

Bridging Cultural and Linguistic Gaps with AI-Based Knowledge Management: A Solution for Language and Cultural Barriers at PT. STI

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ABSTRACT

In today's globalized economy, multinational corporations like PT. STI face significant challenges in enabling seamless knowledge sharing across culturally and linguistically diverse teams. This study proposes an Artificial Intelligence-based Knowledge Management (KM) system to address language and cultural barriers causing operational inefficiencies such as project delays and reduced productivity at PT. STI. Using a mixed-methods approach, the research applies the Asian Productivity Organization (APO) KM Framework to evaluate the company's KM maturity, the Analytical Hierarchy Process (AHP) to prioritize AI features, and the Technology Acceptance Model (TAM) to assess employee perceptions of the system's usefulness and ease of use. Quantitative data from APO KM and AHP surveys were complemented by qualitative insights from semi-structured interviews with key personnel. The APO KM assessment shows PT. STI at the "Expansion" KM maturity level with a score of 135.14, highlighting weaknesses in knowledge processes, technology, and outcomes. AHP analysis identifies Real-Time Translation (RT) as the top feature (44%), followed by Automated Tagging/Categorization (AT) and Contextual Q&A/Summarization (CQ). Employee interviews corroborate these findings, demonstrating strong willingness to adopt the system due to its potential to overcome cross-lingual communication barriers and improve knowledge accessibility. The proposed AI-based KM system provides PT. STI with a framework to reduce language barriers, minimize knowledge silos, and boost operational efficiency. It is expected to shorten project timelines, lower costs, and increase client satisfaction, offering valuable insights for multinational corporations facing similar challenges.

KEYWORDS

Knowledge Management, Artificial Intelligence, Cross-Cultural Communication, Language Barriers, Technology Acceptance Model (TAM)



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INTRODUCTION

Dalam ekonomi global yang saling terhubung saat ini, perusahaan multinasional seperti PT. STI menghadapi tantangan krusial dalam memfasilitasi berbagi pengetahuan (*knowledge sharing*) secara mulus antar tim yang tersebar di berbagai lokasi geografis. Manajemen pengetahuan yang efektif sangat penting untuk mempertahankan keunggulan bersaing, mendorong inovasi, dan memastikan konsistensi dalam pelayanan (Tenzer, Pudenko, & Zellmer-Bruhn, 2021). Namun, hambatan bahasa terbukti menjadi penghalang signifikan terhadap aliran pengetahuan, terlebih dalam perusahaan dengan operasi di wilayah yang sangat beragam secara linguistik, seperti Asia (Guillouët, Khandelwal, Macchiavello, Malhotra, & Teachout, 2021). Studi Peltokorpi dan Yamao (2017) menunjukkan bahwa kemampuan bahasa korporat karyawan di anak perusahaan (*host country nationals*) berdampak langsung terhadap *reverse knowledge transfer* jika dikombinasikan dengan frekuensi komunikasi dan visi

bersama. Penelitian ini menggarisbawahi pentingnya kesamaan visi dan komitmen sebagai mediasi dalam aliran pengetahuan antar unit, serta bagaimana frekuensi komunikasi memperkuat proses tersebut. Selanjutnya, literatur juga mencatat bahwa diskriminasi berbasis bahasa di organisasi multibahasa dapat melemahkan iklim kepercayaan internal dan menghambat kolaborasi efektif (Back, 2024).

Traditional KM practices often rely on documents, databases, and communication platforms that may not be accessible to all employees due to language differences. This can lead to knowledge silos, duplicated efforts, and missed opportunities for collaboration. As Al-Hawamdeh (2003) points out, "knowledge sharing is not simply about transferring data; it is about creating a common understanding and enabling individuals to learn from each other's experiences." This becomes particularly challenging when employees speak different languages and have varying levels of proficiency in a common language like English. (Nonaka, 1995) emphasize the importance of tacit knowledge sharing, which is often embedded in cultural and linguistic contexts, making it even harder to transfer across language barriers.

