Solution Pathways to the Issues of the Business Knowledge Management Based on the Artificial Intelligence Technology

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Abstract. Today, the business knowledge has been emerging with an unprecedented speed. The business knowledge management is becoming more and more complicated. Luckily, with the artificial intelligence growing fast, the artificial intelligence technology is being developed more quickly than ever before. It provides feasible solution tracks to solve the difficult issues of the business knowledge management. What tracks they are and how they influence the business knowledge management are worthy to be further studied. Therefore, the paper combs the categories of the business knowledge, the connotation of the business knowledge management, the current concerned artificial intelligence technology and the relationship between the business knowledge management and the artificial intelligence technology, finds out the relative problems of the business knowledge management in the conditions of the artificial intelligence, and then puts forward some pathways to manage the business knowledge in the aid of the artificial intelligence technology so that the business knowledge management may be raised in the efficiency and effectiveness.

Keywords: business knowledge management, artificial intelligence technologies, solution pathways

1 Introduction

In the era of the information explosion today, with the increasing data and enhanced computing power, artificial intelligence (AI) technologies are playing a crucial role in the business management and permeating various aspects such as strategic management[1], business models[2], organizational behavior & human resource management[3], innovation management, marketing management, and operations management[4]. The penetration of AI is becoming increasingly widespread and profound, and making enterprises encountering unprecedented challenges in the knowledge management and utilization[5], as the speed of knowledge production far outpaces the efficiency of systematic management.Traditional knowledge management methods, such as document management systems and training manuals and so on, have inherent limitations as follows:

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First, static nature: Difficulty in capturing dynamically evolving expertise ,e.g., engineers temporary solutions for new equipment failures.

Second,low interactivity: Employees must actively search for knowledge, lacking a knowledge-finds-people approach.

Third, high cognitive load: Tacit knowledge requires manual interpretation,e.g., obscure technical reports.

Breakthroughs in AI technologies,such as natural language processing (NLP), computer vision, and reinforcement learning, have introduced a new paradigm for the knowledge management, shifting from a store-retrieve model to an intelligent sense-reason-recommend closed loop.

In this way, the digital transformation in the business has become imperative, which refers to the adoption of AI technologies to optimize business processes, enhance efficiency, reduce costs, and improve competitiveness[6]. Among its key aspects, the knowledge management is paramount, as the knowledge is the core of business competitiveness. However, with the rapid development of big data, cloud computing, and AI, traditional knowledge management models can no longer meet business demands in the efficient information processing and innovative applications. Therefore, integrating AI into business knowledge management systems has emerged as a revolutionary approach in the knowledge process and use[7].

2 Use of the AI Technology in the Business Knowledge Management

2.1 AI Technologies and Knowledge Management

AI is a discipline focused on enabling machines to exhibit human-like intelligence. Its primary objectives include empowering machines to understand natural language, autonomously learn from experience to extract knowledge, and solve complex problems. It can be categorized into the following sub-fields:

a) Machine learning (ML): A data-driven approach that allows machines to autonomously identify patterns from data and apply them to problem-solving.

b) Deep learning (DL): A neural network based on ML method may enable machines to learn intricate features from vast datasets for advanced problem-solving.

c) Natural language processing (NLP): A computational technique to process human language, allow machines to interpret and utilize natural language in practical applications.

d) Computer vision: A methodology for machines to analyze and comprehend images and videos, facilitate tasks like object recognition and scene understanding.

In the Knowledge management (KM), AI delivers five core functions like knowledge acquisition, storage, sharing, application, and innovation. Currently, knowledge graphs and NLP are the dominant technologies driving these capabilities.

The knowledge management is a methodology that transforms human expertise and experience into reusable knowledge. As a systematic process of knowledge creation, storage, sharing, and application within organizations, KM plays an important role in

enhancing the business competitiveness. It enables businesses to convert latent knowledge into valuable assets .

The core components of KM include knowledge discovery,namely converting internal and external data/information into actionable knowledge, knowledge storage, i.e,archiving knowledge in repositories for easy access and utilization by employees, knowledge sharing,that is to say,facilitating knowledge exchange among employees to elevate organizational intelligence and knowledge application, namely, leveraging knowledge in business operations to improve efficiency and competitive advantage.

However, traditional KM systems face limitations such as inefficient information filtering, delayed knowledge updates, and inadequate personalized services. AI technologies, particularly machine learning (ML), natural language processing (NLP), and knowledge graphs, offer robust solutions to these challenges, and empower enterprises to manage and deploy knowledge resources more intelligently and efficiently .

