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# CAPSTONE PROJECT

# KNOWLEDGE MANAGEMENT SYSTEM

# Project Definition and Scope

## Introduction

The rapid evolution of Information and Communication Technology (ICT) has created both opportunities and challenges for modern organizations. Businesses increasingly rely on digital solutions for managing knowledge, collaboration, and decision-making. However, fragmented knowledge management systems and lack of structured project documentation often hinder employee productivity and organizational learning. This project proposes the development of a Knowledge Management System (KMS) that integrates Artificial Intelligence (AI)-driven document embedding, retrieval-augmented generation (RAG) based chatbots, automated project updates, and real-time dashboards. The system aims to address organizational knowledge gaps, enhance collaboration, and ensure seamless transition when employees leave or join with that the competitor of the company details through the scrapping and the blog posting through incident automatically.

## Problem Statement

In most organizations, critical project knowledge is stored across multiple disconnected platforms such as emails, chat applications, and cloud drives. This fragmentation makes it difficult for new employees to gain insights into ongoing projects and hinders collaboration between teams. Furthermore, when employees leave an organization, valuable knowledge and project context are lost, leading to inefficiencies, delays, and repetitive work. There is a pressing need for a centralized Knowledge Management System that securely stores, retrieves, and summarizes project information in real-time, leveraging modern AI techniques to improve accessibility and usability.

## Objectives

The project aims to achieve the following SMART objectives:

**1.** Develop a secure authentication and role-based access system for employees and HR within 3 months.

**2.** Implement an Llama hosted-powered chatbot capable of answering project-related queries with at least 85% accuracy within 4 months.

**3.** Create a file upload and embedding pipeline to index project documents in FAISS and enable semantic search within 3 months.

**4.** Design and deploy HR dashboards providing real-time insights on employee activity, feedback, and project updates within 2 months.

**5.** Conduct system-wide integration testing and deliver a fully functional prototype within 6 months.

## Relevance to ICT Domain

The proposed KMS directly addresses current challenges in the ICT domain by integrating artificial intelligence, data analytics, and secure cloud-based infrastructure. AI-powered retrieval-augmented generation RAG systems enable contextualized question answering, while embeddings in FAISS improve semantic search accuracy. The project aligns with ICT trends such as AI-driven business intelligence, secure enterprise applications, and scalable cloud solutions. By providing a centralized, intelligent knowledge hub, the system enhances efficiency, security, and user experience in the workplace.

# Feasibility Analysis

- ## Technical Feasibility

  The system will be developed using Python (Streamlit for the interface, FAISS for embeddings, PostgreSQL for structured data, and APIs for external integrations,Open Source Llama models). These technologies are open-source, scalable, and widely adopted in the ICT domain, ensuring long-term sustainability and compatibility.

- ## Economic Feasibility

  The project primarily relies on open-source frameworks, which minimizes licensing costs. Hosting on affordable cloud services such as AWS (estimated at $0–$150 per month for initial deployment) ensures cost-effectiveness. The overall cost of the prototype development is estimated at $500–$1000, making it feasible for academic and enterprise environments.

- ## Ethical Considerations

  The system will ensure compliance with data privacy regulations such as GDPR by securing user data through encryption and role-based access control. Employee consent will be obtained for all uploaded files, and sensitive data will not be shared outside the organization. Ethical AI practices will be followed to ensure fairness, transparency, and accountability.

## Market/User Needs Analysis

Organizations face increasing pressure to manage and preserve institutional knowledge. According to Deloitte's Digital Workplace report, 75% of organizations identify knowledge sharing as a key productivity enabler. Similarly, Gartner predicts that by 2026, organizations that implement AI-powered knowledge management solutions will experience a 40% improvement in employee efficiency. User feedback indicates strong demand for systems that provide seamless onboarding, real-time insights, and AI-driven document search. This project directly responds to these needs by offering a secure, intelligent, and cost-effective KMS.

## Literature Review

Existing literature emphasizes the role of AI in transforming knowledge management systems. Studies highlight the effectiveness of retrieval-augmented generation in improving enterprise search (Lewis et al., 2020). Research on organizational knowledge sharing indicates that centralized repositories significantly reduce inefficiencies (Nonaka, 1994). Furthermore, cloud-based architectures enable scalable and secure knowledge solutions (Armbrust et al., 2010). This project builds upon these findings, combining AI-powered search with user-friendly interfaces and robust security mechanisms.

## Conclusion

The proposed Knowledge Management System (KMS) addresses critical ICT challenges by centralizing project information, enabling AI-driven insights, and ensuring secure collaboration. Through its integration of modern ICT tools, the project enhances efficiency, reduces knowledge loss, and improves user experience. With strong technical, economic, and ethical feasibility, the system demonstrates significant potential for real-world application and future scalability.

## Contribution Statement

Tvisha focused on drafting the problem statement and stakeholder analysis, Harsh worked on defining SMART objectives and feasibility analysis. The final document was collaboratively reviewed and refined to ensure clarity, completeness, and alignment with project requirements.