Eduvest – Journal of Universal Studies
Volume 6 Number 7, July, 2026
p- ISSN 2775-3735 - e-ISSN 2775-3727

Enhancing Knowledge Accessibility and Preservation

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Keywords
Knowledge Repository;
SECI;
Knowledge Taxonomy;
Knowledge Domain

ABSTRACT

In the era of digital transformation, effective knowledge management has become essential for organizations to maintain operational continuity, improve productivity, and preserve critical institutional knowledge. The IT Department of Bank ABC faces challenges related to fragmented knowledge storage, limited accessibility to technical information, and potential knowledge loss due to employee turnover. These conditions affect the efficiency of knowledge-sharing processes and employees' ability to retrieve relevant information when needed. This research aims to design a knowledge repository system that enhances knowledge accessibility and supports the preservation of organizational knowledge within the IT Department of Bank ABC. This study employed a qualitative approach through stakeholder interviews and literature reviews to identify knowledge management challenges, define knowledge requirements, and develop a repository design framework. The analysis was conducted using the SECI knowledge management model, knowledge taxonomy, and User-Centered Design (UCD) approach, supported by Unified Modeling Language (UML) modeling. The results indicate that the proposed repository design can organize operational and technical knowledge into structured domains while providing essential features, including document management, knowledge categorization, search functionality, role-based access control, approval workflows, and audit trails. The proposed system design contributes to improving knowledge accessibility, reducing knowledge silos, and strengthening organizational memory. In conclusion, the knowledge repository provides a strategic framework for Bank ABC's IT Department to manage, preserve, and utilize knowledge effectively. Future implementation and usability evaluations are recommended to measure its practical impact.

INTRODUCTION

In today's fast-paced, technology-driven environment, effective knowledge management is critical for organizational success. At Bank ABC's IT Department, fragmented knowledge storage, the absence of mechanisms for capturing institutional knowledge, and limited onboarding resources create operational inefficiencies. These challenges become more significant when experienced employees leave the organization, resulting in the loss of valuable knowledge. Previous research conducted by Xiahou (2025) highlights that without well-

designed and adaptable knowledge repositories, organizations may struggle to retain and share critical knowledge, leading to operational inefficiencies and gaps in decision-making.

Currently, Bank ABC's IT Department faces several challenges related to knowledge storage and management. The absence of a centralized repository increases the risk of knowledge loss within the department when experienced employees leave [4]. Furthermore, the lack of an accessible and structured knowledge repository makes it difficult for employees to locate relevant information and resources related to IT projects, resulting in delays and reduced operational efficiency. Previous research indicates that implementing a knowledge repository can strengthen organizational memory and improve overall performance within the IT Department of Bank ABC [3].

To address these challenges, this study aims to design a knowledge repository tailored to the needs of the IT Department at Bank ABC. The repository is designed to improve knowledge accessibility and preserve critical institutional knowledge (Jones et al., 2006). To achieve this objective, knowledge taxonomy is applied to categorize knowledge into operational and technical domains. UML diagrams, including use case and class diagrams, are developed to model the repository structure and functionality, ensuring that the proposed system effectively addresses the department's specific knowledge management requirements.

In the current era of digital transformation, knowledge has become one of the most valuable organizational assets that influences operational sustainability, innovation capability, and competitive advantage. Organizations increasingly rely on their ability to create, store, share, and reuse knowledge effectively to support decision-making and business continuity (Gupta et al., 2023). The rapid advancement of information technology has increased organizational process complexity, creating a greater need for structured knowledge management mechanisms. Without effective knowledge management practices, organizations may experience challenges such as knowledge fragmentation, duplicated efforts, inefficient problem-solving processes, and the loss of critical expertise when experienced employees leave. Therefore, knowledge repositories have emerged as a strategic solution to ensure that organizational knowledge can be preserved, accessed, and utilized effectively across different organizational units.

The importance of knowledge management has been increasingly recognized as organizations face challenges related to knowledge loss and information accessibility (Gupta et al., 2023). In knowledge-intensive sectors such as banking and information technology, these challenges become more critical because operational activities depend heavily on technical expertise, system documentation, regulatory requirements, and accumulated employee experience. The banking industry, in particular, requires effective knowledge management practices because technology infrastructure, cybersecurity requirements, digital services, and regulatory frameworks continue to evolve. Consequently, organizations need structured mechanisms that enable employees to access reliable knowledge resources efficiently and support sustainable organizational performance.

