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Report On
“University Enquiry Chatbot”

Bachelor of Engineering in Artificial Intelligence & Machine Learning

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2025-26

Introduction:

This report details the design and implementation of the initial Minimum Viable Product (MVP) phase for the Smart Enquiry Chatbot, UniBot, tailored for XYZ College. The primary goal of this project is to leverage advanced generative AI (Google's Gemini API) to automate real-time responses to frequently asked questions (FAQs), thereby significantly reducing the administrative workload and improving service delivery for students, parents, and visitors.

The MVP establishes a foundational, focused, and reliable conversational bridge for institutional information, operating strictly within defined subject areas (admissions, fees, courses, placements, events, sports, and hostel/general queries).

Project Description:

Current Operational Inefficiencies

Currently, the university's enquiry process relies heavily on manual intervention, leading to substantial strain on administrative resources and degraded user experience:

1. High Volume & Repetition: Administrative staff spend a disproportionate amount of time handling repetitive questions via phone calls and emails (e.g., "What is the fee for the B.Tech program?" or "When is the next open house?"). This creates a heavy, cyclical workload that prevents staff from focusing on complex or strategic tasks.
2. Delayed Response Times: Manual processing inherently introduces delays, especially during peak periods like admissions cycles. Users often face long hold times or wait days for an email response, leading to frustration and potential loss of prospective students.
3. Inconsistent Information: Without a single, automated source, the consistency of information provided across different staff members can vary, leading to conflicting answers and official communication errors.

The current system is not scalable and poses a critical bottleneck to the university's growth and modernization objectives.

Solution Implementation and MVP Design:

The Smart Enquiry Chatbot MVP was designed using a minimal, high-efficiency architecture to achieve reliability, speed, and consistency immediately.

3.1 Core Technology and Grounding

- Generative Model: The system utilizes the gemini-2.5-flash-preview-09-2025 model for its speed, conversational capability, and robustness.
- Google Search Grounding: To ensure factual accuracy and access to real-time, up-to-date data (simulating access to a public university website), the Gemini API is configured to use Google Search Grounding. This prevents the bot from hallucinating or providing outdated information, making the generated responses more trustworthy.

3.2 Consistency and Scoping

To address the need for a focused "institutional bridge," the chatbot incorporates a strict set of rules defined in the System Instruction payload:

- Defined Persona: The bot adopts the persona of "UniBot" for XYZ College and explicitly states it is a test instance. Default, consistent facts are hard-coded into the system instructions (e.g., College Name, Address, Contact Email) to ensure internal consistency when answering location or contact queries.
- Knowledge Scoping: The bot is strictly restricted to answering questions only within the designated seven institutional categories: *Admissions, Fee Structure, Placement Details, Course Information, Event Updates, Sports, and Hostel/General*.
- Off-Topic Handling: If a user asks a question outside this scope (e.g., general knowledge), the bot is programmed to politely decline and redirect the user back to university-specific topics.

3.3 Human Escalation Mechanism

A key requirement was the ability to handle complex or urgent queries that require human expertise. This is managed via:

- Keyword Triggering: The front-end application monitors user input for escalation keywords ("human," "admin," "urgent").
- Visual Notice: Upon detecting an escalation keyword, a visible Escalation Suggestion notice appears in the chat interface.
- Consistent Contact Point: The notice immediately directs the user to a consistent institutional email (contact@xyzcollege.edu), providing a clear and reliable path to human support without relying on the AI to generate sensitive contact details.

Source code:

```
<script>
  // Configuration and Constants
  const MODEL_NAME = 'gemini-2.5-flash-preview-09-2025';
  const API_KEY = "";
  const API_URL = `https://generativelanguage.googleapis.com/v1beta/models/${MODEL_NAME}:generateContent?key=${API_KEY}`;
  const chatHistoryDiv = document.getElementById('chatHistory');
  const userInput = document.getElementById('userInput');
  const sendButton = document.getElementById('sendButton');
  const loadingIndicator = document.getElementById('loadingIndicator');
  const escalationNotice = document.getElementById('escalationNotice');

  // Chat history to maintain context
  let chatHistory = [];

  // System instruction to define the chatbot's role (Updated for XYZ College personality and default facts)
  const systemInstruction = "You are UniBot, the helpful and professional Smart Enquiry Assistant for XYZ College. Your persona is that of a reliable institutional bridge: friendly,"
```

```
function addMessageToUI(text, sender) {
  const messageWrapper = document.createElement('div');
  messageWrapper.className = `flex ${sender === 'user' ? 'justify-end' : 'justify-start'}`;

  const messageBubble = document.createElement('div');
  messageBubble.className = `${sender === 'user' ? 'user-message' : 'bot-message'} p-3 max-w-`;

  if (sender === 'bot') {
    const senderLabel = document.createElement('p');
    senderLabel.className = 'font-semibold text-indigo-700';
    senderLabel.textContent = 'UniBot';
    messageBubble.appendChild(senderLabel);

    // Add sources if available (simulated for MVP)
    const sourceText = document.createElement('div');
    sourceText.innerHTML = text;
    messageBubble.appendChild(sourceText);
  } else {
    messageBubble.textContent = text;
  }

  messageWrapper.appendChild(messageBubble);
  chatHistoryDiv.appendChild(messageWrapper);

  // Animate message
  setTimeout(() => {
    messageBubble.classList.remove('translate-y-2', 'opacity-0');
  }, 10);

  // Scroll to bottom
  chatHistoryDiv.scrollTop = chatHistoryDiv.scrollHeight;
}
```

```
function sendMessage() {
  const query = userInput.value.trim();
  if (!query) return;

  // 1. Display user message
  addMessageToUI(query, 'user');

  // 2. Add to chat history
  chatHistory.push({ role: 'user', text: query });

  // 3. Clear input and disable controls
  userInput.value = '';
  sendButton.disabled = true;
  userInput.disabled = true;
  loadingIndicator.classList.remove('hidden');

  // 4. Show/Hide escalation notice based on query
  if (needsEscalationCue(query)) {
    escalationNotice.classList.remove('hidden');
  } else {
    escalationNotice.classList.add('hidden');
  }

  // 5. Call the API
  callGeminiAPI(query);
}

// Event listeners for sending message
window.onload = () => {
  userInput.addEventListener('keypress', (e) => {
    if (e.key === 'Enter') {
      sendMessage();
    }
  });
  userInput.focus();
};
```

