational systems into personal routines. By linking individual reflections with collective repositories, they create a continuous loop that strengthens the overall knowledge management ecosystem.

4.7 Integrating Conversational AI into Knowledge Management Systems

Kaur et al. (2022) examine how conversational AI can be embedded into enterprise knowledge management systems. They argue that the real value of chatbots lies not in standalone applications but in their integration with the platforms employees already use for collaboration, documentation, and decision-making.

The study identifies three core functions that make integration effective. First, chatbots act as gateways to repositories by processing natural language queries, which lowers barriers to accessing information. Second, they prompt employees to share reflections in the moment, capturing tacit knowledge closer to the point of action. Third, they synthesize inputs from multiple contributors into coherent summaries and recommendations, adding value beyond simple retrieval.

From a technical standpoint, integration depends on scalable cloud infrastructure and data frameworks that ensure security and accessibility across distributed teams. Linking chatbots with ERP, CRM, and other KM tools prevents silos and embeds knowledge directly into organizational workflows.

The authors position conversational AI as both a front-end interface that makes knowledge processes accessible and a back-end integrator that organizes captured insights through databases, ontologies, and big data pipelines. This dual role highlights the importance of designing chatbots as nodes in a broader ecosystem of learning rather than as isolated tools.

The study concludes that well-integrated chatbots improve both efficiency and inclusivity. Employees of different technical backgrounds can engage through familiar conversational interfaces, while organizations benefit from a continuous flow of tacit and explicit insights. Remaining challenges include ensuring interoperability, addressing privacy concerns, and maintaining trust in AI outputs. Still, the findings suggest that when embedded effectively, chatbots move beyond novelty to become central enablers of knowledge management.

4.8 Cognitive Assistants for Knowledge Sharing

Freire et al. (2023) investigate the use of cognitive assistants, conversational agents similar to chatbots, to support tacit knowledge sharing among factory operators. Unlike office-based workers, operators rely on experiential and context-specific skills that are rarely documented, which creates a risk of knowledge loss when employees rotate or retire.

The study shows that cognitive assistants can capture this expertise by engaging operators through natural language interfaces. Workers can query the system for troubleshooting help while also contributing their own reflections, which are stored and tagged in a repository that blends explicit instructions with tacit observations. This conversational format lowers barriers to contribution and makes it easier for operators to articulate insights that might otherwise remain undocumented.

Benefits include reduced downtime through quicker troubleshooting and improved training by giving new operators access to accumulated experience in conversational form. In this way, cognitive assistants act as both retrieval tools and bridges for intergenerational knowledge transfer.

Certain challenges are still present. Some operators viewed contribution as an extra task or feared that automation might devalue their expertise. Others questioned whether AI could fully capture nuanced, situational knowledge. These concerns align with broader findings that chatbots must be paired with cultural strategies and offline practices to gain legitimacy (Li & Feng, 2024; Falckenthal et al., 2025).

Freire et al. conclude that cognitive assistants are valuable but partial solutions. They extend access to tacit knowledge and support retention, yet their success depends on thoughtful integration into workplace routines and trust-building with employees. Rather than replacing mentorship, they work best as collaborative partners that amplify the expertise of operators.

4.9 Intelligent Assistants for Shop-Floor Workers

Shah et al. (2023) explore how intelligent assistants can elicit tacit knowledge from shop-floor employees who rely heavily on experiential, hands-on skills that are rarely documented. This creates an ongoing challenge, as critical expertise may be lost when workers change roles or leave.

The study introduces a prototype designed to prompt workers with context-sensitive questions during or immediately after tasks. These prompts encourage employees to explain their reasoning, highlight workarounds, and capture situational insights. By embedding the assistant directly into workflows, knowledge is collected in real time with minimal disruption.

Captured inputs are processed through tagging and classification to form a repository that blends procedural instructions with experiential knowledge. New employees can query the assistant for both step-by-step guidance and insights contributed by senior colleagues, making it a valuable training resource and reducing reliance on informal shadowing.