2.2 Relationship Between the Artificial Intelligence Technology and the Knowledge Management

During the digital transformation of the enterprise, the close links exist between the artificial intelligence and the knowledge management. The artificial intelligence can bring benefits to the enterprise in spotting knowledge and raising the efficiency of the finding out the knowledge among the massive data. In the meanwhile, the artificial intelligence can also help the enterprise make the knowledge storage, sharing and application automatic and raise the efficiency and effectiveness of the knowledge management. Therefore, the combination between the artificial intelligence and the knowledge management is the stage that can’t be missed in the business digital transformation.

3 Application of the Artificial Intelligence Technology in the Business Knowledge Management

Business knowledge management is a phased and hierarchical complex system. The application of artificial intelligence (AI) in various stages of knowledge management has significantly improved the efficiency of knowledge acquisition and organization, knowledge storage and structuring, knowledge sharing and dissemination, and knowledge application and innovation. Take it for example, Liu, Y., & Singh, P. V. (2021) studied how AI technology promoted the transformation of the tacit knowledge in the aircraft maintenance and concluded that AI might raise the service efficiency and reduce the error made by the person[8].

3.1 Knowledge Acquisition and Organization

AI enhances the efficiency and quality of knowledge acquisition through automated data collection and text mining techniques, enabling rapid extraction of valuable insights from vast amounts of information. Natural Language Processing (NLP) allows

machines to comprehend and parse unstructured text, transforming it into structured knowledge for better management and analysis. Additionally, knowledge graph technology constructs complex relationship networks between entities, facilitating deep integration and correlation of knowledge..

3.2 Knowledge Storage and Structuring

AI optimizes knowledge storage and organization through intelligent classification, tagging systems, and automated sum-up, and makes knowledge bases more structured and retrievable. For example, semantically awakening search engines not only match keywords but also interpret user intent and deliver more accurate search results.

3.3 Knowledge Sharing and Dissemination

AI-driven techniques such as social network analysis and recommendation systems enhance efficient knowledge sharing and dissemination. By analyzing employees' professional backgrounds and interests, smart systems can personalize content distribution and foster tailored knowledge transfer. Meanwhile, platforms like virtual communities and online workshops, integrated with intelligent matching algorithms can facilitate cross-departmental and cross-regional knowledge exchange and collaboration.

3.4 Knowledge Application and Innovation

By AI's predictive analytic and pattern recognition capabilities, enterprises can uncover deeper insights from knowledge to support decision-making, product innovation, and other critical activities. For instance, in R&D, AI can analyze market trends and predict user needs to guide new product development. In customer service, intelligent chat-bot systems provide rapid and accurate responses and improve service quality and efficiency.

4 Problems About the Application of the Artificial Intelligence Technology in the Business Knowledge Management

Because of the limited resources, the enterprise may encounter various problems in technology, management, ethic and laws that are "the moral principles companies use to guide responsible and fair development and use of AI"[9], etc in using the artificial intelligence technology to consolidate its competitiveness. The details are as follows:

4.1 Technical Challenges

a) Data quality and integration issues. Heterogeneous data compatibility: Internal data sources (e.g., CRM, emails, documents) vary in format (structured/unstructured) and

standards and require costly additional cleaning and processing in advance for AI models. Also, noise and redundant information: Automatically scraped or employee-uploaded data may contain irrelevant content (e.g., duplicate documents, outdated versions) and compromise knowledge base accuracy. Take it for example, a financial firm's AI failing to distinguish among similar report versions from different years will lead to erroneous analysis.

b) Semantic understanding limitations. Generic NLP models (e.g., ChatGPT) may misinterpret domain-specific terms (e.g., in law or healthcare)and necessitate customized training. Due to the lack of context, AI struggles to capture tacit knowledge ,e.g.,internal unwritten rules or project backgrounds,which may result in misaligned recommendations.

c) Dynamic update delays. Most knowledge graphs rely on static data,which may fail to reflect real-time external market shifts or internal policy updates,e.g. compliance databases lagging behind regulatory changes.

4.2 Returns of Investment(ROI) and Management Challenges

Cost and ROI dilemma. Customized AI model development, ongoing training, and computational costs, e.g. enterprise knowledge graphs are prohibitively expensive for SMEs. Benefits,e.g. decision-making efficiency are often long-term and intangible that may complicate short-term ROI justification and executive buy-in.