Within information technology departments, knowledge management has become increasingly important because IT operations involve complex systems, applications, infrastructure, and continuous technological changes. The absence of centralized knowledge management systems may create knowledge silos, where information is stored separately within individual teams or employees. This condition reduces collaboration effectiveness and

increases dependency on specific individuals who possess critical technical knowledge (Cross et al., 2008). The IT Department of Bank ABC faces similar challenges, as existing documentation is distributed across different divisions without a centralized repository (Briers & Chua, 2001). As a result, employees experience difficulties in retrieving relevant information related to IT projects, legacy systems, troubleshooting procedures, and operational processes. Furthermore, when experienced employees leave the organization, valuable tacit knowledge may be lost because it has not been systematically documented and transferred.

Previous studies have demonstrated that knowledge repositories can significantly improve organizational memory and knowledge-sharing capabilities (Lee et al., 2026). Nagayoshi and Nakamura (2021) found that computer-based knowledge repositories can strengthen organizational memory by enabling employees to store and retrieve valuable knowledge resources more effectively. Similarly, Fadhlan and Sensuse (2022) emphasized that knowledge repository design contributes to improving knowledge management process capabilities through structured knowledge storage and accessibility mechanisms. Research conducted by Thokal, Deore, and Rongate (2024) also highlighted that effective knowledge repositories require appropriate structures, categorization strategies, and accessibility features to prevent knowledge loss and improve organizational performance. These studies indicate that knowledge repositories provide substantial benefits for organizations facing challenges related to knowledge preservation and utilization.

Although previous research has explored knowledge repositories in various organizational contexts, several limitations remain. Many existing studies focus primarily on developing general knowledge management frameworks or repository systems without specifically addressing the unique requirements of IT departments within banking organizations. The banking environment has distinct characteristics, including strict regulatory requirements, complex technological infrastructure, high dependence on system reliability, and the need for secure information management. Furthermore, previous studies often emphasize explicit knowledge documentation but provide limited discussion regarding the integration of tacit knowledge generated from employee experiences, troubleshooting activities, and informal knowledge-sharing practices. Therefore, a more contextualized approach is required to design a knowledge repository that accommodates both explicit and tacit knowledge within an IT organizational environment (Zack, 1999).

The research gap identified from previous studies indicates the need to develop a knowledge repository design that integrates knowledge classification, user requirements, and knowledge management processes into a structured system architecture (Budayan et al., 2024). Existing knowledge management approaches do not fully address how IT departments can transform dispersed operational experiences and technical expertise into accessible organizational knowledge assets (Bratianu, 2019). In addition, limited research has examined the simultaneous application of knowledge taxonomy, the SECI knowledge management model (Kaur & Kaur, 2025), and User-Centered Design (UCD) approaches (Kurniawan & Hidayat, 2024) to support repository development. Addressing this gap is essential because effective knowledge repositories should not only function as storage platforms but also facilitate knowledge creation, sharing, validation, and reuse among employees (Farnese et al., 2019).

The urgency of this research is reinforced by organizations' increasing dependence on information technology services and digital infrastructure (Di Vaio et al., 2021). For Bank ABC's IT Department, maintaining operational continuity requires the availability of accurate and updated knowledge regarding systems, applications, incidents, changes, and technical procedures (Sumbal et al., 2018). Without a centralized repository, employees may spend excessive time searching for information, repeating previously developed solutions, or relying on informal communication channels (Nakash & Bouhnik, 2024). Such conditions may reduce productivity and increase operational risks, particularly when managing legacy systems or complex IT environments (Sumbal et al., 2018). Therefore, designing an appropriate knowledge repository represents an important organizational strategy for preserving institutional knowledge, improving employee productivity (Nakash & Bouhnik, 2021), and supporting sustainable knowledge transfer (Mohaghegh et al., 2024).

This research introduces novelty by proposing a knowledge repository design specifically tailored to the IT Department of Bank ABC through the integration of the SECI knowledge management model, knowledge taxonomy, and User-Centered Design (UCD) approach. Unlike conventional repository designs that primarily focus on document storage, this research considers the transformation process between tacit and explicit knowledge by incorporating mechanisms for documentation, validation, categorization, and knowledge utilization. The proposed design also applies Unified Modeling Language (UML) diagrams, including use case and class diagrams, to represent system requirements and repository architecture. Through this approach, the research provides a structured blueprint that aligns technological design with organizational knowledge management needs.

The primary objective of this research is to design a knowledge repository system that improves knowledge accessibility and preserves critical institutional knowledge within Bank ABC's IT Department. Specifically, this research aims to identify existing knowledge management challenges, define essential knowledge domains, develop a knowledge taxonomy structure, determine repository requirements, and design system models that support knowledge storage, retrieval, sharing, and validation. By achieving these objectives, the research seeks to provide a practical solution for overcoming knowledge silos and improving the effectiveness of knowledge management practices within the organization.

