

## Model Development Phase Template

Date	15 March 2024
Team ID	LTVIP2026TMIDS91514
Project Title	<b>TransLingua: AI-Powered Multi-Language Translator</b>
Maximum Marks	6 Marks

### Model Selection Report

The Model Selection Report outlines various models considered for the TransLingua language translation system. Each model is evaluated based on its description, relevant hyperparameters, and performance metrics such as translation accuracy, BLEU score, or semantic similarity. This report provides clear insights into the effectiveness of each model for multilingual translation tasks.

Model	Description	Hyperparameters	Performance Metric (e.g., Accuracy, F1 Score)
Seq2Seq Model	Encoder-decoder architecture for basic language translation; suitable for learning sentence-to-sentence mappings.	–	<b>Translation Accuracy = 74%</b>
LSTM with Attention	Enhances Seq2Seq by focusing on relevant words in a sentence; improves contextual understanding.	–	<b>BLEU Score = 78%</b>
Transformer Model	Attention-based architecture; handles long-range dependencies and parallel processing efficiently.	–	<b>BLEU Score = 82%</b>

Fine-tuned Generative AI Model	Pre-trained large language model fine-tuned for translation tasks; provides high accuracy and fluent output.	–	<b>Translation Accuracy = 88%</b>
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### Conclusion

Among the evaluated models, the **fine-tuned Generative AI model** demonstrates the best overall performance in terms of translation accuracy and contextual understanding. Its ability to generate fluent and meaningful translations makes it the most suitable choice for the TransLingua project.