Proposal for AI Teaching Assistant System

12.06.2024

–

Prepared by: Innovacio Technologies

Osama Raushan
Director
Innovacio Technologies Pvt. Ltd.
36, Beck Bagan Row,
Near Quest Mall,
West Bengal, Kolkata- 700 017
+91 90072 71601
hello@innovaciotech.com

Thank you for this amazing opportunity and for taking us into consideration for working with you. This looks like an exciting and stimulating project.

Project Overview

This proposal outlines the development of an AI Teaching Assistant System that leverages a local knowledge base, general AI large models, and multiple interfaces to facilitate student Q&A and resource recommendations. The system will support the Chinese language and integrate with a Learning Management System (LMS).

Scope of Work

Functional Requirements

Overall Needs

The system will allow students to independently ask questions and receive resource recommendations using an AI model. It will use both a local knowledge base and a general AI model.

Backend Functions

1. Knowledge Base Management:
    - Upload, delete, and update text, video, and other resources.
2. Student Information Management:
    - Manage student details including registered names, classes, student numbers, and Q&A records.
3. Evaluation System:
    - Students can provide positive or negative feedback on AI answers.
    - Teachers can review feedback and categorize it.
    - Teachers can update the knowledge base to improve AI responses based on feedback.

Front-end Functions

1. Student Q&A Interface:
    - WeChat chatbot using a separate WeChat ID.

- WeChat Mini Program.
- Web page interface.

Sample Page Requirements

- Knowledge base upload page to upload text, video, and other resources.
- Web page Q&A interface.

Deployment Requirements

- The system should support cloud or local deployment.
- Capable of handling at least 500 concurrent users.

Technology Stack Requirements

1. Development Language:
   - Python or Node.js.
2. Knowledge Enhancement:
   - Using the LangChain framework.
3. Vector Database:
   - Using FAISS.
4. Graph Database:
   - Using Neo4j.
5. AI Model:
   - Using Tongyi Qianwen.

Other Requirements

- Provide source code, programming documentation, and deployment documentation to facilitate paper writing.

Detailed Plan

Phase 1: Requirements Analysis

1. **Understand Specific Needs**:
   - Gather detailed requirements from stakeholders.
   - Define the scope of the local knowledge base.
   - Identify specific LMS integration points.

2. **Technical Feasibility**:
    - Assess the feasibility of using Tongyi Qianwen for the AI model.
    - Evaluate cloud and local deployment options.

Phase 2: Design

1. **System Architecture**:
    - Design the overall system architecture integrating Django, Neo4j, and LangChain.
2. **Database Schema Design**:
    - Design schemas for the Neo4j graph database and FAISS vector database.
3. **Interface Design**:
    - Design UI/UX for the WeChat chatbot, Mini Program, and web interface.

Phase 3: Development

1. **Backend Development**:
    - Implement knowledge base management using Django.
    - Develop student information management and evaluation system.
2. **Frontend Development**:
    - Develop WeChat chatbot interface.
    - Develop WeChat Mini Program.
    - Develop web page interface.
3. **AI Integration**:
    - Integrate Tongyi Qianwen with the LangChain framework.
    - Implement vector search with FAISS.

Phase 4: Testing

1. **Unit Testing**:
    - Test individual components for functionality.
2. **Integration Testing**:
    - Ensure all components work together seamlessly.
3. **User Acceptance Testing (UAT)**:
    - Conduct UAT with a sample group of students and teachers.

Phase 5: Deployment

1. **Cloud/Local Deployment Setup**:

- Prepare cloud infrastructure or local servers.
- Deploy the system ensuring scalability for at least 500 users.

2. **Performance Testing**:
   - Conduct load testing to ensure the system can handle the required number of concurrent users.

Phase 6: Documentation and Training

1. **Documentation**:
   - Prepare detailed source code documentation.
   - Provide comprehensive deployment documentation.
   - Create user manuals for students and teachers.
2. **Training**:
   - Conduct training sessions for teachers on using the system and updating the knowledge base.

Phase 7: Maintenance and Support

1. **Ongoing Support**:
   - Provide technical support for any issues.
2. **System Updates**:
   - Regularly update the system based on user feedback and new requirements.