Management and security risks. Because of data silos and access conflicts, departmental isolation,e.g., R&D vs. sales systems, leads to incomplete AI inputs, while complex permission controls raise leakage risks, e.g. sensitive data exposure. Also,owing to low employee trust, resistance stems from fears of AI errors or job displacement,such as automated replies in the customer service replacing staff. Another issue is compliance risks: Automated collection of employee/customer data may violate GDPR, especially in cross-border operations,e.g. EU data being stored on non-compliant servers.

4.3 Ethical and Legal Concerns

a) Algorithmic bias amplification. Historical biases,e.g. gendered hiring documents learned by AI can perpetuate unfair recommendations. For example, Amazon's AI recruitment tool was scrapped for discriminating against women.

b) Ambiguous knowledge ownership. AI-generated content such as automated meeting summaries, lacks clear copyright attribution which risks legal disputes.

c) Human knowledge erosion. Over-reliance on AI may degrade core employee competencies like experiential judgment, innovation, and may foster AI dependency syndrome.

5 Solution Pathways to the Problems About the Application of the Artificial Intelligence Technology in the Business Knowledge Management

Generally, the business knowledge consists of explicit and tacit knowledge. Then the business knowledge management includes knowledge acquisition, storage, verification, share and transformation & innovation, etc. The solution to the problems of business knowledge management based on the artificial intelligence technology can effectively raise the level in the digital and intelligent business information, optimize the knowledge circulation efficiency and reduce the cost of operation. Besides, the conversion between the explicit knowledge and the tacit knowledge may generate some new ideas in avoiding the loss of the tacit knowledge from the individual and in encouraging the employee's innovation among the comprehensive solution framework based on AI technologies. The details of the framework is presented as Fig. 1:

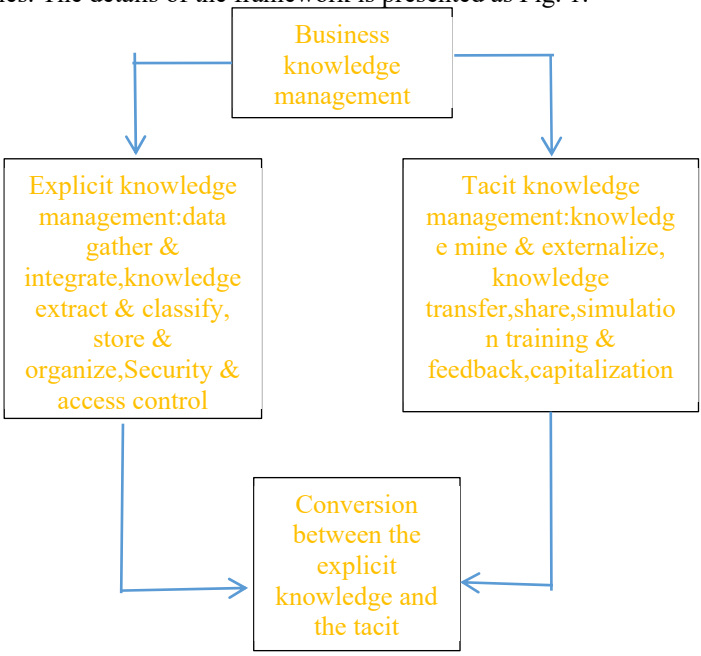

Fig. 1. Comprehensive solution framework based on AI technologies

5.1 Solution Pathways to the Problems of the Explicit Knowledge Management

Explicit knowledge refers to knowledge that can be clearly articulated, codified, and stored in formats such as text, images, or numbers like documents, manuals, databases, flowcharts. Unlike tacit knowledge such as personal experience, intuition, explicit knowledge is easily transferable and reusable,which makes it a core focus of enterprise knowledge management.

a) Multi-source data collection & integration. First, for the structured data, integrate ERP, CRM, and other business systems via APIs and database interfaces. As for the unstructured data,such methods can be adopted. For example, document parsing: Use OCR and NLP e.g., DeepSeek-V3's file upload feature to extract text from PDFs, Word, and PPT files. Then, audio/video processing: employ ASR (automatic speech recognition) and video analysis to transcribe meeting recordings. Next,web/social media crawling: Automatically scrape industry trends or competitor data.

b) Intelligent knowledge extraction & classification.The concrete approaches may be utilized. First, name entity recognition (NER): Extract key entities like people, companies, technical terms, etc. Second, topic modeling: use LDA or BERT to cluster documents, e.g. categorizing customer feedback into product improvement or service complaints. Third, sentiment analysis: detect positive/negative emotions in user reviews or employee feedback. Fourth, automated tagging: Apply BERT-based topic models to label documents like technical specs or financial policies.