Artificial Intelligence (AI) offers a transformative solution to overcome language barriers and enhance knowledge management in multinational corporations like PT.STI. The potential of AI to dismantle such barriers, including linguistic and cultural ones, is increasingly recognized (Karakas, 2023). The complexities of managing knowledge are further amplified in multinational organizations, where strategic approaches are essential to bridge geographical and operational divides (Grant K. &, 2020). By utilizing natural language processing techniques, AI can help facilitate real-time translation of documents and communication, allowing employees to access and understand critical information regardless of their native language (Evans, 2021) AI can also analyze and summarize large volumes of multilingual data, extracting key insights and presenting them in a concise format, empowering employees to quickly grasp complex information (Evans, 2021) Additionally, AI-powered search engines can understand the meaning and context of queries in different languages, retrieving relevant information from various sources and enabling efficient knowledge discovery (Davenport, 1998). AI-mediated knowledge sharing has shown promise in elevating talent experiences within multinational enterprises, particularly in the IT sector (Malik, 2021). Integrating AI into Sunline KM system can create a more inclusive and collaborative work environment, leading to improved communication, increased efficiency, and accelerated innovation.

PT. STI is a major provider of financial technology (Fintech) solutions in Asia, specializing in banking technology and enterprise-level IT services. With a strong focus on innovation and a commitment to digital transformation, PT. STI has established itself as a trusted partner for financial institutions across the globe. PT.STI core business revolves around providing a comprehensive suite of financial technology solutions to empower financial institutions in their digital transformation journey.

Language and cultural barriers are significant challenges faced by multinational companies like PT STI, This cultural differences, often deeply ingrained and influencing communication styles and work ethics (Hofstede, 1980), further complicate particularly in its collaboration between the delivery team in Indonesia and the development and R&D teams in China. These barriers impede seamless communication and collaboration, creating significant knowledge management issues, such as knowledge silos, inefficiencies that affect project outcomes, cost management, and client satisfaction. Effectively managing these cultural differences is a key challenge for global leadership in contemporary organizations (Moran, 2014) Overcoming cultural barriers is a persistent challenge in fostering effective knowledge sharing within organizations (McDermott, 2001) and these language and cultural barriers often manifest as significant cross-cultural communication barriers within organizations (Nurbayani, 2023)

Some of the key symptoms affecting project delivery teams at *PT. STI* include project delays, particularly in collaborations between Indonesian and Chinese teams, which impact deadlines and overall timelines. These delays increase project costs due to rework, miscommunication, and the frequent need for translation during meetings and emails. Productivity decreases as inefficiencies lead to additional resource requirements. Quality inconsistencies arise because Indonesian teams must accurately capture client requirements and effectively communicate them to Chinese counterparts. Knowledge silos develop due to language barriers, causing duplicated efforts and redundant solutions. The root causes include the absence of AI-powered translation tools capable of handling technical terminology and real-time documentation, the lack of a centralized knowledge management system for multilingual collaboration, and variations in English proficiency combined with cultural differences that complicate communication and knowledge sharing.

This research is crucial for all stakeholders because it identifies these root causes and proposes solutions aimed at improving productivity, collaboration, and client satisfaction at *PT. STI*. Addressing language and cultural barriers, alongside knowledge management deficiencies, will facilitate smoother project delivery, reduce costs, and foster innovation. The proposed AI-powered knowledge management system, designed to support cross-lingual communication and knowledge sharing, will empower employees to collaborate more efficiently and contribute to the company's success.

Recent studies highlight the critical role of knowledge management and AI technologies in overcoming such challenges. Evans (2021) discusses AI's potential for real-time translation and multilingual data access, while Malik (2021) shows AI-driven systems enhancing talent experiences in multinational IT firms. Cultural barriers and their effects on knowledge sharing are examined by Nurbayani (2023) and McDermott (2001), with Haefner et al. (2021) providing frameworks for AI-supported knowledge tasks in diverse cultural contexts. The Technology Acceptance Model (TAM), developed by Davis (1989, 1992), continues to inform understanding of user acceptance of AI-based systems.

This study aims to analyze the critical challenges caused by deficient knowledge management within *PT. STI*, evaluate AI-based KM features to address these issues, understand employee perceptions of such systems, and develop a conceptual AI-based KM model tailored to improve multilingual collaboration and productivity.

METHOD

The author used a mixed-method research methodology, combining qualitative and quantitative methods to comprehensively analyze the research objectives: identifying cultural and linguistic barriers among employees, evaluating AI-based KM solutions, and understanding employee perceptions of KM implementations. The mixed-methods design was ideal, with the APO framework providing insight into *PT. STI*'s KM readiness level and the required AI features to enhance it. The AHP method helped prioritize which AI features to implement first. A semi-structured interview, guided by the TAM framework, was conducted with selected *PT. STI* employees to gauge their perceptions of the AI KM system.