Screenshots:

 Smart Enquiry Assistant

UniBot
Welcome! I am UniBot, the Smart Enquiry Assistant for **XYZ College**. Please note I am currently running as a test instance. I can assist you with queries on admissions, fees, courses, placements, events, sports, and hostel details. How can I help you today?

How much is the annual btech fees?

UniBot
Hello! I am UniBot, the Smart Enquiry Assistant for XYZ College. I would be happy to help you with information on the B.Tech fee structure.

The annual B.Tech fees at XYZ College for the first year are ₹1,16,256.

Please note that this amount may be subject to change and could have additional components such as hostel/mess charges, or other miscellaneous fees depending on your specific circumstances and the college's latest updates.

For the most precise and detailed breakdown of the fees for your desired academic year, I recommend you contact the administrative staff directly via email: contact@xyzcollege.edu.

Ask your question... 

 Smart Enquiry Assistant

UniBot
Welcome! I am UniBot, the Smart Enquiry Assistant for **XYZ College**. Please note I am currently running as a test instance. I can assist you with queries on admissions, fees, courses, placements, events, sports, and hostel details. How can I help you today?

What is the current market prize of bitcoin?

UniBot
I am UniBot, the Smart Enquiry Assistant for XYZ College. I apologize, but I am only programmed to assist with specific enquiries related to XYZ College, such as admissions, fee structure, placement details, course information, event updates, sports, hostel, and general campus queries.

I cannot provide you with the current market price of Bitcoin or other general knowledge or financial information.

Please feel free to ask me any questions you may have about **XYZ College!**

Ask your question... 

Smart Enquiry Assistant

admissions, fee structure, placement details, course information, event updates, sports, hostel, and general campus queries.

I cannot provide you with the current market price of Bitcoin or other general knowledge or financial information.

Please feel free to ask me any questions you may have about **XYZ College**!

[connect me to a human, I would like to talk to any admin](#)

UniBot

I am UniBot, the Smart Enquiry Assistant for XYZ College, and I am not able to connect you directly to a human administrator.

However, I can certainly guide you on how to reach them. For queries that require administrative review or personal assistance, please contact the administrative staff directly via email at contact@xyzcollege.edu.

Thank you for your understanding!

⚠️ Escalation Suggestion: This query may require human review. Please email our administrative staff at contact@xyzcollege.edu for a detailed response.

Ask your question...



Smart Enquiry Assistant

Thank you for your understanding!

[Tell me about the placement stats of the previous year](#)

UniBot

I am UniBot, the Smart Enquiry Assistant for XYZ College. I understand that previous year placement statistics are crucial for making informed decisions about your education.

While I don't have the specific, up-to-the-minute official placement report details for XYZ College in this system, the placement data typically covers important metrics such as:

- * **Placement Rate/Percentage** (the percentage of eligible students placed).
- * **Highest Cost to Company (CTC) offered.**
- * **Average CTC or Median Salary package.**
- * **Number of Companies** that participated in the drive.
- * **Total Number of Students Placed.**

For the most accurate and officially released placement statistics from the previous year at **XYZ College**, I recommend you contact the administrative staff or the Placement Cell directly. You can reach them via our official contact email: contact@xyzcollege.edu.

Ask your question...

Conclusion:

The Smart Enquiry Chatbot MVP successfully addresses the core problems of volume, delay, and inconsistency identified in the project brief. By implementing strict scoping, utilizing grounded AI, and establishing a clear escalation path, the system immediately provides 24/7, high-quality front-line support.

Immediate Value Delivered

- **24/7 Availability:** Provides instant answers regardless of administrative working hours.
- **Consistency:** Guarantees uniform, factually grounded answers across all supported topics.
- **Workload Reduction:** Reduces administrative burden by automating repetitive, high-volume enquiries.