Software Requirements Specification (SRS)

English to Hindi Language Translator Web Application

Technology Stack: Python Flask, Transformers Library
Model: Helsinki-NLP/opus-mt-en-hi
Deployment Platform: Render

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1. Introduction

Purpose: This document defines the requirements for an English to Hindi Language Translator Web Application that uses the NLP model Helsinki-NLP/opus-mt-en-hi for machine translation. Scope: The system allows users to input English text and receive Hindi translations through a web interface.

2. Overall Description

Product Perspective: The application is a web-based system consisting of a frontend interface and a Flask backend integrated with a Hugging Face transformer model. Operating Environment: - Python 3.9+ - Flask Framework - Transformers & Torch Libraries - Web Browser (Chrome, Edge, Firefox) - Deployment on Render Cloud Platform

3. Functional Requirements

- Provide textarea for English input. - Validate that input is not empty. - Load and use Helsinki-NLP/opus-mt-en-hi model. - Generate Hindi translation. - Display translated output properly in Unicode format. - Handle server and model errors gracefully.

4. Non-Functional Requirements

Performance: Translation response time should be under 5 seconds. Security: Input validation and HTTPS support. Usability: Simple and responsive user interface. Reliability: Proper exception handling and minimum 95% uptime.

5. System Architecture

User → Web Browser → Flask Backend → Tokenizer & Model → Hindi Output → User

6. Deployment Requirements

- Include requirements.txt (Flask, transformers, torch, gunicorn). - Include Procfile: web: gunicorn app:app - Use PORT environment variable provided by Render. - Ensure model loads at startup for efficiency.

7. Future Enhancements

- Add Hindi to English translation. - Add text-to-speech feature. - Add user authentication and translation history. - Provide REST API endpoint.