Autonomous Research Chatbot with Daily Research Updates

PRESENTED BY: P Mohan Laxmi Srimnannarayana
Regd No: 2024074185
Course: M.Sc - Data Science - (B)

Guide: K. Vedavathi, Professor

OUTLINE

- Introduction
- Problem Statement
- Proposed Solution
- Objectives
- Use Case Model
- Software Requirements Specification (SRS)
- System Architecture
- ER Diagram
- Module Identification
- Workflow Diagram
- Conclusion

INTRODUCTION

- Rapid growth of research publications across multiple domains
- Research papers are often lengthy and complex to understand
- Users spend significant time searching and reading research materials
- Staying updated with newly published research requires continuous manual effort
- Need for an intelligent system to simplify research access and understanding

Drawback of current system

- Research papers are long, complex, and difficult to analyze quickly
- Users require clear and precise answers instead of full reports
- Manual searching for latest research papers is time-consuming
- Continuous monitoring of research updates is inefficient

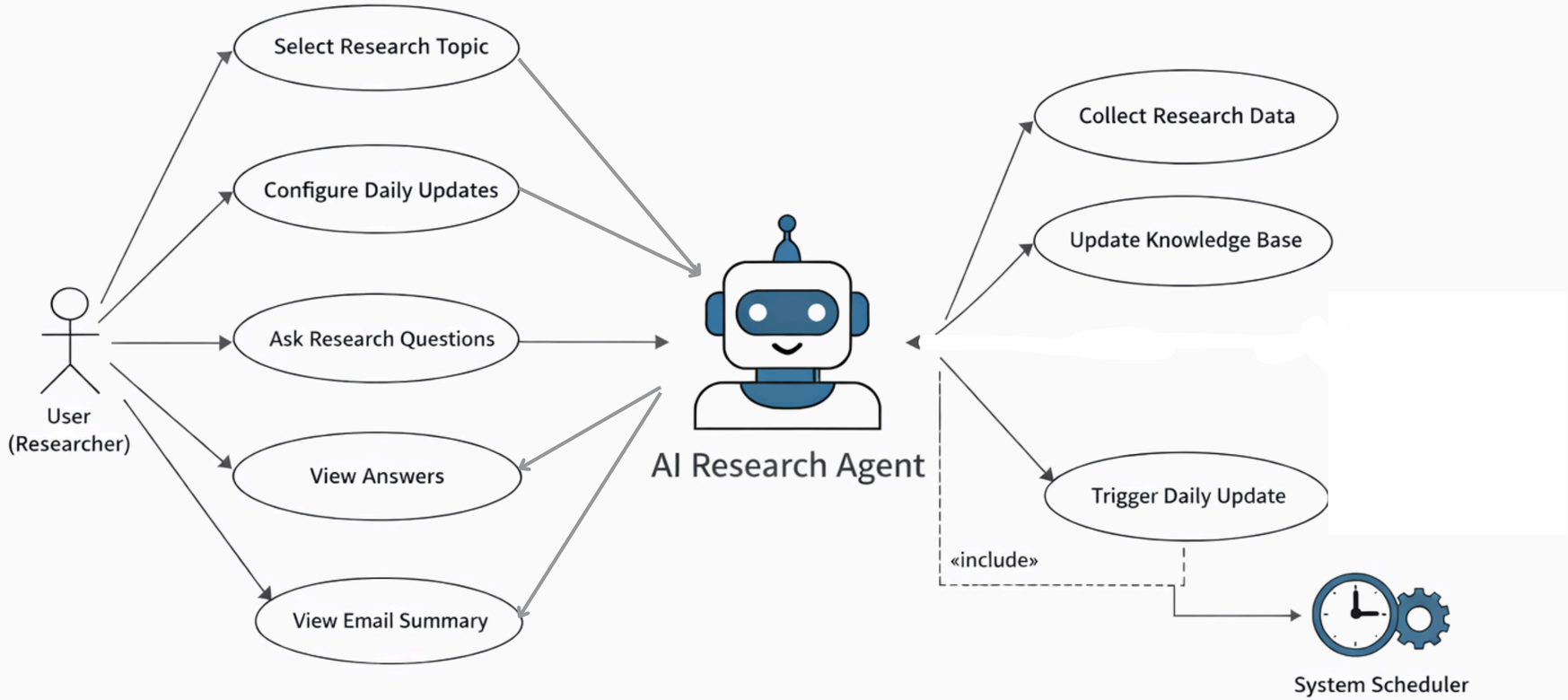
Proposed Solution

- An autonomous AI agent collects trusted research data
- Research content is cleaned and stored in a knowledge base
- Users ask questions via a chatbot
- Answers are generated strictly from collected research data
- Daily research updates are summarized and emailed automatically

OBJECTIVES

- To automate research data collection using an AI agent
- To provide accurate and fact-based answers to research questions
- To reduce the time required for literature review
- To enable users to stay updated with latest research articles automatically
- To design a scalable and reliable research assistance system

USE CASE DIAGRAM



USE CASE DESCRIPTION

- User selects a research topic to define the area of research interest.
- User configures daily research update preferences.
- AI Research Agent automatically collects trusted research data related to the selected topic.
- AI Research Agent processes and updates the collected research data in the knowledge base.
- User asks research-related questions through the chatbot interface.
- AI Research Agent retrieves relevant research information and generates accurate answers.
- System Scheduler triggers the daily research update process at the scheduled time.
- User views summarized research updates delivered via email.

SOFTWARE REQUIREMENTS SPECIFICATION (SRS)

