



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SECJ3553-07 KEPINTARAN BUATAN (ARTIFICIAL
INTELLIGENCE)

PROJECT PROPOSAL

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INTRODUCTION

Artificial intelligence (AI) integration is becoming a more important factor in improving the whole student experience in today's dynamic educational environment. Our project proposal presents a novel idea: creating an AI chatbot for Kolej Tun Dr Ismail (KTDI) college facilities. The goal of this cutting-edge AI-powered chatbot is to completely transform the way that college staff and students engage with and obtain information about campus resources. Similar to how the example you gave concentrated on fruits, our project aims to use AI to improve and expedite how members of the college community interact with their campus.

PROBLEM BACKGROUND

In today's educational environment, college students often have plenty of questions and worries about the resources and services available on campus. These problems cover a broad range of difficulties, including finding one's way to different facilities, handling complaints and grievances about the state and operation of these facilities, and keeping track of the college office's opening hours. Furthermore, it is common for students to require access to information about different on-campus services, such as store hours, college cleaning schedules, and garbage collection timings. The escalation of these questions and the requirement for fast, reliable, and easily available information point to a major obstacle in making sure that students have a smooth and fulfilling college experience.

SIGNIFICANCE OF THE PROBLEM

This issue is extremely important since it has a profound effect on both the college community and the institution. Convenience, satisfaction, and academic success are fostered by having access to accurate information about campus facilities, student complaints, college office hours, and on-campus services. Additionally, it is significant from an institutional standpoint, impacting the college's standing, student retention, and administrative effectiveness. In addition, solving this issue can enable scholars and analysts to obtain important knowledge for improving higher education administration and service quality, which makes it crucial for both individual students and the larger domains of academic achievement and institutional success.

THE NEED FOR AN AI SOLUTION

The complex issues raised by questions and concerns from students about campus resources and services call for the use of a cutting-edge, effective solution. This is where artificial intelligence's (AI) potential comes in handy. We can create an intelligent chatbot that not only centralizes and arranges a multitude of complex data, but also guarantees its accessibility and user-friendliness by utilizing artificial intelligence (AI). With AI's ability to understand natural language and respond with context, the chatbot can become a reliable and useful tool for managing the various and ever-changing needs of the college community. It can also streamline procedures, improve the educational experience, and increase institutional efficiency.

Chapter 2: The Stakeholders and the Empathy Map

Stakeholders/Users of the Existing Application:

- 1. KTDI Residents:** Residents of KTDI are key stakeholders and users of the proposed AI chatbot, using it to expedite access to college information, file complaints and provide feedback. They seek a positive and efficient college experience as knowledge seekers, problem solvers, and time-conscious individuals. The AI chatbot, which is intended for quick information retrieval and community engagement, has the potential to have a significant impact on student satisfaction and institutional success.
- 2. KTDI Staffs:** Staff members at KTDI are major stakeholders and primary users of the envisioned AI chatbot, utilizing its features for expedited access to critical campus information, quick grievance resolution, and seamless feedback provision. They strive to improve operational efficiency inside the college as information custodians, solution providers, and time-conscious professionals. The AI chatbot, designed for quick information retrieval and staff involvement, has the potential to dramatically influence the performance of institutional operations, adding to overall happiness and success.

Empathy Map from the Stakeholders' Perspective:

KTDI Residents:

1. Says:

- KTDI residents often express that they struggle to find information about college facilities and services.
- They wish there was an easier way to report issues or complaints.
- Expressing feelings of being overwhelmed with academic commitments, they need quick solutions.

2. Thinks:

- KTDI residents want a seamless college experience without unnecessary hassles.
- Access to accurate information is crucial for their daily life on campus.
- They hope the AI chatbot can understand and respond to their specific needs.

3. Feels:

- Frustration due to difficulty in accessing timely information.
- Anxious about unresolved issues and grievances.
- Excitement about the potential of an AI solution to improve campus life.

4. Sees:

- KTDI residents observe a high volume of information channels and sources, leading to confusion.
- They witness the impact of delayed issue resolution on the overall campus experience.

