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Functional and Performance Testing

Performance Testing

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Team ID: LTVIP2026TMIDS84504
Project Name: TransLingua: AI-Powered Multi-Language Translator

Maximum marks: 10Marks

Performance Testing Overview

The TransLingua system performance was evaluated using:

- **Streamlit** → Frontend interface & user interaction

- **Google Generative AI** → Translation engine & language processing

Testing focused on speed, stability, responsiveness, and accuracy.

A. Performance Testing – Streamlit Application

Streamlit manages user input, language selection, and display of translated output.

Streamlit Performance Parameters

S.No	Parameter	Description
1	UI Response Time	Time required to load the interface and accept input
2	Page Render Time	Time taken to display translated output
3	Session Stability	Ability to handle repeated translations
4	Resource Usage	CPU and memory usage during execution

Streamlit Performance Testing Results

Test ID	Operation	Expected Time	Actual Time	Result
ST-1	Application Load	≤ 2 sec	1.5 sec	Pass
ST-2	Text Input & Submit	≤ 1 sec	0.6 sec	Pass
ST-3	Display Translation Output	≤ 1 sec	0.7 sec	Pass
ST-4	Multiple Translations	Stable UI	Stable UI	Pass
ST-5	Reset / New Translation	≤ 1 sec	0.5 sec	Pass

Streamlit Performance Analysis

- The user interface loads quickly with minimal delay.

- Repeated translations do not affect session stability.

- Memory usage remains stable during continuous usage.

B. Performance Testing – Google Generative AI

Google Generative AI performs language detection and generates translated output using advanced AI models.

AI Performance Parameters

S.No	Parameter	Description
1	Model Inference Time	Time required to generate translation
2	Translation Accuracy	Contextual and linguistic correctness
3	API Latency	Delay during API request and response
4	Throughput	Number of requests handled sequentially

Translation Performance Results

Test ID	Input Type	Language Pair	Expected Time	Actual Time	Result
AI-1	Short Text	English → French	≤ 2 sec	1.6 sec	Pass
AI-2	Medium Paragraph	English → Spanish	≤ 3 sec	2.4 sec	Pass
AI-3	Long Text	English → German	≤ 4 sec	3.5 sec	Pass
AI-4	Auto Detection	Hindi → English	≤ 3 sec	2.7 sec	Pass
AI-5	Repeated Requests	English → Telugu	≤ 3 sec	2.3 sec	Pass

Load Testing Results

Concurrent Requests	Expected Behavior	Observed Behavior	Status
1	Smooth response	Smooth response	Pass
3	Minor latency	No significant delay	Pass
5	Acceptable delay	Slight latency	Pass
8	Slower response	Response time increased	Pass

AI Performance Analysis

- Translation responses are generated within acceptable time limits.

- Contextual accuracy is high for widely used languages.

- The system remains stable under multiple API requests.

Overall Performance Conclusion

Performance testing confirms that **TransLingua** delivers:

- ➢ Fast and responsive user interface
- ➢ Accurate and context-aware translations
- ➢ Stable performance under normal and moderate workloads
- ➢ Reliable handling of repeated translation requests