Software Requirements Specification (SRS)

Project Title

English to Hindi Language Translator Web Application

1. Introduction

Purpose: This SRS describes requirements for an English-to-Hindi translation web application using NLP model Helsinki-NLP/opus-mt-en-hi, built with Python Flask and deployed on Render.

Scope: The system allows users to input English text and receive Hindi translations in real time via a web interface.

2. Overall Description

Product Functions:

• Accept English text input • Process input using NLP model • Generate Hindi translation • Display translated output • Handle requests via REST API

User Classes:

General users, students, and developers/admins.

Operating Environment:

Python 3.10+, Flask, Hugging Face Transformers, PyTorch, Render Cloud, modern web browsers.

3. System Architecture

Workflow:

1. User enters text 2. Browser sends POST request 3. Flask processes request 4. NLP model generates translation 5. Response returned to UI

4. Functional Requirements

User Interface:

Input field, translate button, output display, loading indicator, responsive design.

API Endpoint:

Endpoint: /translate (POST)

Request JSON:

```
{ "text": "Hello world" }
```

Response JSON:

```
{ "translation": "■■■■■■ ■■■■■■" }
```

Error Handling:

Empty input validation, graceful server error handling, retry option.

5. Non■Functional Requirements

Performance: Response ≤ 5 seconds.

Reliability: ≥ 99% uptime.

Security: HTTPS and input sanitization.

Usability: Simple and intuitive UI.

6. External Interface Requirements

User Interface: Responsive web form.

Software Interface: Hugging Face Transformers & PyTorch.

Communication: HTTP/HTTPS REST API.

7. Deployment Requirements

Render Deployment Steps:

1. Push code to GitHub 2. Connect repo to Render 3. Install dependencies 4. Start app using python app.py

8. Future Enhancements

Multi-language support, voice input, translation history, authentication, batch translation.

9. Acceptance Criteria

Successful deployment, functional API, responsive UI, acceptable translation accuracy.

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