The contribution of this research is both theoretical and practical. From a theoretical perspective, this study enriches knowledge management research by demonstrating how the SECI model, knowledge taxonomy, and UCD approach can be integrated to design an organizational knowledge repository. From a practical perspective, the proposed repository design provides Bank ABC's IT Department with a structured framework for managing operational knowledge, technical documentation, and employee expertise. The implementation of such a repository is expected to improve onboarding processes, accelerate problem-solving activities, reduce dependency on individual employees, and strengthen organizational memory. Furthermore, this research may serve as a reference for other technology-driven organizations seeking to develop knowledge management systems that support long-term operational sustainability.

METHOD

This study employed a qualitative approach to collect and analyze data. The data were obtained through stakeholder interviews at Bank ABC and a literature review. The research began with identifying knowledge management problems within Bank ABC's IT Department, followed by a literature review to establish the theoretical foundation. Data were collected and analyzed through interviews and knowledge mapping. Based on the findings, the study developed a proposed knowledge management repository design, which was subsequently evaluated.

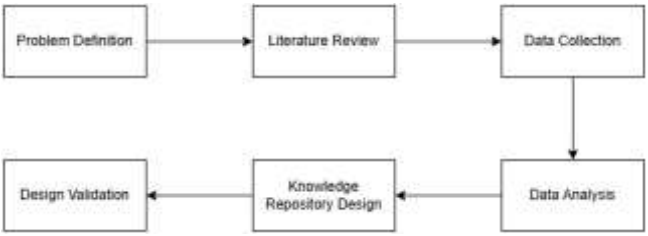

Figure 1 Research Flow

The process of designing and developing the knowledge repository will follow shelda debowski's approach of designing a core knowledge framework [7][8]. This process give a clear steps that need to be taken into consideration while developing a knowledge repository. This step use data gathered through interviews and analyze them based on the steps from the approach.

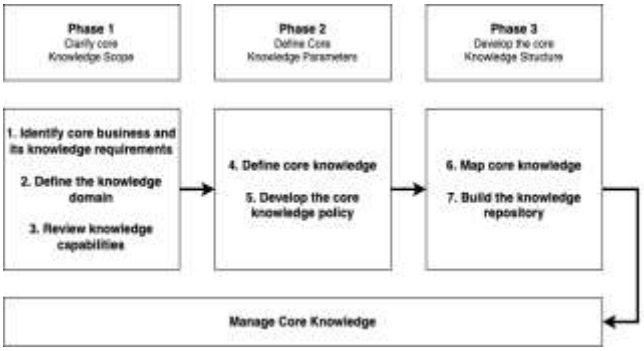

Figure 2 Phase of developing core knowledge framework

To help with defining knowledge needs and designing a repository, this paper also uses the SECI KM Model because it provides a structured framework for understanding how knowledge is created, shared, and utilized within an organization. Thus, a knowledge taxonomy can then be created based on the output of each steps on the framework. Knowledge taxonomy help this research in finding a structured way to organize, categorize, and retrieve relevant knowledge effectively within the repository.

Creating a knowledge taxonomy involves organizing knowledge into categories and subcategories to ensure easy access and retrieval. The process starts with identifying key knowledge domains, grouping related topics, and defining relationships between them.

Stakeholders validate the taxonomy to ensure it aligns with organizational needs before integrating it into the knowledge repository.

User-Centered Design (UCD) involves including users in the system development process to ensure it meets their needs and improves usability. UCD can be mapped to Unified Modeling Language (UML) tools such as use case diagrams to define system interactions and class diagrams to represent knowledge structures. This ensures a well-integrated system that aligns with both user requirements and organizational goals.

Data Analysis

Based on the previous section, this research will start with phase 1 of designing core knowledge which include identifying core business and its knowledge requirement, Defining knowledge domain and Review knowledge capabilities. The breakdown of each steps can be seen below.

1. Identify core business and its knowledge requirement

The IT Division at Bank ABC is responsible for delivering IT services that align with the bank's core business objectives while ensuring the support and maintenance of existing systems to enable seamless operations and innovation. Based on the interview conducted at Bank ABC, this research found that there are issues found in the IT Division.

1. **No Centralized Repository for Knowledge Storage**: While documentation exists within individual divisions of the IT department, the absence of a centralized repository leads to knowledge silos and loss, making it difficult to access and utilize effectively across the entire IT division.
2. **Knowledge Accessibility Challenges**: Due to the lack of a centralized repository, employees find it difficult to access relevant IT knowledge, leading to miscommunication and inefficiencies. Teams often work without proper context or prior knowledge, which negatively impacts the efficiency of project workflows. Employees of the IT Division in charge of legacy system or outdated system often had this problem.