5. Hears:

- KTDI residents hear about peers facing similar challenges in navigating campus resources.
- They hear about the potential benefits of technological solutions in improving daily life on campus.

KTDI Staff Members:

1. Says:

- KTDI staff members often mention that they receive numerous queries about facilities and services daily.
- Acknowledging that handling complaints and resolving issues can be time-consuming, they seek more efficient processes.
- They express the importance of efficient communication with students for a smooth operation.

2. Thinks:

- KTDI staff members consider that an AI chatbot could help in managing the volume of inquiries they receive.
- Streamlining complaint resolution can improve overall efficiency for them.
- They need a communication tool that understands and responds appropriately.

3. Feels:

- Overwhelmed by the constant influx of queries and complaints.
- Motivated to enhance the overall experience for students.
- Concerned about the potential challenges in adopting new technology.

4. Sees:

- KTDI staff members observe the impact of delayed issue resolution on student satisfaction and well-being.
- They witness the need for improved communication channels to streamline operations.

5. Hears:

- KTDI staff members hear about the challenges students face in accessing accurate information.
- They hear about the potential of AI solutions in improving communication and efficiency.

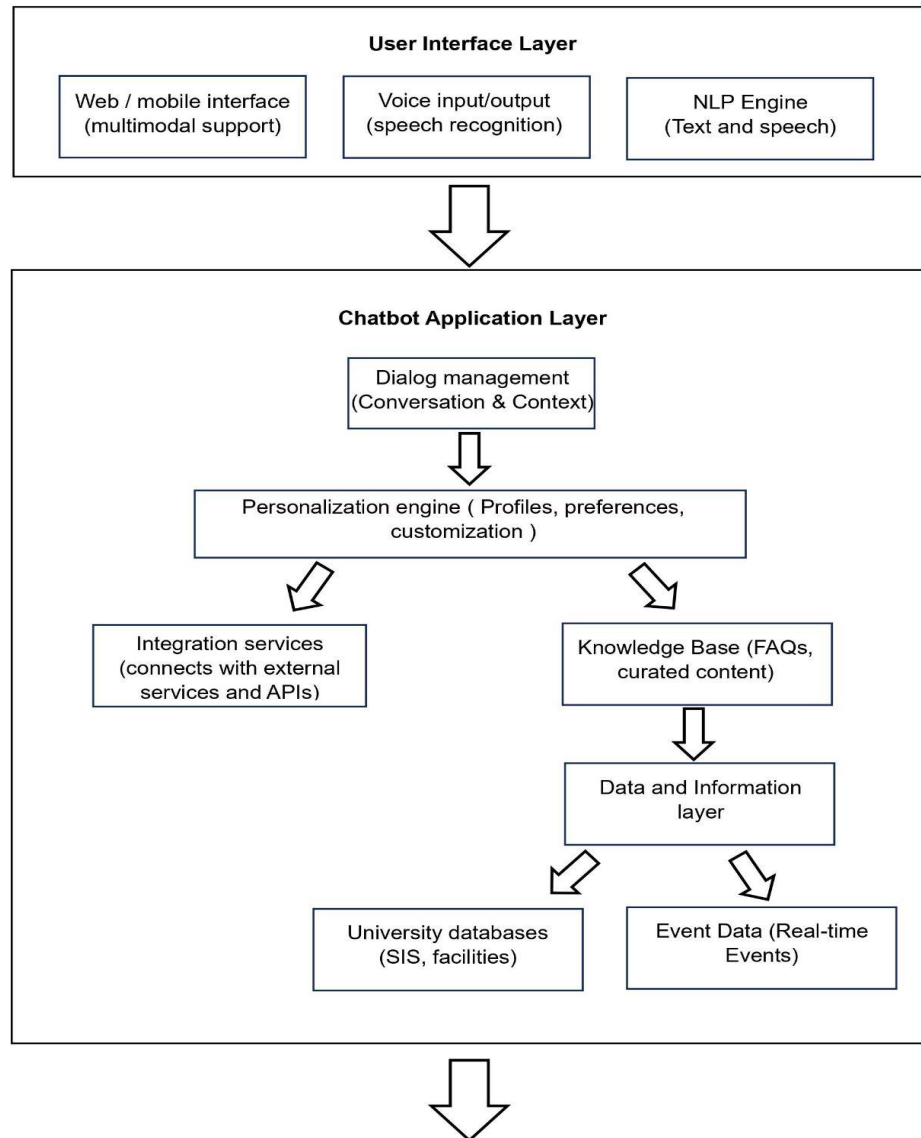
Chapter 3: System Architecture with Knowledge Base and Inference System