The findings point to several benefits. Intelligent assistants lighten cognitive load by automating the structuring of tacit inputs, give all employees a platform to contribute regardless of seniority, and help managers detect recurring patterns across shifts and locations.

Challenges remain in adoption and trust. Some workers doubted whether tacit insights could be adequately captured, while others feared their expertise would be undervalued once codified. Shah et al. stress that successful implementation requires designs that respect employee agency and reinforce the enduring value of human expertise.

Overall, the study shows that intelligent assistants extend the reach of conversational AI into one of the most knowledge-intensive yet under-documented areas of industrial practice. By embedding reflective prompts and integrating captured insights into repositories, they help preserve and share shop-floor expertise in sustainable ways.

4.10 Systematic Review and Framework for AI-Driven Tacit Knowledge Capture

Al-Kahtani et al. (2024) provide a systematic review of recent research on artificial intelligence in tacit knowledge management, culminating in a conceptual framework for AI-driven knowledge capture. Unlike single case studies, their work consolidates findings across applications such as conversational agents, intelligent assistants, machine learning models, and natural language processing pipelines.

The review identifies a shared theme: tacit knowledge is increasingly seen as a vital resource, yet traditional methods such as mentorship and manuals are inadequate in digital workplaces. AI-powered systems, especially chatbots, are presented as scalable solutions that lower barriers to contribution and make tacit insights more accessible across organizations.

The proposed framework has three layers. The interaction layer involves chatbots that elicit reflections and narratives from employees. The processing layer applies NLP and machine learning to clean, classify, and analyze inputs. The integration layer embeds processed knowledge into organizational repositories and workflows, ensuring it is reusable and actionable. This layered approach situates chatbots as central enablers but emphasizes that they must work alongside other AI techniques and enterprise systems.

Challenges include ambiguity in natural language, privacy and bias concerns, and cultural resistance to sharing. The review also highlights opportunities for hybrid approaches where AI systems are complemented by offline practices such as mentoring and peer learning. This reinforces earlier case studies, which showed that chatbots are most effective when paired with human-centered strategies.

Al-Kahtani et al. conclude that AI-driven tacit knowledge management is advancing toward maturity. While barriers remain, the trajectory of research points to a future where tacit knowledge capture is seamlessly embedded into organizational life through the combined use of conversational AI, NLP, and integrative KM architectures.

5. Challenges and Limitations in Implementing Chatbots for Tacit Knowledge Management

Even with promising results, bringing chatbots into tacit knowledge work comes with hurdles. One challenge is motivation. Reflection-based systems often feel like extra work,

especially when employees do not see immediate personal benefit. Early enthusiasm fades if prompts feel repetitive or if contributions go unrecognized. While gamification and rewards can spark interest, what truly sustains participation is genuine acknowledgment and the sense that sharing knowledge matters.

Access and digital literacy create another barrier. Long-tenured experts, workers in noisy or hands-on environments, and multilingual teams may struggle with mobile or multimedia tools. Programs that gain the most traction pair chatbots with mentoring sessions or informal forums, creating multiple pathways for people to contribute comfortably.

Trust and quality also play a role. Tacit stories are often partial and tied to context. If they are captured verbatim, they risk being treated as universal rules. Employees want reliable information when decisions carry weight. This makes validation essential. Simple practices such as peer endorsements, curator notes, or links to formal procedures can preserve nuance while ensuring credibility.

Technical limits add another layer of difficulty. Natural language processing struggles with ambiguity, slang, and specialized jargon. Algorithms can tag and summarize, but they cannot fully grasp why a worker chose an unusual approach. Effective systems treat the chatbot as a collector and organizer, while keeping access to the original narratives and human experts.

Integration is equally important. Chatbot conversations that remain isolated from workflow tools end up creating silos rather than breaking them down. Strong implementations connect to identity systems, document repositories, and learning platforms so that insights appear where people actually work. Scaling also introduces governance concerns such as who can see sensitive reflections, how long they should be stored, and under what consent. Generative AI

brings further questions about bias, hallucination, and explainability. These require safeguards and transparency so users can decide when to rely on the system and when to seek human input.