2. Define the Core knowledge Domain

Based on the core business and knowledge requirement, this research use SECI KM model to help define knowledge domain within Bank ABC's IT Division. There are two domains based on the data gathered which is:

- **Operational Knowledge** (Explicit):
  This domain includes all knowledge related to incident, change, and release management. It facilitates problem tracking and information extraction for issues occurring within Bank ABC's IT systems.
    - **Explicit Knowledge**: This knowledge is documented in manuals, guidelines, and procedures that describe the processes for incident handling, change implementation, and release management.
- **Technical Knowledge** (Tacit and Explicit):
  This domain includes specialized technical knowledge necessary to guide IT staff on systems, applications, and infrastructure. It ensures that employees can efficiently manage and support Bank ABC's IT systems.

- **Tacit Knowledge**: Employees experience with IT systems, troubleshooting, and maintaining system integrity.
- **Explicit Knowledge**: This domain also includes formal documentation such as standard operating procedures (SOPs), system architectures, and configuration guidelines.

3. Review knowledge capabilities

At Bank ABC, there are some knowledge-sharing activities occurring among employees, particularly through informal discussions, team meetings, and training sessions. However, these efforts are not supported by a structured system, and the knowledge shared is often not documented or stored in a central repository. As a result, while employees exchange valuable insights and experiences, there is no formalized system to capture, organize, and store this knowledge. This leads to challenges in accessing important information when needed, and critical knowledge is at risk of being lost or fragmented. To address these issues, there is a need for a centralized knowledge repository that can systematically store and manage the knowledge shared across the organization.

4. Define Core Knowledge

Following the core business of Bank ABC, core knowledge present in the IT Division can be categorized as below:

1. Basic Core Knowledge:
   Encapsulates the basic essential knowledge employees at Bank ABC need to perform their roles effectively, this section include basic rules in the company.
2. Technical Knowledge:
   Encapsulates technical knowledge required for employees in the IT division, such as programming languages, system configurations, security protocols, and software tools necessary for day-to-day operations.
3. Compliance and Regulator Knowledge:
   Encapsulates the knowledge required to ensure that IT systems and processes at Bank ABC comply with industry regulations, legal standards, and internal policies.
4. Vendor and Third-party System Knowledge:
   Encapsulates knowledge regarding the management of external vendors and service providers, including contract management, vendor evaluation, and ensuring alignment with Bank ABC's IT needs.
5. Project Management Knowledge:
   Encapsulates the knowledge required to manage IT projects effectively, using methodologies like Agile, Scrum, and Waterfall to ensure projects are completed on time and within budget.
6. User Support and Troubleshooting Knowledge:
   Encapsulates the knowledge necessary to support end users, including troubleshooting IT system issues and providing solutions to common technical problems efficiently

5. Develop Core Knowledge Policy

Based on the core knowledge present, a policy is constructed to facilitate the management of knowledge between each member of the IT Division. The policy use the SECI model to facilitate the management, sharing, and utilization of both tacit and explicit knowledge within the proposed repository.

a. Socialization (Tacit-to-Tacit)
As stated in the previous section, The socialization quadrant focuses on the process of tacit knowledge transfer through direct interaction, collaboration, and shared experiences. And so, the knowledge policy needs to adhere to the needs of socialization. While repository cannot directly store Tacit knowledge, a recording or a notes and summaries needs to be able to be stored in the repository. These resources ensure that the essence of tacit knowledge is preserved and made accessible to other employees for reference and learning.

b. Externalization (Tacit-to-Explicit)
In externalization, tacit knowledge is converted into explicit format through documentation. To adhere to this segment, this policy stated what is mandatory for employees to document regarding critical insight, findings, lesson learned and important processes. To do this, a list of mandatories documentation is created including:

- **Incident Report**
  Every resolved IT incident must have a detailed incident report, including the problem, root cause, steps taken to resolve it, and preventative measures for the future.
- **Change Request**
  Every change in the system requested for the IT Division by other business division inside Bank ABC needs to be recorded. As this provide context for the future development of a system or a project.
- **Release Document**
  For every enhancement done to the system, a release document stating what is being done, the impact of said change to other system and so forth needs to be documented. This will provide a helpful insight when designing future collaboration project between two or more division in Bank ABC.
- **System Documentation**
  The IT Division at Bank ABC is divided into 12 squads each with their own system to handle. Therefore, system documentation is deemed mandatory to capture knowledge related to how the system operates, the anatomy and the architecture of the system and how does the system interact inside Bank ABC IT environment.
- **Knowledge-Sharing Session**
  This document records the findings and summary of each sharing session that is held by some members of Bank ABC. Because there are currently an established sharing session culture, the repository needs to safekeep that information as it contains many precious knowledge such as the how to of implementing new technologies, best practices and programming guide.