c) Knowledge storage & organization. Some ways can be used. First, make knowledge base vector: use embedding models like Open AI's text-embedding-3 to convert documents into vectors stored in databases like Milvus, enabling semantic search, e.g., querying cost reduction retrieves relative supplier negotiation tactics. Second, Knowledge graph construction: Build entity-relationship networks as product-customer-supply chain by using NER and relation extraction. Third, knowledge retrieval & Q&A: one is hybrid search combining BM25 and vector similarity.Another is to deploy enterprise chat-bots powered by LLMs like DeepSeek-V3 to answer queries, for instance, how to apply for annual leave? with cited policy sources. Fourth, knowledge updates & recommendations: some measures can be taken. Fifth, automatic duplication & version control: track changes with the Git-style and flag duplicates via document similarity analysis. Sixth, life-cycle management: AI identifies outdated documents, e.g., unused for 3 years and prompts reviews. Seventh, streaming data processing: Use Kafka/Flink to ingest real-time news/market reports. Eighth, personalized recommendations: Push role-specific content, e.g., sales vs. R&D.

d) Security & access control.The way to solve the problem is as follows: first, data anonymize: Auto-detect and encrypt sensitive information like IDs, bank accounts by using regex + deep learning. Second, granular permissions:Take it for example, role-based ,e.g. HR accesses HR policies and context-aware ,e.g. project-specific document visibility.

5.2 Solution Pathways to the Problems of the Tacit Knowledge Management

Tacit knowledge refers to personal expertise, intuition, and insights that are difficult to articulate, such as craftsmanship, crisis decision-making, sales negotiation tactics,etc. Unlike explicit knowledge, it is highly individualized, slow to be transferred, yet critical to the competitive advantage. Its management faces the following key challenges. For instance, difficulty to be captured:Knowledge resides in individual minds with no standardized expression. High transfer cost: It requires mentor-ship or prolonged observation, hindering scalability. Attrition risk: Employee turnover leads to critical

knowledge loss like senior engineers' troubleshooting intuition. Context dependency:Activation relies on specific scenarios, for instance, doctors' diagnoses combining patient symptoms. Validation challenges: Subjective nature makes accuracy auditing harder than with documents.

AI-powered tacit knowledge management solutions are provided as follows:

a)Knowledge mining & externalization. For expert interviews, AI assistants like speech-to-text + DeepSeek-V3 summaries can extract key logic from recorded discussions.As for behavioral modeling, it can be externalized by analyzing operational logs as engineers' debugging steps with LSTM to identify patterns.

b)Contextual knowledge transfer. For AR guidance, overlay expert instructions via AR glasses, for example, repairing technicians viewing animated disassembly guides. As for case-based reasoning, convert historical cases like customer complaints into scenario libraries for AI-powered recommendations.

c)Community-driven knowledge sharing. About social network analysis, identify hidden knowledge hubs, for example, employees frequently consulted and incentive sharing. As for AI-curated FAQs, transform chat discussions like slack into structured knowledge. For expert mapping, build a searchable database of skills such as Python optimization or enterprise sales.

d)Simulation training & feedback. For virtual sandboxes, train novices in simulated environments like pilots practicing emergencies with AI feedback. About reinforcement learning, optimize decision paths as sales scripts by comparing AI-simulated actions to expert behavior.

e)Knowledge asset. For toolkit conversion, package expertise into reusable tools such as sales script generators or fault diagnosis trees. About IP protection, use blockchain to timestamp and certify critical processes.

5.3 Conversion Between Explicit and Tacit Knowledge

AI bridges the gap by following steps:

a)Externalizing tacit knowledge, for example, converting expert insights into case libraries.

b)Distributing explicit knowledge via management systems for organizational learning.

c)Internalizing explicit knowledge back into tacit understanding, fostering innovation"[10].

d)Expanding the knowledge base with new explicit knowledge, creating a self-reinforcing cycle of organizational intelligence,where collective experience is systematically reused, so as to reduce dependence on individuals.

6 Conclusion

The business knowledge management includes explicit knowledge management and tacit knowledge management. Neither the former nor the latter can separate from the knowledge retrieval, integration, classification, structure, storage, organization,

knowledge verification, share & security, transformation &innovation. Owing to the speedy evolution of the artificial intelligence technology and its use in the business knowledge management, the efficiency and effectiveness of all these stages like the knowledge retrieval and integration and so forth have been greatly rising. Only in the conditions of warmly embracing the artificial intelligence technology in the knowledge management can the enterprise make its competitive advantages more and more sharpening.

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