Team Structure

Project Team

1. **Project Manager:** Oversees project timelines, deliverables, and coordination between team members and stakeholders.
2. **Backend Developers:** Focus on developing the backend functionalities using Django, Neo4j, and integrating the AI model.
3. **Frontend Developers:** Develop the WeChat chatbot, Mini Program, and web interface.
4. **AI/ML Engineers:** Customize and integrate the Tongyi Qianwen model, and implement knowledge enhancement with LangChain.
5. **Database Engineers:** Implement and manage the FAISS vector database and Neo4j graph database.

6. **QA Engineers:** Conduct unit, integration, and performance testing.
7. **DevOps Engineers:** Handle deployment, scalability, and maintenance of the system.

Agile Methodology

We will adopt an Agile methodology, following these key principles:

1. Iterative Development: Develop the project in sprints, each lasting 2-3 weeks.
2. Continuous Feedback: Regularly gather feedback from stakeholders and end-users.
3. Incremental Delivery: Deliver functional modules in each sprint for early testing and validation.
4. Collaboration and Communication: Maintain constant communication within the team and with stakeholders.

Sprint Structure

1. Sprint Planning: Define the goals and tasks for the upcoming sprint.
2. Daily Stand-ups: Short meetings to discuss progress, roadblocks, and next steps.
3. Sprint Review: Demonstrate the completed work to stakeholders and gather feedback.
4. Sprint Retrospective: Reflect on the sprint to identify what went well and what could be improved.

Timeline

Phase 1: Requirements Analysis (1 weeks)

- Understand specific needs
- Technical feasibility assessment

Phase 2: Design (2 weeks)

- System architecture design
- Database schema design
- Interface design

Phase 3: Development (7 weeks)

- Backend development (2 weeks)
- Frontend development (2 weeks)
- AI integration (3 weeks)

Phase 4: Testing (3 weeks)

- Unit testing (1 weeks)
- Integration testing (1 week)
- User acceptance testing (1 week)

Phase 5: Deployment (1 weeks)

- Cloud/local deployment setup
- Performance testing

Phase 6: Documentation and Training (2 weeks)

- Prepare documentation
- Conduct training sessions

Phase 7: Maintenance and Support (Ongoing)

- Provide technical support
- Regular updates

Questions/Thoughts

1. **Scope of the Knowledge Base:**
    - What types of resources will be included? Are there specific formats or standards?
2. **LMS Integration:**
    - What specific LMS systems will we need to integrate with?
3. **AI Model Customization:**
    - To what extent will Tongyi Qianwen need to be customized for this application?
4. **Feedback Mechanism:**
    - How will negative feedback be categorized and managed by teachers?
5. **Performance Requirements:**

- What specific performance metrics do we need to meet (e.g., response time, system uptime)?

6. **User Load Testing:**
    - Are there specific peak usage times we need to account for in our load testing?

Deliverables

Deliverable 1: Project Architecture setup and Design (Database and Design) **- 1st Month**

Deliverable 2: Frontend and Backend Development and deployment **- 2nd Month**

Deliverable 3: AI Development and Integration **- 3rd Month**

Deliverable 4: Testing and whole project deployment **- 4th Month**

Addressing Your Questions

1. **Chinese Language AI Model**:
    - We will collaborate with your office team for the integration of the Chinese language AI model (Tongyi Qianwen) if needed.
2. **WeChat Mini Program**:
    - We have experience developing WeChat Mini Programs, ensuring seamless interaction and user experience.
3. **LangChain Framework**:
    - We have expertise in using the LangChain framework for knowledge enhancement and can integrate it effectively into the system.
4. **FAISS for Vector Database**:
    - We are proficient in implementing and managing FAISS for efficient vector searches and database operations.
5. **Neo4j for Graph Database**:
    - We have experience using Neo4j and can leverage it for managing relationships and connections within the data effectively.
6. **Tongyi Qianwen**:
    - Although we haven't directly worked with Tongyi Qianwen, we will collaborate with your in-house team to ensure its successful integration and customization as needed.