c. Combination (Explicit-to-Explicit)
The combination phase focuses on organizing, synthesizing, and integrating explicit knowledge from various sources to create new insights. This step ensures that knowledge within the repository is cohesive and structured for easy access and

application. To do that effectively, a policy is developed to ensure that each knowledge present in the repository can be combined seamlessly. This policy include:

- All documented knowledge in the repository needs to follow the regulated structure. The regulation will follow a standardized structure given by Bank ABC
- Each knowledge item needs to be labeled and tagged correctly based on their domain.
- Duplicate or outdated knowledge need to be reviewed again or archived.
- Each knowledge will need to be linked to relevant report or document to validate their content. An example would be an incident report linked to a valid issue ticket.

d. Internalization (Explicit-to-Tacit)

The internalization phase emphasizes the transformation of explicit knowledge from the repository into tacit knowledge through application, learning, and practice. To ensure this happen, relevant policy needs to be defined as:

- **The incorporation of knowledge repository content in onboarding and training process:**
  The training process for new employees or employees with new responsibilities need to include material taken from the repository to emphasize the role of this repository as the primary knowledge source.
- **Documentation of the defined critical knowledge:**
  Employees needs to document and upload the defined critical knowledge defined in the previous policy to contribute to the organizational knowledge in Bank ABC IT Division.
- **Regular scheduled validation on the repository content:**
  Conduct regular validation checks to ensure that repository content remains accurate, relevant, and up-to-date, with designated employees reviewing knowledge items on a scheduled basis.
- **Utilization of the repository:**
  Encourage the use of repository content as a foundation for analytical tasks, such as problem-solving, decision-making, and project planning, to ensure informed and efficient outcomes.

6. Map Core Knowledge

Based on the analysis conducted, this paper creates a knowledge taxonomy to map knowledge within the repository effectively. The taxonomy consists of four levels: Knowledge Repository, Knowledge Domain, Core Knowledge, and Knowledge Artifacts. This structure ensures that knowledge is systematically categorized, making it accessible and aligned with the organization's operational and strategic needs. The Taxonomy can be seen below.

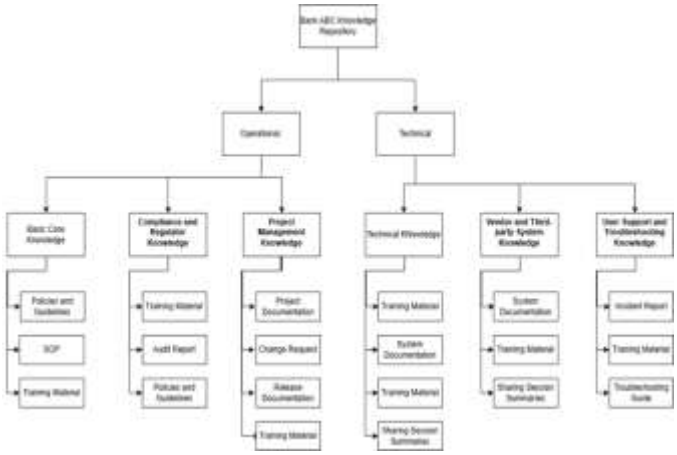

Figure 3 Proposed Knowledge Taxonomy

7. Build Knowledge Repository

Based on the analysis and the knowledge taxonomy, knowledge repository for Bank ABC can then be designed. The features and the modelling for the repository will be discussed in the next section.

RESULTS AND DISCUSSION

Features

Through data analysis process, we found that there are features needed to be present in the knowledge repository design. These requirements ensure that the knowledge repository functions as intended and is able to solve the problem faced by Bank ABC. These features can also be mapped into the SECI framework, highlighting how they support the creation, sharing, and utilization of both tacit and explicit knowledge within the organization. Below is the listed features needed to be present:

1. Socialization
    a. Review and Approval System: Facilitates collaborative interactions where tacit knowledge is shared among team members during discussions and evaluations, helping to refine and validate knowledge before it becomes explicit.
2. Externalization
    a. **Document Management:** Converts tacit knowledge into explicit documentation by organizing and storing insights, processes, and workflows into a structured format.
    b. **Review and Approval System:** Supports the documentation of tacit knowledge into explicit formats through feedback and formal approvals.
3. Combination
    a. **User Management:** Combines explicit knowledge about user roles and access into a centralized system for managing users effectively.
    b. **Role-Based Access Control:** Integrates explicit rules and permissions into structured policies for controlled access to the repository.
    c. **Knowledge Categorization:** Structures explicit knowledge into categorized domains to improve discoverability and usability.

d. **Audit Log:** Consolidates explicit records of user actions into an organized log for compliance and system monitoring.
e. **Reporting System:** Synthesizes explicit knowledge from various inputs to generate structured reports for tracking and analysis.