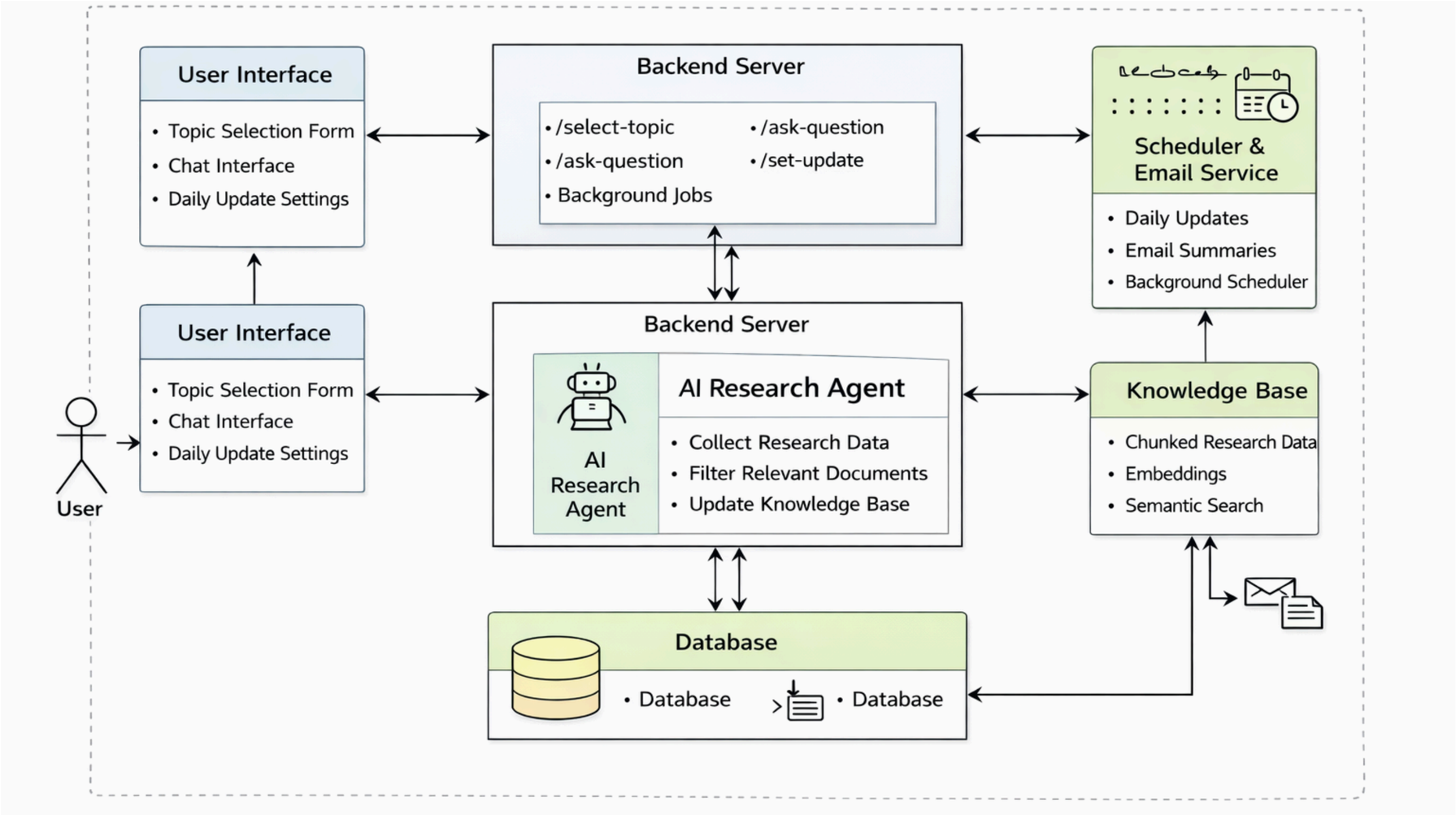
Functional Requirements

- The system shall allow users to select research topics
- The system shall collect research data automatically
- The system shall filter and clean collected research data
- The system shall store processed data in a knowledge base
- The system shall answer user queries based on stored data
- The system shall send daily research summaries via email