Team Structure and Number of Developers

Core Team Members and Roles

1. **Project Manager** (1):
    - Oversees project timelines, deliverables, and coordination between team members and stakeholders.
2. **Backend Developers** (1):
    - Focus on developing the backend functionalities using Django, Neo4j, and integrating the AI model.
3. **Frontend Developers** (1):
    - Develop the WeChat chatbot, Mini Program, and web interface.
4. **AI/ML Engineers** (1):
    - Customize and integrate the Tongyi Qianwen model, and implement knowledge enhancement with LangChain.
5. **Database Engineers/ DevOps Engineers** (1):
    - Implement and manage the FAISS vector database and Neo4j graph database.
    - Handle deployment, scalability, and maintenance of the system
6. **QA Engineers** (1):
    - Conduct unit, integration, and performance testing.

Total Number of Developers

- **Core Development Team**: 4 developers
    - Backend Developers: 1
    - Frontend Developers: 1
    - AI/ML Engineers: 1
    - Database Engineers: 1

This structure ensures a balanced workload and expertise across all areas of the project, allowing us to meet the project requirements and deliver a high-quality AI Teaching Assistant System.

Similar Project URL

Here is some general examples of our work in related domains:

- **AI-Powered Educational Tools**: We have developed AI-driven platforms for educational purposes, including automated essay grading systems and personalized learning assistants.

  https://virtualwritingtutor.com/

Also you can check our portfolio here:

https://docs.google.com/document/d/1X5X5TJO-RJ9pfMhoMDx426URA2x8F8R8UO-OA0ekI_k/edit?usp=sharing

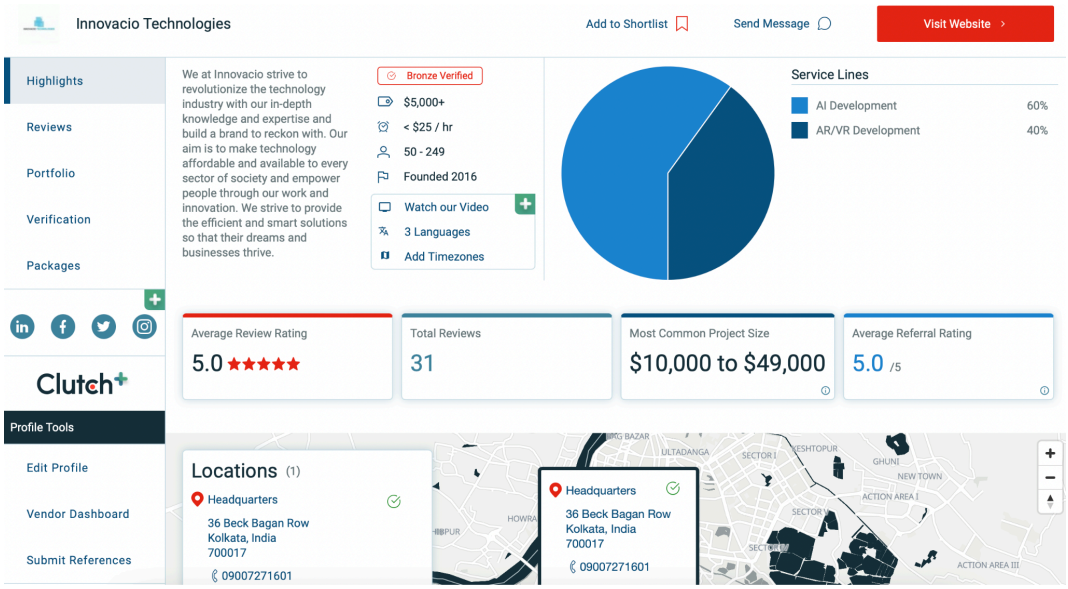
If you need more specific case studies or details, we can arrange a meeting to discuss past projects and their outcomes in more detail.

Commercials :