4. Internalization
    a. **Search Function:** Provides users with access to explicit knowledge, allowing them to internalize and apply it to their tasks and workflows.

Based on the criteria listed, this paper will use UML to represent the proposed KM Repository design. The repository will be represented using class and use case diagram.

UML Modelling

a. Use Case Diagram

The first step to translate the requirement for the proposed repository is to create a Use Case Diagram. This diagram shows what each actors needs to be able to do when using the system. Below is the representation of the proposed repository using a Use Case Diagram

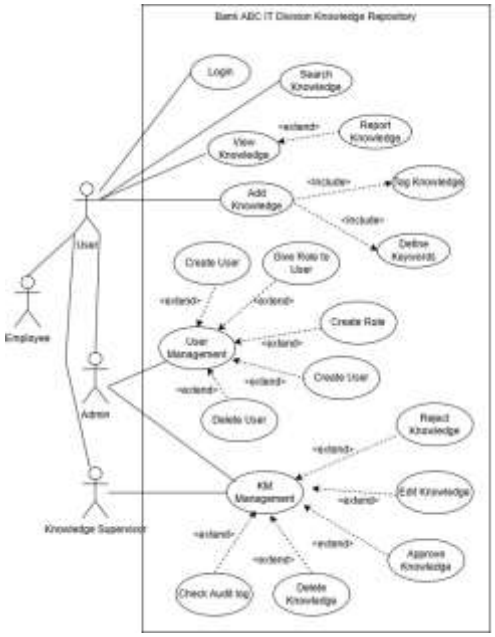

Figure 4 Use Case Diagram

1. User

- **Login**: Access the system.
- **Search Knowledge**: Look for specific knowledge resources.
- **View Knowledge**: Access and read knowledge content.
- **Add Knowledge**: Contribute new knowledge to the repository.
- **Report Knowledge**: Flag inaccurate or outdated knowledge.
- **Tag Knowledge**: Categorize knowledge for easier retrieval.

2. Employee

- Inherits all the use cases of a **User**.

- Limited to contributing, reporting, and accessing knowledge but does not have administrative or supervisory privileges.

3. Admin

- Inherits all the use cases of a **User**.
- Additional use cases:
    - **Create User**: Add new users to the system.
    - **Delete User**: Remove users from the system.
    - **Give Role to User**: Assign roles to users.
    - **Create Role**: Define new user roles.
    - **Delete Knowledge**: Remove outdated or irrelevant knowledge entries.
    - **Check Audit Log**: Monitor system activity for security and compliance regarding knowledge stored within the system.

4. Knowledge Supervisor

- Inherits all the use cases of a **User**.
- Additional use cases:
    - **Approve Knowledge**: Review and validate knowledge submissions before publishing.
    - **Reject Knowledge**: Decline knowledge submissions that do not meet the given criteria.

b. Class Diagram

The class diagram shows a more technical side of the requirements. Along with the connection each class have, this diagram shows what is inside of each class. The attribute (mark with "-" sign) is a variable or object present in that class while function (marked with "+" sign) is the method of which that class can do. Below is the proposed Class Diagram design.

Figure 5 Class Diagram

A thorough breakdown of the diagram can be seen below:

1. Knowledge Manager

This class handles all operations related to managing and interacting with knowledge content in the system. This serves as the controller that contains all logic used by user when interacting or managing the knowledge within the system.

- **Attributes:**
  - UserID: Unique identifier of the user performing knowledge-related actions.
  - KnowledgeID: Unique identifier of the knowledge entry being managed.
- **Methods:**
  - SearchByTitle(): Allows users to search for specific knowledge using its title.
  - AddKnowledge(): Enables users to upload and add new knowledge to the repository.
  - EditKnowledge(): Facilitates editing existing knowledge to keep it updated.
  - ViewKnowledge(): Provides access to view the details of specific knowledge entries.
  - RejectKnowledge(): Allows rejecting knowledge entries that do not meet system criteria.
  - ReportKnowledge(): Facilitates reporting inaccurate or irrelevant knowledge for review.