Culture shapes adoption as much as technology. In some organizations, expertise is closely guarded, while in others, a history of surveillance creates reluctance to share. Programs that succeed are those where leaders participate visibly, communities moderate discussions, and contributions are framed as building legacy and influence rather than giving something away. Change management also matters. Onboarding rituals, team champions, and visible feedback showing how knowledge is used help create a sense of reciprocity.

The final challenge is the risk of over-automation. If chatbots take over sense-making, employees may engage in less reflection themselves. Scholars caution against positioning them as replacements for dialogue. Their best role is as amplifiers, making conversations easier to find and share while organizations continue to foster mentorship, shadowing, and storytelling that keep tacit skills alive.

6. Recommendations and Future Directions

The ten studies suggest that chatbots are most effective when they are part of a larger program that combines technology, people, and organizational systems.

One principle is to design prompts that fit naturally into the flow of work. Reflections should be short, varied, and sensitive to context so that they capture the reasons behind actions and not just the steps. Offering several ways to contribute, including voice, text, photos, or videos, makes participation easier for employees in different roles. Timing is equally important. Fewer prompts during busy periods and richer prompts after unusual events help maintain goodwill. Contributors should always see value in their input, whether through a brief summary,

links to related cases, or a suggestion to consult a colleague. When employees can see how their reflections are used and by whom, their motivation becomes stronger and more enduring.

Participation also relies on accessibility. Interfaces must be simple enough for long-tenured experts who may be less comfortable with digital tools, while also working well for those in noisy or hands-on environments. Providing both voice and text options, localized prompts in the languages that teams use, and shared devices with low-friction input ensures that valuable insights are not excluded. Pairing digital capture with mentoring sessions or informal forums reinforces that the program values people and not only the data they provide. In workplaces where generations overlap, positioning participation as a way to build legacy and pairing senior experts with younger digital stewards encourages both knowledge sharing and reflective practice.

Technical design is another key factor. Captured conversations should flow into trusted repositories that include clear cues about source, scope, and reliability. A practical natural language processing system can clean and structure narratives while retaining context. Generative tools provide the best results when they are grounded in trusted sources and when their summaries link back to the original reflections. Light moderation helps the knowledge base evolve without becoming cluttered. In safety-critical situations, a two-step process that combines machine-generated summaries with human review creates transparency about confidence and reliability.

Trust in the system depends on clear governance. Contributors need to know who can view their reflections, how long entries will be stored, and what protections are in place for sensitive information. Usage metrics should focus on learning outcomes such as faster onboarding, fewer repeated mistakes, and shorter decision cycles rather than individual

productivity tracking. A clear ethics charter that outlines acceptable use, safeguards for generative tools, and processes for correction builds legitimacy and lowers the social cost of contribution.

Implementation works best when it begins with a focused pilot. A trial in a well-defined workflow allows teams to co-design prompts, calibrate timing, and fine-tune the knowledge base with rapid feedback. Local champions who have both credibility and dedicated time for curation can accelerate adoption more effectively than directives from leadership. Once established, programs can expand across related workflows and connect with enterprise systems so that knowledge appears directly within the flow of daily work. Sharing stories of impact, such as when a reflection prevented a defect or improved a design, reinforces the value of contributing.

Future opportunities include embedding chatbots into daily tools so they can suggest reflection at natural moments. They may also generate initial drafts from logs or photos while keeping authorship clear. Advances in language analysis could highlight moments when coaching or mentoring might help, though such features must remain optional and respectful of privacy. Multilingual capabilities can expand participation in global teams, while on-device processing can help industries that require strict data control. Comparative research across different settings, such as project teams, factories, and service organizations, will refine common measures of success, including speed of onboarding, reduction in repeated incidents, and the diversity of contributors.

In summary, effective programs weave human practices with technical support. Chatbots reduce the effort needed to capture stories, transform them into reusable forms, and make them easy to find and adapt. When programs are designed for inclusion, integrated into daily routines,

governed with transparency, and evaluated on meaningful learning outcomes, chatbots become a lasting way to capture and share tacit knowledge.