The Asia Productivity Organization (APO) Knowledge Management Framework was integrated into the research to systematically assess and improve KM practices, aligning with the objective of leveraging AI to address linguistic and cultural barriers. The Analytic Hierarchy Process (AHP) prioritized AI-based KM tool features based on importance and impact. The Technology Acceptance Model (TAM) was also used to evaluate employee perceptions of these tools.

Data collection combined structured and semi-structured approaches to gather quantitative and qualitative insights. The APO framework evaluated *PT. STI*'s current KM

implementation and readiness, while the AHP applied pairwise comparison surveys to rank AI features such as Real-time Translation and Automated Knowledge Tagging/Categorization.

Qualitative data from semi-structured interviews, guided by TAM, explored employee perceptions of the AI KM system. Thematic analysis was used to identify, organize, and interpret recurring themes. The process included data familiarization through verbatim transcription, repeated reading, coding of data segments, and identification of broader themes. Examples of themes included "Enhanced Collaboration" under Perceived Usefulness (PU), "Training Challenges" under Perceived Ease of Use (PEOU), and "Willingness to Adopt" under Behavioral Intention (BI). Triangulation cross-referenced these themes with quantitative results from the TAM survey, APO, and AHP analyses to ensure validity. Findings were organized thematically under TAM constructs and visualized with thematic maps.

RESULTS AND DISCUSSION

APO KM Readiness Assessment Result Summary

To calculate the stage of KM Readiness level of PT STI we can add scores from all the categories.

Table 1. Results and Discussion - PT.STI's KM Results

KM Categories		Total of Average Scores
1	KM Leadership	19.71
2	Process	19.79
3	People	20.08
4	Technology	21.17
5	Knowledge Process	16.13
6	Learning & Innovation	19.96
7	KM Outcomes	18.3
Total		135.14

Source: Author (2025)

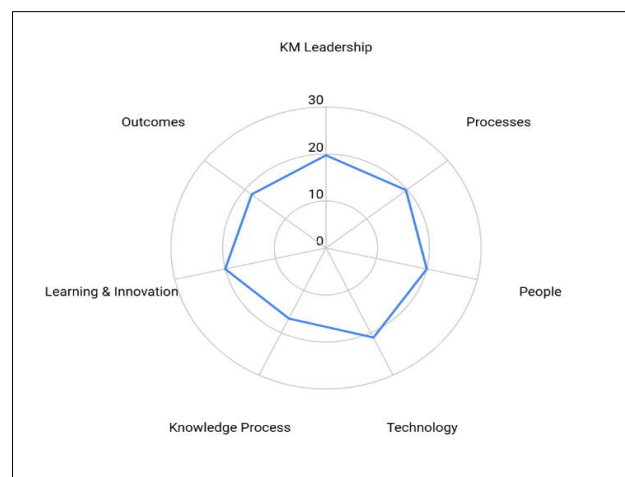


Figure 1. RESULTS AND DISCUSSION-I - PT.STI's KM Result Graph,
Source: Author (2025)

Based on the total score of 135, it can be concluded that PT.STI is on the KM Maturity level 3: Expansion (Institution-wide KM implementation), which is true as there are KM

Implementation already existed within the organization especially in China, though it cannot directly be used by Indonesian Team because of the language barriers.

APO KM Readiness Assessment OFI

Based on the OFI the identified AI Features necessary to address PT.STI challenges are:

1. **Real-time Translations (RT):** Instantly translate documents
2. **Automated Tagging / Categorization (AT):** Auto-organize documents with tags or categories for easier management
3. **Personalized Recommendations (PR):** Suggest relevant documents, experts, or content based on user roles or history
4. **Contextual Q&A / Summarization (CQ):** Ask questions and get answers or summaries directly from internal documents
5. **Knowledge Gap / Trend Analysis (KG):** Analyze user usage or searches to identify knowledge gaps or emerging trends.