2. Audit

This class tracks and maintains a detailed history of user actions for auditing and compliance purposes in line with the policy at Bank ABC.

- **Attributes:**
  - AuditLogID: Unique identifier for a specific log entry in the audit system.
  - Log: Detailed description of the logged action.
  - DateTime: Timestamp indicating when the action occurred.
  - ActionLog: The type of action being logged, such as edits or deletions.
- **Methods:**
  - GenerateLog(): Automatically creates logs for actions performed in the system.
  - ViewLog(): Allows authorized users to review the logs for system activities.
  - DeleteLog(): Facilitates the removal of older or unnecessary logs from the system.
  - ExportLog(): Enables exporting audit logs for external analysis or reporting.

3. Attachment

This class manages attachments attributed to a knowledge

- **Attributes:**
  - AttachmentID: Unique identifier for an attached file.
  - KnowledgeID: ID of the knowledge entry to which the attachment belongs.
  - AttachmentName: Name or title of the attached file.
  - Size: The size of the attachment in bytes.
- **Methods:**
  - UploadFile(): Allows users to upload files to associate them with a knowledge entry.
  - CancelUpload(): Lets users cancel a file upload if needed.

4. Knowledge

This class defines the core structure of knowledge entries within the system. It also supports the base mechanism to core function such as adding or archiving knowledge

- **Attributes:**
  - KnowledgeID: Unique identifier for a knowledge entry.
  - KnowledgeDomainID: ID of the domain the knowledge belongs to.
  - AttachmentID: ID of any files attached to the knowledge entry.
  - TagID: Associated tags for categorizing the knowledge.
  - KeywordID: Keywords linked to the knowledge for searchability.
  - Other attributes include Title, Author, Summary, Comment, Status, and DateUploaded.
- **Methods:**
  - Archive(): Moves outdated knowledge to an archive for future reference.
  - AddSummary(): Allows users to add or update the summary of the knowledge entry.
  - DownloadKnowledge(): Enables users to download the content of a knowledge entry.
  - AddTitle(): Allows editing or adding titles to knowledge entries.

5. User

This class represents the basic user of the system and provides authentication and role management functionalities.

- **Attributes:**
  - ID: Unique identifier for the user in the system.
  - RoleID: Role assigned to the user (e.g., Admin, Employee, Supervisor).
  - UserDomainID: The domain or department the user is associated with.
  - LoginName: Username used for login.
  - LoginPassword: Password used for authentication.
- **Methods:**
  - Login(): Grants access to the system after verifying credentials.
  - Logout(): Ends the user's session in the system.
  - AddUser(): Enables admins to add new users to the system.
  - DeleteUser(): Allows admins to remove users from the system.

6. Role

This class manages role-based access control to ensure users have appropriate permissions.

- **Attributes:**
  - RoleID: Unique identifier for a role in the system.
  - RoleName: Name of the role (e.g., Admin, Employee, Knowledge Supervisor).
  - Permission: Permissions or privileges assigned to the role.
- **Methods:**
  - CreateRole(): Allows admins to define new roles in the system.
  - GiveRole(): Assigns a role to a specific user.

- DeleteRole(): Removes a role that is no longer needed.

7. KnowledgeDomain

This class helps is in charge of knowledges in the defined domain as a way to categorized the knowledge within the system

- **Attributes:**
  - KnowledgeDomainID: Unique identifier for a knowledge domain.
  - DomainName: The name of the domain (e.g., IT, HR, Marketing).
  - Description: A brief description of the domain.
- **Methods:**
  - GetAllKnowledgeInDomain(): Retrieves all knowledge entries associated with a specific domain.
  - AddDomain(): Allows admins to create a new domain for organizing knowledge.
  - DeleteDomain(): Removes a domain from the system.
  - SearchByDomain(): Enables users to search for knowledge entries within a specific domain.

8. Tag

This class supports tagging functionality for categoriizing knowledge within the system and searching mechanism.

- **Attributes:**
  - TagID: Unique identifier for a tag.
  - TagName: Name of the tag used for categorization.
  - TagDescription: Brief description of the tag's purpose.
- **Methods:**
  - AddToKnowledge(): Links a tag to a knowledge entry.
  - RemoveFromKnowledge(): Removes a tag from a knowledge entry.
  - SearchByTag(): Allows users to find knowledge entries using tags.
  - AddTag(): Creates a new tag.
  - RemoveTag(): Deletes an existing tag.

9. Keyword

This class support the feature of keywords that can be added into a knowledge within the system to support indexing and searching.