7. Conclusion

This paper explored how AI-powered chatbots can capture and share tacit knowledge, the experiential and context-bound know-how that is vital to organizational performance yet often at risk of being lost. Drawing on the peer-reviewed studies, the discussion moved from foundational theories of knowledge to the evolution of conversational systems and into practical applications in digital, project-based, and industrial settings. Together, the studies show that chatbots shift knowledge management away from static repositories and toward living conversational spaces where everyday problem-solving becomes visible, shareable, and reusable. When employees are prompted at the right moments to explain both what they did and why, organizations are able to convert fleeting insights into assets that travel across teams and generations.

Technically, this process relies on natural language processing pipelines that transform unstructured narratives into structured and searchable artifacts without losing context. Tools such as preprocessing, entity recognition, semantic analysis, and retrieval-augmented generation allow conversational reflections to be recombined with formal procedures and operational data. Organizational value arises when these conversational records are woven into the platforms where people already work, so that relevant experience appears precisely when and where it is needed.

The studies also highlight that chatbots succeed when they are part of broader socio-technical programs rather than standalone tools. When conversational capture is paired with

mentoring, informal exchanges, and community curation, participation widens, provenance becomes clearer, and reuse is safer. Chatbots preserve the voice and detail of tacit knowledge, while human practices sustain judgment and context. Inclusive prompts, simple input flows, and local champions encourage contributions, while clear governance around privacy and consent builds trust that keeps the system active.

Limitations are still existing. Models still struggle with ambiguity, cultural nuance, and evolving jargon. Over-automation can weaken reflective practice, and organizational cultures that equate expertise with personal power may discourage sharing. Yet across the studies, the trajectory is consistent. With inclusive design, strong integration into daily workflows, careful governance, and a clear role as augmentation rather than replacement, chatbots can become a durable infrastructure for organizational learning. They lower the effort required to share stories, carry those stories to the places where they matter most, and preserve a clear trail back to the people who created them.

The strategic opportunity is not only to capture knowledge but to cultivate a conversational knowledge commons where everyday experience is continuously rendered visible, accessible, and useful. Organizations that invest in such a commons can expect faster learning, fewer repeated mistakes, quicker decisions, and more collaboration across boundaries. As generative systems mature and privacy-preserving multilingual pipelines become standard, the vision extends further: a living memory that respects the richness of tacit expertise while making it equitably available to those who need it.

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Appendix: Questions Asked to AI Writing Assistant

1. Please check my grammar.
2. What is a professional way to say this?
3. Can you shorten this paragraph without losing meaning?
4. How do I transition smoothly between sections in an academic paper?
5. Can you walk me through this concept in more detail?
6. Please explain the SECI model of knowledge creation.
7. What is tacit knowledge and why is it described as hidden or invisible?
8. How does Nonaka's SECI model apply to chatbot-based knowledge management?
9. Can you explain how natural language processing (NLP) works in chatbot design?
10. What are the stages of an NLP pipeline and how do they support tacit knowledge capture?
11. What is ontology modeling and how does it relate to knowledge management systems?
12. How do deep learning and adaptive learning frameworks improve chatbot performance?
13. How do generative AI chatbots capture and share tacit knowledge?
14. What are the main limitations of NLP in processing tacit knowledge?
15. How do chatbots help with intergenerational knowledge transfer?
16. How does organizational culture influence whether employees share tacit knowledge?
17. What are the ethical risks of using generative AI chatbots for knowledge management?
18. How can gamification increase motivation in chatbot systems?
19. What is retrieval-augmented generation (RAG) and how does it help reduce hallucinations in chatbots?
20. How can chatbots be designed to encourage employees to reflect rather than just report?

21. What role does trust play in whether workers contribute tacit knowledge to a chatbot system?
22. How does chatbot integration with ERP or CRM systems improve organizational learning?
23. In what ways can generative AI chatbots complement, rather than replace, mentorship programs?
24. What metrics can organizations use to evaluate the success of chatbot-based tacit knowledge capture?