Prioritization of AI features using AHP Method

Pairwise Comparison Matrix

After aggregating data using the geometric mean and calculation of the reciprocal values, the pairwise comparison matrix for the 5 AI KM features as follows:

Table 2. RESULTS AND DISCUSSION - PT.STI's Pairwise Comparison

	RT	AT	PR	CQ	KG
RT	1	3.32	3.74	3.20	2.95
AT	0.30	1	1.92	0.90	2.73
PR	0.27	0.52	1	0.49	1.62
CQ	0.31	1.11	2.02	1	1.37
KG	0.34	0.37	0.62	0.73	1

Source: Author (2025)

This matrix then will be normalize using the total sum of each column, and the normalized matrix as follows:

Table 3. RESULTS AND DISCUSSION - PT.STI's Normalize results

Normalize	RT	AT	PR	CQ	KG
RT	0.45	0.53	0.40	0.51	0.31
AT	0.14	0.16	0.21	0.14	0.28
PR	0.12	0.08	0.11	0.08	0.17
CQ	0.14	0.18	0.22	0.16	0.14
KG	0.15	0.06	0.07	0.12	0.10

Source: Author (2025)

Criteria Priority Weights

Based on the normalized matrix above, the priority weight for each AI KM feature then is calculated and are as follows:

Table 4. RESULTS AND DISCUSSION - PT.STI's Priority Weights

AI Feature	Weight	Percentage	Rank
RT	0.44	44%	1
AT	0.19	19%	2
PR	0.11	11%	4
CQ	0.17	17%	3

AI Feature	Weight	Percentage	Rank
KG	0.10	10%	5

Source: Author (2025)

The most important features according to the respondent is the real time translation feature, that is in line with the main business issue which is language barriers.

Consistency Check Results

The consistency calculation gives the following values:

- Eigen Value (Lamda) = 5.2
- Random Index (RI) = 1.12
- $n = 5$

$$\begin{aligned}\text{Consistency Index} &= (\lambda_{max} - n) / (n - 1) \\ &= (5.2 - 5) / 5 - 1 \\ &= 0.05\end{aligned}$$

$$\begin{aligned}\text{Consistency Ratio} &= CI / RI \\ &= 0.05 / 1.12 \\ &= 0.04\end{aligned}$$

Consistency Ratio of 0.04 is less than the acceptable threshold of 0.10, the pairwise comparison judgement is considered **consistent**

Interpretation of AHP Analysis Results

The Analytical Hierarchy Process (AHP) provide a clear prioritization of the 5 proposed AI Knowledge Management features based on the judgement from PT.STI. The consistency ratio check confirmed the reliability of these judgement ($CR \approx 0.04 < 0.10$)

The Result of prioritization shows that RT (Real Time Translation) are the highest priority feature with significant weight of 44%, this is strongly aligned with the core business problem identified in this research, a language barrier between Indonesian delivery teams with China-based development teams.

Following RT, Automated Tagging/Categorization (AT) (19%) and Contextual Q&A/Summarization (CQ) (17%) ranked second and third. The considerable weight for the AT reflects the need for a systematic way to organise large amounts of technical knowledge and projects, destroying knowledge silos by making information easier to find once translated. this directly addressing the weaknesses found within APO's "Knowledge Process" and directly addressing the problem of "doubled work". CQ priorities highlight the need for employees to quickly access specific answers and summaries of documents that may be large or complex from other teams or projects, thereby increasing efficiency, further reducing the negative impact of knowledge silos, and preventing duplication of effort by making existing solutions easier to find and understand

These three high priority AI features: RT, AT, and CQ will be the focus of the MVP phase 1 implementation.

Semi Structured Interview

Participant: Senior Developer & Technical Assistant "Mr.S"

This interview with Mr.S, a developer at PT.STI, provides valuable insight into the potential reception of an AI-Based KM system. The finding indicates a clear recognition of existing challenges related to cross-lingual communication and knowledge accessibility, which directly impact efficiency and lead to redundant work. From Mr.S perspective, the proposed system is perceived as highly useful, especially for its translation and knowledge retrieval

capabilities, for Mr.S the system is anticipated to be easy to learn and use lead to a strong intention for adoption in his daily work.

Participant: Country HRBP “Ms.D”

This interview with Ms.D, a country HRBP, emphasize the existing communication and knowledge access challenges stemming from language barriers and decentralized information. From her perspective, the proposed AI-KM system perceived as highly useful for streamlining access to the information (especially in her case, searching for company policies) and improving cross-lingual understanding. The system is anticipated to be easy to learn and use, leading to a strong intention for adoption in her daily work. However, she is rightly points out that the success of such system heavily depends on the continuous effort to maintain an accurate and comprehensive knowledge base, alongside managerial support to drive adoption.