- **Attributes:**
  - KeywordID: Unique identifier for a keyword.
  - Keywords: List of keywords associated with knowledge entries.
- **Methods:**
  - AddToKnowledge(): Links a keyword to a knowledge entry.
  - RemoveFromKnowledge(): Removes a keyword from a knowledge entry.
  - SearchByKeyword(): Enables users to search knowledge using keywords.
  - AddKeyword(): Allows adding new keywords.
  - RemoveKeyword(): Facilitates the deletion of keywords.

10. Employee

This class represents general employees who interact with the knowledge system but have limited privileges.

- **Methods:**
  - ReplyFeedback(): Allows employees to respond to feedback received on knowledge entries.
  - CheckFeedback(): Enables employees to view feedback for improvement.

11. Admin

This class represents system administrators responsible for managing the overall system.

- **Methods:**
  - ManageSystemSetting(): Provides administrators with the ability to configure system settings.
  - CheckStorage(): Monitors and manages storage capacity for the repository.

12. Knowledge Supervisor

This class represents supervisors who oversee the knowledge contribution and validation process.

- **Methods:**
  - NotifyFeedback(): Sends notifications to users about feedback on their contributions.
  - CheckFeedback(): Reviews and manages feedback provided on knowledge entries.

13. Audio, Video, Document

These classes represent different types of multimedia or document attachments:

- **Audio:**
  - PlayAudio(): Plays audio files linked to knowledge entries.
  - ShowAnnotation(): Displays annotations related to the audio file.
  - DownloadAudio(): Enables downloading audio files.
- **Video:**
  - PlayVideo(): Plays video files associated with knowledge entries.
  - AnnotateVideo(): Allows annotations on videos for clarity or context.
  - DownloadVideo(): Downloads video files.
- **Document:**
  - OpenDocument(): Opens a document for viewing or editing.
  - DownloadDocumentOnly(): Allows downloading documents without changes.
  - OpenDocumentOnly(): Opens the document in read-only mode.

User Interface

From the results of the design above, the following is an example of the designed user interface (Figure 6 and 7). The interface in Figure 4.3 is designed to facilitate the addition of new knowledge into the repository with ease and efficiency. It simplifies the process by incorporating structured input fields and an intuitive layout, ensuring that users can add information without confusion.

Figure 6 Add New Knowledge Page

Figure 7 Knowledge Management Page

The Knowledge Management page is designed to provide an overview of all knowledge entries within the repository and their statuses. It allows users to monitor the progress and current state of each knowledge entry, including whether it is active, pending, or requires updates. The page displays essential details such as knowledge ID, title, creator, creation date, and status indicators for easy tracking. Users can also access detailed information about each entry, including associated incidents, changes, and comments.

Each page in the system is designed using the User-Centered Design (UCD) approach, ensuring that user needs and preferences are prioritized. Throughout the design process, users provided constructive feedback, which was incorporated into iterative improvements. This collaborative approach ensures that the interface is intuitive, functional, and aligned with user expectations, enhancing the overall usability and effectiveness of the system.

CONCLUSION

This research concludes that the design of a knowledge repository for the IT Department of Bank ABC provides a structured solution to address challenges related to knowledge accessibility, knowledge fragmentation, and institutional knowledge loss. Based on the analysis, the absence of a centralized knowledge repository created difficulties in retrieving critical technical and operational information, particularly when managing legacy systems and employee transitions. By applying the SECI knowledge management model, knowledge taxonomy, and User-Centered Design approach, this research identified essential knowledge domains, including operational and technical knowledge, and transformed them into a structured repository framework. The proposed repository design incorporated key features such as knowledge categorization, document management, search functionality, role-based access control, approval workflows, and audit trails to support effective knowledge creation, sharing, validation, and utilization. Furthermore, UML-based system modeling through use case and class diagrams provided a comprehensive representation of repository requirements and system architecture, enabling organizations to preserve critical knowledge assets and strengthen knowledge management capabilities within the IT environment.

For future research, further development is recommended through the implementation of the proposed knowledge repository as a functional prototype and usability evaluation involving actual users from the IT Department of Bank ABC. Future studies may also explore the integration of advanced technologies, such as artificial intelligence, semantic search, recommendation systems, and natural language processing, to improve knowledge discovery and retrieval efficiency. In addition, longitudinal research could be conducted to evaluate the repository's impact on employee productivity, onboarding effectiveness, knowledge-sharing behavior, and organizational performance over time. Future research may also examine knowledge governance strategies, including mechanisms for maintaining data accuracy, updating repository content, and encouraging continuous employee participation in knowledge-sharing activities. These developments would strengthen the role of knowledge repositories as strategic organizational assets that support digital transformation and sustainable knowledge management practices.

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