Project Design – Solution Architecture

Team ID: LTVIP2026TMIDS84504

Project Name: TransLingua: AI-Powered Multi-Language Translator

Maximum Marks: 4 Marks

Solution Architecture Overview

Solution architecture defines how technology components work together to solve a specific business problem. It connects user needs with technical implementation to ensure the system is efficient, reliable, and scalable.

Objectives of the Solution Architecture

- **Identify the Best Technology Solution**
  Select appropriate technologies such as Streamlit, Python, and AI translation APIs to efficiently address language translation challenges.
- **Describe System Structure & Functionality**
  Explain how the user interface, translation engine, and backend services interact to process user input and generate translated output.
- **Define Features & Development Phases**
  Outline key features such as automatic language detection, real-time translation, and user-friendly interface, along with planned development stages.
- **Provide Technical Guidelines & Specifications**
  Establish standards for system performance, scalability, and maintenance to ensure reliable delivery and future expansion.

TransLingua System Architecture Components

1. **User Interface (Frontend)**

- Built using Streamlit
- Accepts text input and language selection
- Displays translated output

2. **Backend Processing**

- Python-based processing logic
- Handles input validation and request handling

3. **AI Translation Engine**

- Google Generative AI / NLP model
- Detects language and generates accurate translations

4. **Integration Layer**

- Connects frontend with AI services through APIs
- Manages request and response flow

Key System Features

✓ Real-time multi-language translation
✓ Automatic language detection
✓ Fast and responsive interface
✓ Scalable and easy integration