Participant: Business Analyst “Mr.K”

The interview with Mr.K strongly highlights the daily frustration and inefficiencies caused by language barriers and disorganized, inaccessible documentation. He perceived the proposed AI-KM System, particularly its integrated translation and intelligent search capabilities within the existing ERP, as extremely useful and easy to adopt. He anticipates significant improvement in productivity, collaboration and a reduction in the need to reinvent the wheel.

Participant: Assistant Finance Manager “Mr.Fe”

The interview with Mr.Fe, an Assistant Finance Manager who is proficient in Mandarin, highlight that even for those who can bridge some language gaps personally, systemic issues with document accessibility and language barriers for the wider teams remain significant pain points. He perceives the proposed AI-KM system as very useful for improving document retrieval, aiding colleagues who face language barriers, and enhancing overall collaboration and productivity. He expects the system to be intuitive and easy to integrate into his daily workflow, especially given current familiarity with AI tool.

Participant: Indonesian Regional Manager “Mr.Fa”

From management perspective strongly validates the need for the AI-KM system, he sees it not just as a translation tool but also as a comprehensive solution to address critical communication inefficiencies, cultural misunderstanding, knowledge silos and to prevent business opportunities.

Triangulation of Findings

This section combining the findings from the various data collection methods employed, including the APO KM Readiness Assessment, the Analytical Hierarchy Process (AHP) for AI feature prioritization, and the semi-structured interviews guided by the Technology Acceptance Model (TAM). The purpose of this triangulation is to show the convergence of evidence, and to strengthening the validity of the research conclusions regarding the challenges at PT. STI and the viability of the proposed AI-Based KM solution.

Triangulation of Business Issue

The research identified significant business issues stemming from language barriers and inadequate KM practices. Multiple data points converge to confirm the severity and nature of these challenges, as summarized in table below.

Table 4. RESULTS AND DISCUSSION Business issue triangulation

Business Issue	APO KM Finding	AHP Feature Prioritization	Interview Insight
Language barriers	Implicitly highlighted by low scores in “Knowledge Process” and “Technology”	Real time translation ranked as the highest priority.	Consistent theme of language differences (Chinese team and Indonesian team) as primary operational hurdle.
Knowledge Management Deficiencies or Silos	“Knowledge Process” dimension is the lowest average.	Automatic Translation and Contextual Q&A/Summarization is prioritized indicate the need for better KM organization	Participant depict difficulty accessing documents., scattered information and missed opportunities due to lack shared knowledge

Source: Author (2025)

The quantitative results from APO assessment indicated PT.STI is in the “Expansion” level of KM Maturity with score of (135.14). The “Knowledge Process” dimension low average (16.13) highlight the systemic weaknesses. The AHP analysis further pinpoint the critical point which is “Real Time Translation (RT)” as the top priority (44%). The qualitative data gathered from interview strongly corroborates with these findings. Interviewee consistently cited language barriers and knowledge accessibility issues as major hurdles. This convergence shows a consistent problem of language barriers and KM inefficiencies as central problems.

Triangulation of KM System Solution and Feature Prioritization

The research proposed an AI-Based KM system, with triangulation of data supports the relevance and prioritization of its features, as shown in the table below:

Table 5. RESULTS AND DISCUSSION - AI feature triangulations

AI feature	AHP Prioritization	Interview	APO
Real Time Translation (RT)	1 st at 44%	Highly valued for speed, efficiency and improved in cross-lingual communication (S, K, Fa)	Addresses general KM ineffectiveness due to language barriers that impede the whole knowledge process
Automated Tagging / Categorization (AT)	2 nd at 19%	Seen as helpful for organizing vast amount of information, enabling easier search and facilitating reuse of existing knowledge (K, Fa)	Addresses OFI in knowledge process and support better technology utilization for KM
Contextual Q&A / Summarization (CQ)	3 rd at 17%	Perceived as beneficial for quick information retrieval, understanding complex documents, and getting direct answer, thus saving time and effort (S, D, K)	Addresses OFI in Knowledge process and Outcomes by enabling faster access to use KM

Source: Authors (2025)

These MVP features directly target the weaknesses identified in the APO assessment. OFI in Knowledge Process are addressed with AT and CQ, while RT is enhancing overall accessibility. OFI in Technology are addressed by the proposal of this AI KM System solutions. This strong alignment validates the proposed MVP (phase 1) as a effective solution