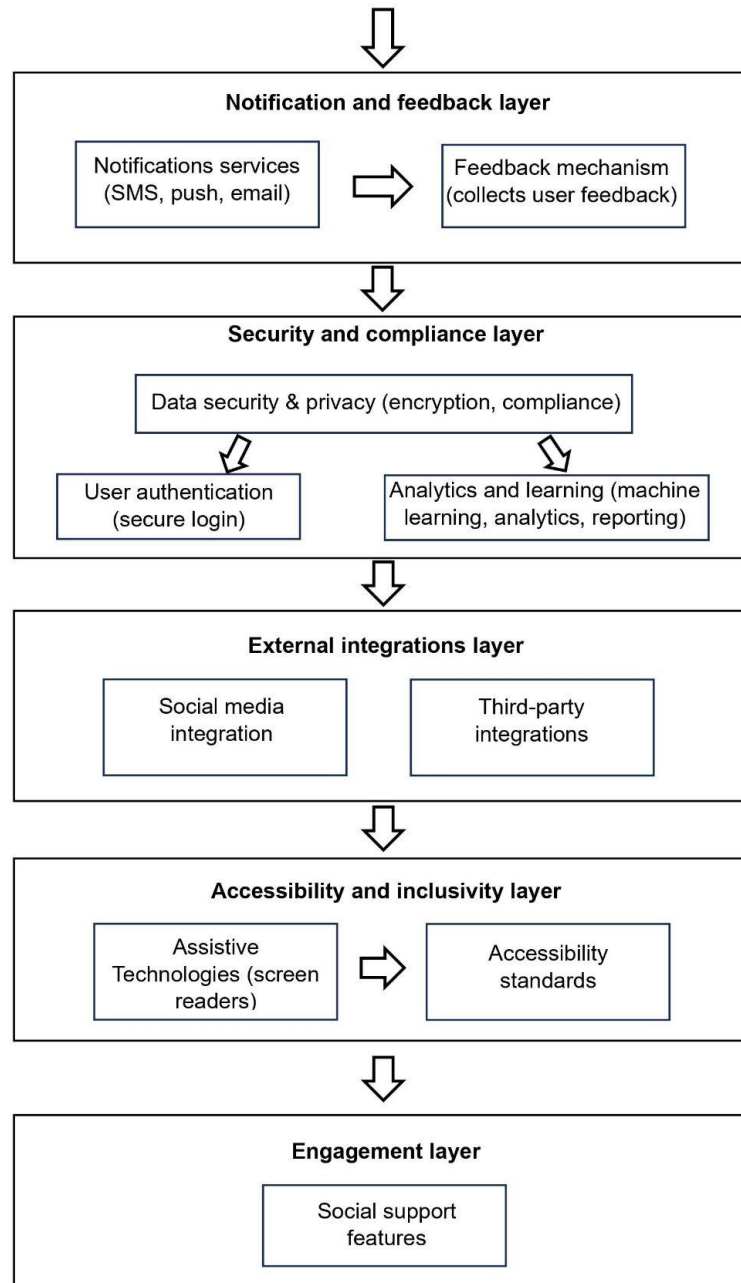
In Chapter 3, we delve into the intricate design of the proposed AI chatbot system for Kolej Tun Dr Ismail (KTDI). This section elucidates the foundational pillars of the system, focusing on the System Architecture, Knowledge Base, and Inference System. The chapter outlines the structural framework that supports the seamless integration of artificial intelligence to cater to the diverse needs of KTDI residents and staff members. By providing an in-depth exploration of the Knowledge Base, readers will gain insights into how the chatbot accesses, organizes, and comprehends information. Additionally, the Inference System, a critical component, will be elucidated to showcase its role in processing user queries and generating contextually relevant responses. This chapter serves as a pivotal guide to the technical underpinnings of the AI chatbot, paving the way for a comprehensive understanding of its functionality and potential impact on enhancing the KTDI college experience.