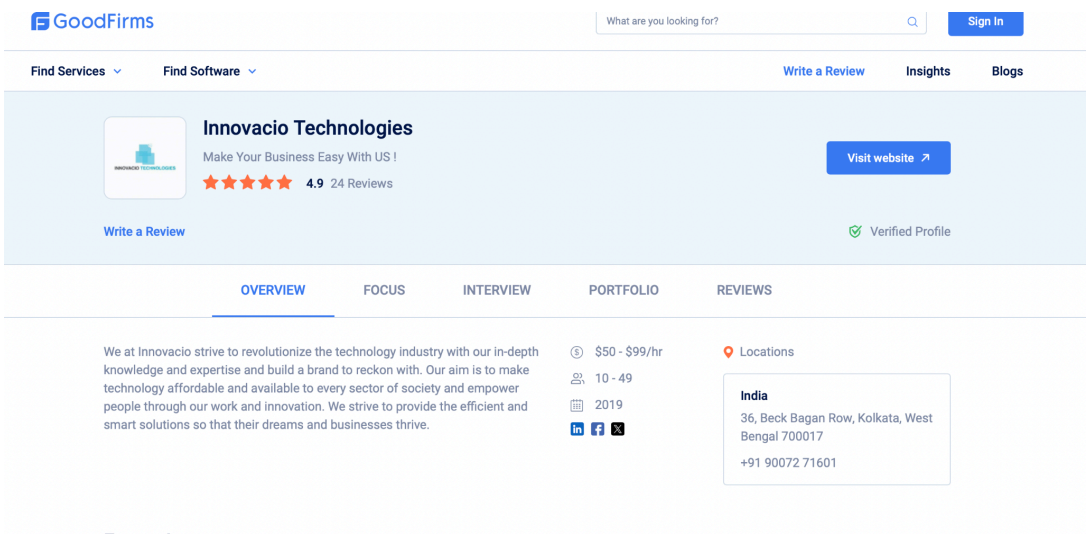
Component	%	Amount (USD)
Advance	15 %	1800
Deliverable 1: Project Architecture setup and Design (Database and Design) - 1st Month	20 %	2400
Deliverable 2: Frontend and Backend Development and deployment - 2nd Month	25 %	3000
Deliverable 3: AI Development and Integration - 3rd Month	25%	3000
Deliverable 4: Testing and whole project deployment - 4th Month	15 %	1800
Total amount		12000

Listen to what other clients are talking about us 👍

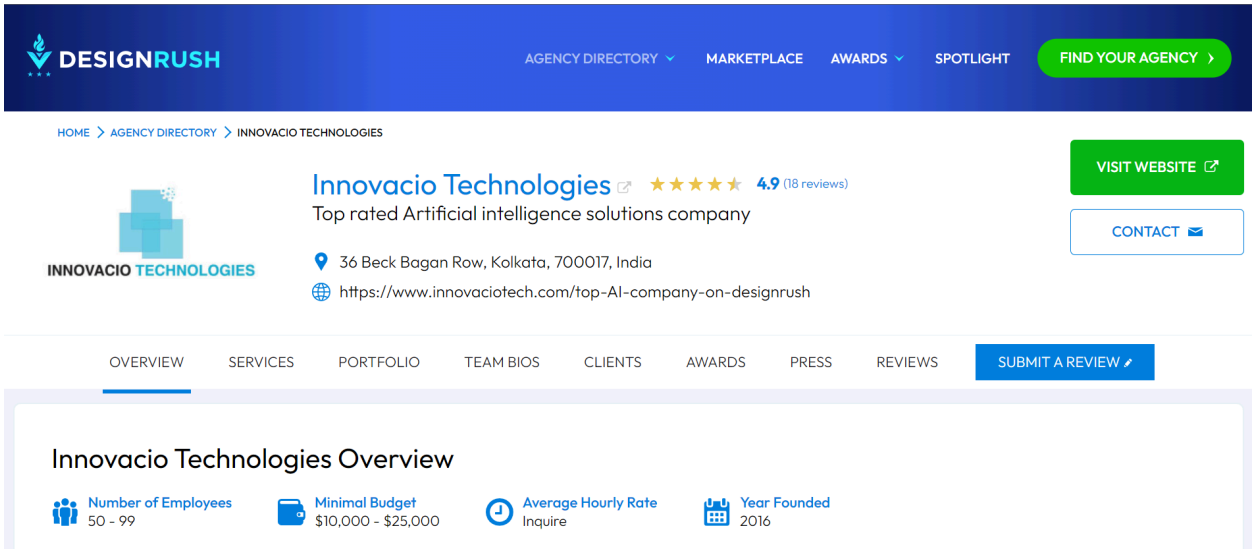
Clutch.co



Goodfirms



Design Rush



Please let us know if you need any further information or proposal. We look forward to the opportunity to work with you on this project.

Thank you!

Innovacio Technologies Pvt. Ltd.

(CIN) U72900WB2022PTC256303

hello@innovaciotech.com

www.innovaciotech.com