Triangulation of System Adoption Potential

The semi-structured interviews provide a strong indication of positive user adoption for the proposed AI-KM system, which is crucial for the success of the implementation plan. This assessment guided by Technology Acceptance Model (TAM) triangulates the qualitative user feedback with the proposed system design and implementation strategy, summarized with table below:

Table 6. RESULTS AND DISCUSSION V - Triangulation of System Adoption Potential,

TAM Construct	Interview	Implication for Adoption & Implementation
Perceived Usefulness (PU)	All interviewee found the system to be highly beneficial for addressing daily challenges, improving efficiency and enhancing collaboration (S, D, K, Fe, Fa)	Positive PU suggest the MVP features will be well received, reinforce the value of features selected for MVP phase 1
Perceived Ease of Use (PEOU)	Anticipated to be user-friendly and easy to learn (S, D, K, Fa) System mockups are perceived positively	Aligns with the assumption that users will need minimal training during MVP Phase 1, minimal resistance for adoption
Behavioral Intention (BI)	High willingness expressed by all participants (S, D, K, Fa)	Indicate that the implementation plan will find a receptive audience

Source: Author (2025)

The consistently positive feedback for PU, PEOU and BI from diverse stakeholders suggest a high likelihood of user's acceptance and successful adoption of the AI-KM system. They provide a strong support for the Implementation plan detailed in later sections. In conclusion, the triangulation of quantitative data from the APO KM assessment and AHP analysis with qualitative insights from the semi-structured interviews give confirmation of the core business problems at PT.STI. It also validates the appropriateness of the proposed AI Based KM solutions and its prioritized features, strongly suggesting that the Implementation plan focusing on delivering these features is well founded and has a high probability of successful adoption and positive impact.

AI-Based KM System Prototype and Implementation Plan

Details the conceptual prototype of the proposed AI-based KM system for PT.STI and to outlines its implementation plan. This prototype focuses on to deliver the Minimum Viable Product (MVP) that are prioritized before with AHP analysis, which is: RT (Real-time

Translation), AT (Automated Tagging / Categorization) and CQ (Contextual Q&A/Summarization), also designed to address the OFI identified from the APO KM Readiness Assessment. The aim is to present a well-designed, actionable and impactful solution for PT.STI challenges.

MVP System Designs.

The Minimum Viable Product (MVP) of the AI KM System is designed to deliver the most impactful features first, this priority is a direct result of the AHP analysis done before, which include Realtime Translation (44%), Automatic Tagging / Categorization (19%) and Contextual Q&A / Summarization (17%)

Real Time Translation (RT)

The Real time Translation (RT) feature stands as the paramount component of the proposed AI-based Knowledge Management system, directly confronting the core challenge of linguistic barriers within PT.STI, it's the top ranking in the AHP Analysis, with overwhelmingly priority weight of 44%, its perceived as very importance by the employee. This feature is fundamentally a bridge between language, facilitating seamless communication and knowledge access across diverse language group within the organization.

RT feature is designed to provide users with instantaneous translation capabilities for text-based content, its functionality include:

- Direct text translation, user can input or paste text directly into designated interface within the KM system for quick, on the fly translation between supported language.,
- Document translation, user with appropriate permission can upload documents into the system and RT will process these documents, providing the translated version.
- Content Translation, user can request translation for existing documents and knowledge assets within KM repository

The RT feature will use AI technology such as Natural Language Processing (NLP) that analyse structure, grammar and semantics of the source text and ensure accurate interpretation.

The implementation of RT feature is strategically important to PT.STI offering benefits directly my tackling the most significant operational bottleneck. Its primary and most impactful benefit is the direct mitigation of language barriers, allow every employee to understood what is the knowledge inside each document without misinterpretation, consequently it will lead to significant reduction of miscommunication and rework by enable a clearer understanding of requirements, specifications across language, thus minimizing project delays, costly rework and inconsistent quality, furthermore RT promotes collaboration and knowledge sharing by creating an environment where knowledge isn't confined by linguistic boundaries, breaking down silos and addressing weaknesses in the APO "knowledge process". This seamless translation capability also results in increased productivity and efficiency by minimizing time lost to manual translations.

Automatic Tagging / Categorization (AT)

The Automatic Tagging / Categorization (AT) feature is the foundation of the proposed AI-based KM system, this feature is designed to systematically organize the knowledge asset repository within PT.STI, this feature directly addresses critical challenges related to knowledge discoverability and the reduction of knowledge silos.