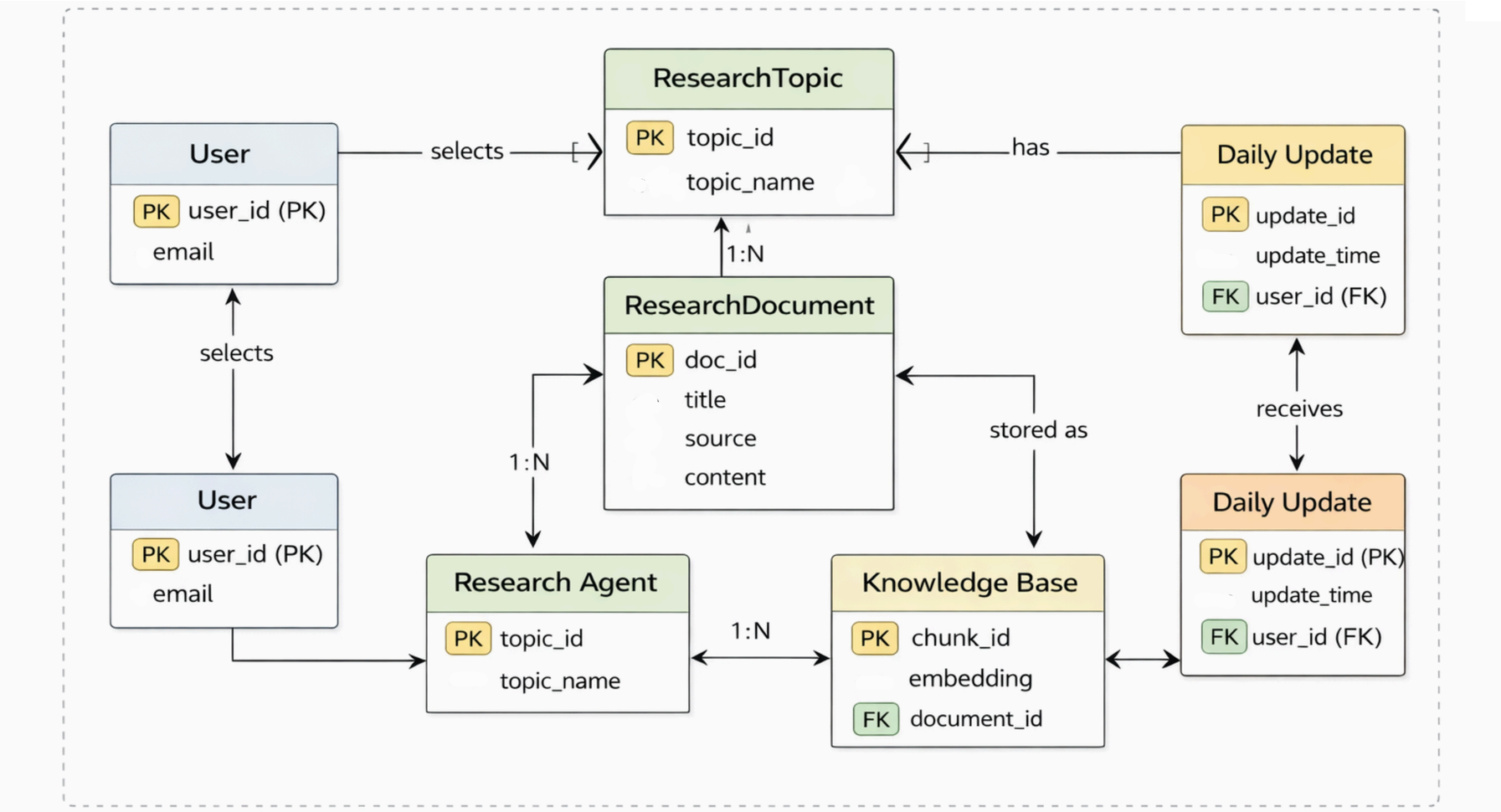
NON-FUNCTIONAL REQUIREMENTS

Accuracy: Answers should be fact-based
Performance: Fast query response time
Scalability: Support multiple users
Security: Protect user data and emails
Reliability: Ensure continuous availability
Usability: Simple and user-friendly interface

SYSTEM ARCHITECTURE



ER DIAGRAM


ResearchTopic
PK topic_id
topic_name
User
PK user_id (PK)
email
selects
has
Daily Update
PK update_id
update_time
FK user_id (FK)
1:N
ResearchDocument
PK doc_id
title
source
content
selects
1:N
stored as
receives
User
PK user_id (PK)
email
Research Agent
PK topic_id
topic_name
1:N
Knowledge Base
PK chunk_id
embedding
FK document_id
Daily Update
PK update_id (PK)
update_time
FK user_id (FK)