SYSTEM ARCHITECTURE OVERVIEW

The proposed system architecture is designed to consist of the following key components as illustrated in Figure 1.

FIGURE 1 : SYSTEM ARCHITECTURE DIAGRAM





COMPONENTS AND THEIR DESCRIPTION

Component	Description	Technology Recommendation
User Interface (UI)	Front-end component for user interaction, collects user input, and displays chatbot responses.	<ul style="list-style-type: none">- React (JavaScript library)- Vue.js (JavaScript library)
Inference System	Core component for processing user queries, drawing conclusions, and generating context-specific responses.	<ul style="list-style-type: none">- Python with open-source NLP libraries (e.g., TensorFlow, PyTorch)- Google Cloud AI
Knowledge Base	Core repository of information in our AI chatbot system for Kolej Tun Dr Ismail (KTDI). It efficiently organizes and stores data related to campus facilities, services, and procedures. This component empowers the chatbot to swiftly access accurate information, enhancing its ability to provide relevant and helpful responses to user queries. It is designed for adaptability, ensuring continuous updates to meet the evolving needs of the KTDI community.	<ul style="list-style-type: none">- Database management system (DBMS) (e.g., MySQL)- Version control system (e.g., Git)
Knowledge Base Update Mechanism	Ensures continuous refinement and relevance. Through automated and manual processes, new data is seamlessly integrated, reflecting changes in college resources, services, and policies. Regular evaluations and feedback loops contribute to accuracy, aligning the system with the evolving needs of Kolej Tun Dr Ismail (KTDI).	<ul style="list-style-type: none">- Python scripts for data scraping and updating- Node.js scripts for data scraping and updating- Version control system (e.g., Git)
API Layer (Optional)	Facilitates external communication for data enrichment and integration	<ul style="list-style-type: none">- Node.js with Express for building RESTful APIs

	with external resources.	
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SYSTEM WORKFLOW

1. Through the user interface, users or specifically students can interact with the chatbot by asking questions or requesting information about the facilities offered by the college.
2. The query is sent to the interface system by the user interface.
3. After processing the query, the inference system applies inference rules and pulls pertinent information from the Knowledge Base.
4. Context-specific responses are generated by the inference system based on the extracted data and inference results.
5. The user interface displays the responses to the user.

BENEFITS OF THE SYSTEM

- **Accuracy** : The KTDI AI chatbot obtains accurate and current information about college facilities from a Knowledge Base. This guarantees that faculty and staff have access to trustworthy information, improving their ability to make decisions and navigate the campus.
- **Contextual Understanding** : The chatbot's inference system allows it to understand the context of user inquiries. This implies that it can respond in a way that is appropriate for the given context, meeting the specific requirements of people looking for information about various campus facilities.
- **Customization** : Because of the chatbot's flexible inference system, rules and algorithms can be customized to meet the needs of individual users. This feature of customization guarantees that the chatbot can accommodate the different interests and information requirements of staff, faculty, and students.
- **Continuous Learning** : The chatbot is kept up to date with the most recent advancements in college facilities and services thanks to the Knowledge Base update mechanism. The ability to learn continuously is essential for informing users of any updates or changes to the campus environment.

By integrating a Knowledge Base and an Inference System, the KTDI AI chatbot is well-equipped to offer precise, context-aware information about college facilities. This benefits the college community by simplifying campus navigation, addressing specific queries, and ensuring users have access to the most up-to-date information, ultimately enhancing the overall college experience.