The AT feature will employed advanced Machine Learning (ML) and deep learning models to perform intelligent content analysis on documents and other knowledge assets uploaded automatically, the Ai will analyse its textual content, structure, and metadata to automatically recommend relevant tags, keywords and categories, of course admin will be able to adjust such recommendation if needed.

These categorizations include:

- Project Identifier: Specific project names or codes, PM Names, etc
- Client Information: Names of client, Industry, Country, Regions, etc
- Product / Service Lines: Product Type, Fork Code, Modification Type., etc
- Document Types: classification content such as “Technical Specification”, “UAT Document”, “User Manual”, “Project Report”. “Best Practice”, or “Lesson learned”

The implementation of the AT feature is important for PT STI, because firstly it increases knowledge retrieval, by creating a structured and consistently proper tagged knowledge base, this will significantly improve the ease and speed which employee can locate relevant information.

Secondly it will mitigate knowledge silos. This structured approach is fundamental to breaking down existing knowledge silos, particularly between Indonesian and Chinese team, by making the information more transparent and easily accessible from anywhere in the world with internet connection.

Furthermore, this feature is crucial for addressing “knowledge process” in the OFI analysis, especially in storing and sharing knowledge. AT directly addresses these by providing an automated mechanism to ensure knowledge is not just stored but organized for effective sharing and reuse.

Effective implementation will also lead to reduction “doubled work” by making the existing solutions, documentation and experience easier to find, this will help prevent “re-inventing the wheel” and reduced duplicated efforts

A well tagged and categorized knowledge base serves as foundation for other AI features. It is a requirement for the optimal functional of others AI capabilities within KM system.

Contextual Q&A / Summarization (CQ)

The Contextual Q&A / Summarization (CQ) features represent a significant step towards transforming how employees at PT.STI interact with and leverage organizational knowledge. Prioritized third in the AHP analysis with a weight of 17%, this AI-driven capability is designed to provide direct, concise answers and summaries from the company knowledge base.

The CQ feature will empower users to ask question in natural language (Indonesian, English or Chinese) just like conversing with colleague. Instead of reading through numerous documents, users can just ask specific queries and the AI will provide answer based on the document.

Technologically this will uses an integration of several AI techs, such as:

- Natural Language Processing (NLP), to understand the intent and nuances of the user queries
- Retrieval-Augmented (RAG), this is a critical component, when a query is made, the RAG system first will retrieve the most relevant information chunks from PT.STI internal knowledge base and then the retrieved information is fed to LLM (Large Language Model) and the LLM will generate a coherent, contextually appropriate answer of concise summary.

Key strength of this RAG approach is its ability to ground AI’s Responses in PT. STI actual knowledge base. This approach would significantly reduce the risk of inaccuracies or “hallucinations” sometimes happens with LLM. Furthermore, the CQ System will be designed to provide citations or direct links back to the source document to generate answer, so that users can easily verify the information or directly access the original content is needed.

The implementation of CQ will greatly increase the knowledge accessibility and understanding, complex technical document or extensive project reports can be distilled into easily digestible summaries, making critical information more accessible to a broader range of employee, the benefit is the reduction of misinformation and increased quality knowledge sharing. Using RAG technology ensures that the answer will always derive and based on PT.STI internal document and combine with CQ allow everyone would be able to understand the document well, and even if the reader doesn't understand they can ask question for more explanations.

This CQ feature directly aligns with identified business issue and OFI, such as reduced productivity and project delays caused by time-consuming information search, and since it's also provide instant answer to the question it will increase the pain point found in the OFI analysis related to application of knowledge.

Implementation Plan

This section outlines a proposed 6-month implementation plan for the MVP of the AI-Based Knowledge Management system at PT.STI, this plan is structured for phase 1, focusing on delivering the core functionality of Automatic Tagging/Categorization (AT), Real-Time Translation (RT) and Contextual Q&A/Summarization (CQ).

This implementation plan goal is to deploy a functional MVP within 6 months that addresses the primary challenges of language barriers and knowledge accessibility, gather users feedback and prepare for improvement from user feedback.