MODULE IDENTIFICATION

1. User Interface Module

- Topic selection
- Chatbot interaction
- Daily update settings

2. AI Research Agent Module

- Research data collection
- Workflow execution

3. Data Cleaning & Filtering Module

- Text preprocessing
- Relevance filtering

4. Knowledge Base Module

- Storage of processed research data
- Semantic retrieval

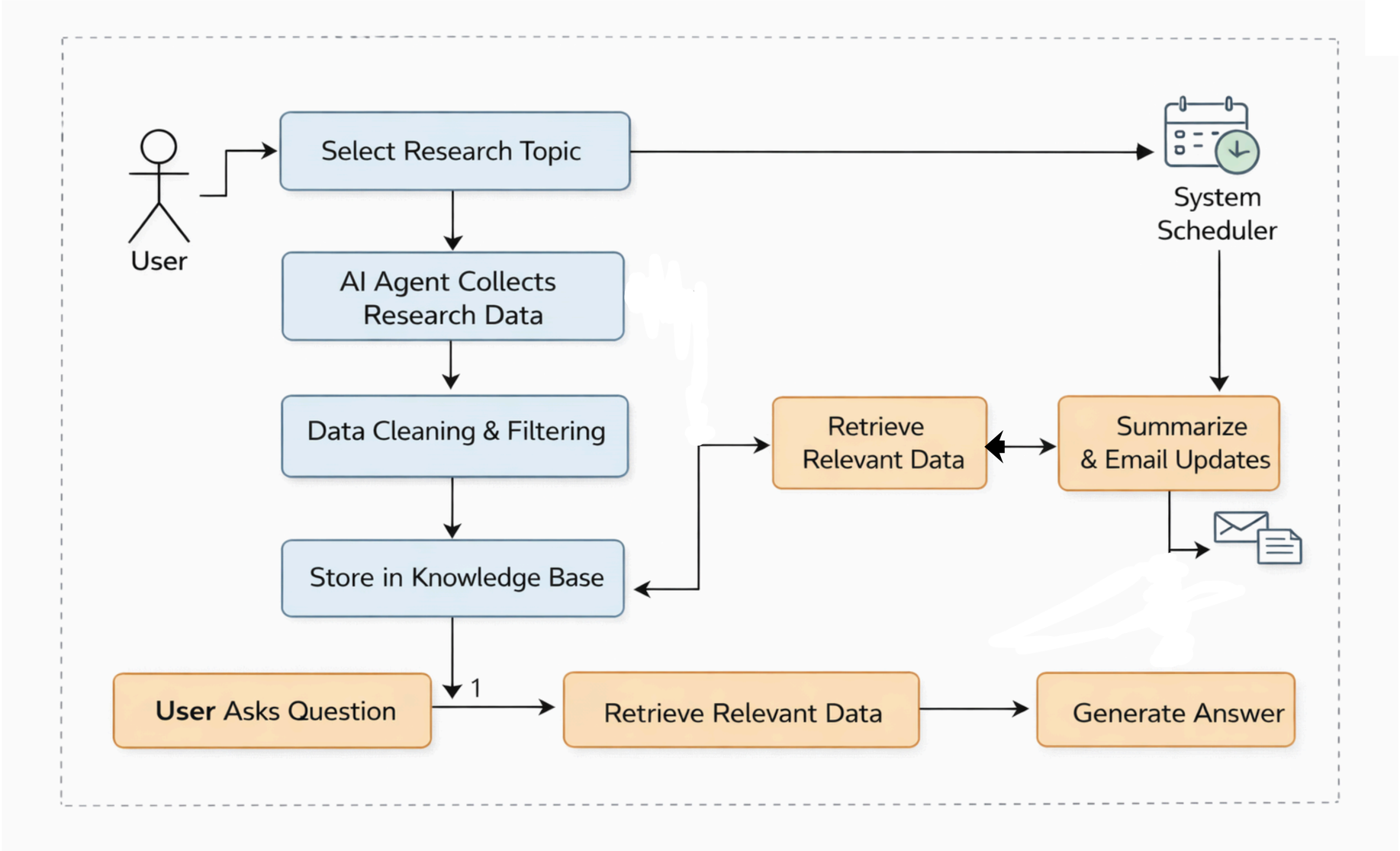
5. Question Answering Module

- Retrieve relevant data
- Generate responses

6. Scheduler & Email Module

- Daily scheduling
- Summary generation
- Email delivery

WORKFLOW DIAGRAM



CONCLUSION

- The system provides an automated solution for research assistance
- It reduces the time and effort required for manual literature review
- Ensures accurate and reliable answers based on curated research data
- Enables users to stay updated through automated daily research summaries
- Offers a scalable and user-friendly approach for academic and professional research

Thank You

Presented by: P Mohan Laxmi Srimananarayana
Guide: K. Vedavathi, Professor