Assumption that author take for this implementation plan, includes:

1. Dedicated project team, compromising of: PM, Developer (Back-End and Front-End), AI specialists, QA, Business Analyst (BA) with representative from key stakeholder like R&D, PMO, and Delivery teams.
2. Full Management support and allocated budget
3. Each key stakeholder has availability of company documentation to populate the initial knowledge base
4. Access to necessary IT infrastructure and potential cloud services for AI model (LLM) integration

Implementation Schedule from Week 1 to Week 12

	Activities	PIC	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
1	Finalize project team roles and responsibilities	PM												
2	Secure necessary approval and resources	PM												
3	Workshop with stakeholder	BA, PM												
4	Finalize technical requirement for AT, RT and RQ	Dev, Infra												
5	System Architecture and Database Setup	Dev, Infra												
6	Define metadata, categorization for AT uses.	BA, User												
7	Setup development, testing and staging environments	Dev, Infra												
8	Implement protocol for data access, storage, API.	Infra												
9	Development Basic Functionality (upload, storage, etc)	Dev												
10	AI Model Integration	AI Dev												
11	UI UX for Basic Functionality	BA												
12	Integrate Automatic Tagging (AT) API to document viewer	AI, Dev												

Implementation Schedule from Week 13 to Week 25

	Activities	PIC	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25
13	UI UX for Automatic Tagging (AT)	BA													
14	QA for Automatic Tagging (AT)	QA													
15	Integrate Real-Time Translation (RT) API to document viewer	AI, Dev													
16	UI UX for Real-Time Translation (RT)	BA													
17	QA for Testing for Real-Time Translation (RT)	QA													
18	Integrate Contextual Summarization (CQ) API to document viewer	AI, Dev													
19	UI UX for Contextual Summarization (CQ)	BA													
20	QA for Contextual Summarization (CQ)	QA													
21	Populate KM system with documents	User													
22	UAT	PM, User													
23	Go Live	PM												Live	
24	Evaluation and feedback Gathering	PM													

Implementation KPI

These KPI are intended to be checked during and immediately after the 6-month MVP pilot phase to evaluate its initial success and guide decisions for further development.

Table 7. RESULTS AND DISCUSSION. - Implementation KPI.,

KPI Name	Description	Target	Measurement
Active User Rate	Percentage of users actively using the KM System (logging at least 3 times per week)	>70% of users	System logs
Feature Usage Frequency	Number of times each MVP features is used	Consistent usage is preferred	System logs
User Satisfaction Score	Overall user satisfaction with MVP, use Likert scale	Average score with >4.0	Survey
Perceived Usefulness (PU)	Extent to which users believe the system enhances their jobs, use Likert scale	>75% agree or strongly agree	Survey
Perceived Ease of Use (PEOU)	Extent to which users believe the system is easy to use, use Likert scale	>75% agree or strongly agree	Survey

KPI Name	Description	Target	Measurement
Net Promoter Score	Likelihood of users recommending this system to other colleagues, use Likert scale	>75% would like to recommend	Survey
RT feature PU	User rating of the accuract and helpfulness of translation quality	>70% good	In System survey after usage
AT feature PU	User rating of the accuracy of the suggested tags	>80% accepted as is	In System survey after usage & System logs
CQ feature PU	User rating of the accuracy of the information provided by the system	>65% good	In System survey after usage
Reduction in Language related miscommunication	Number of reported miscommunication incidents	Noticeable reduction.	User interview post implementation
Perceived Efficiency in Cross-Team task	User qualitative feedback	Positive Feedback	User interview post implementation
Reduction in Reinventing the Wheel	User qualitative feedback	Noticable reduction.	User interview post implementation
System Uptime	Percentage of time the System is available and operational	SLA >99%	System Logs
Avg Response time for AI features	Average time for RT (per page) and CQ (per query)	RT <10s CQ <10s	System Logs

These KPI should be formally reviewed at the end of the 6-month MVP period to gather feedback, and create a data-driven decision about the system's future development.

CONCLUSION

The study identified significant operational inefficiencies at PT. STI stemming from language and cultural barriers, which were effectively addressed by proposing an AI-based Knowledge Management system focused on Real-Time Translation, Automated Tagging/Categorization, and Contextual Q&A/Summarization features. These solutions were prioritized using the AHP process and validated through employee perceptions using the TAM framework, indicating a strong potential for enhancing cross-cultural communication, knowledge accessibility, and overall productivity. Future research could explore the long-term impacts of such AI-based KM systems on innovation and client satisfaction within multinational organizations, as well as the scalability of the proposed model to other industries and cultural contexts.

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