NEURAL MACHINE TRANSLATION

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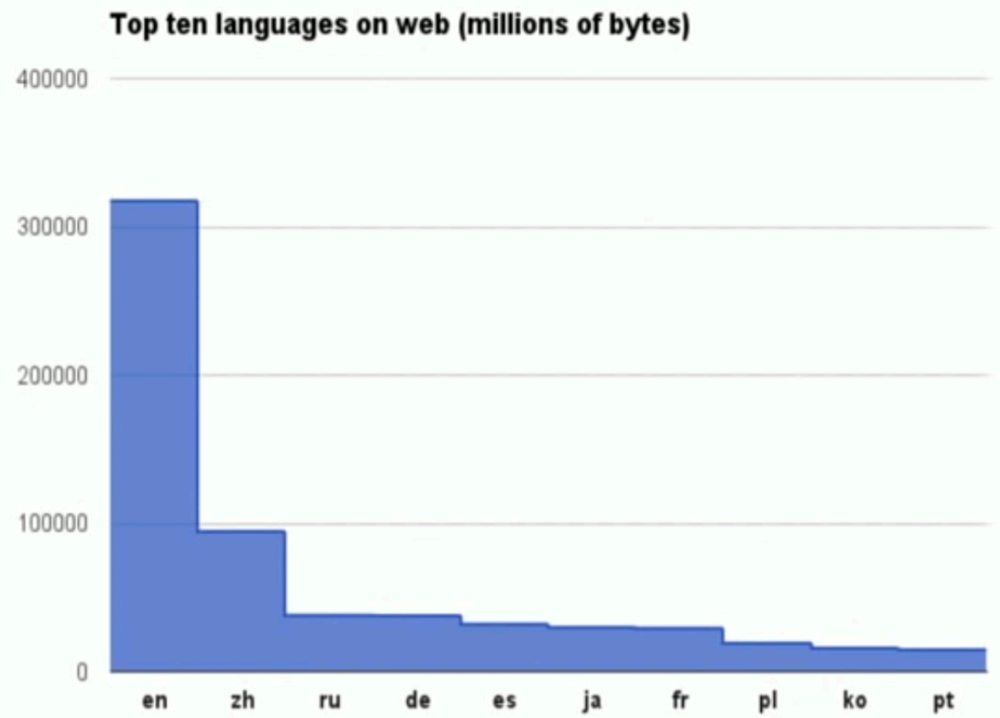
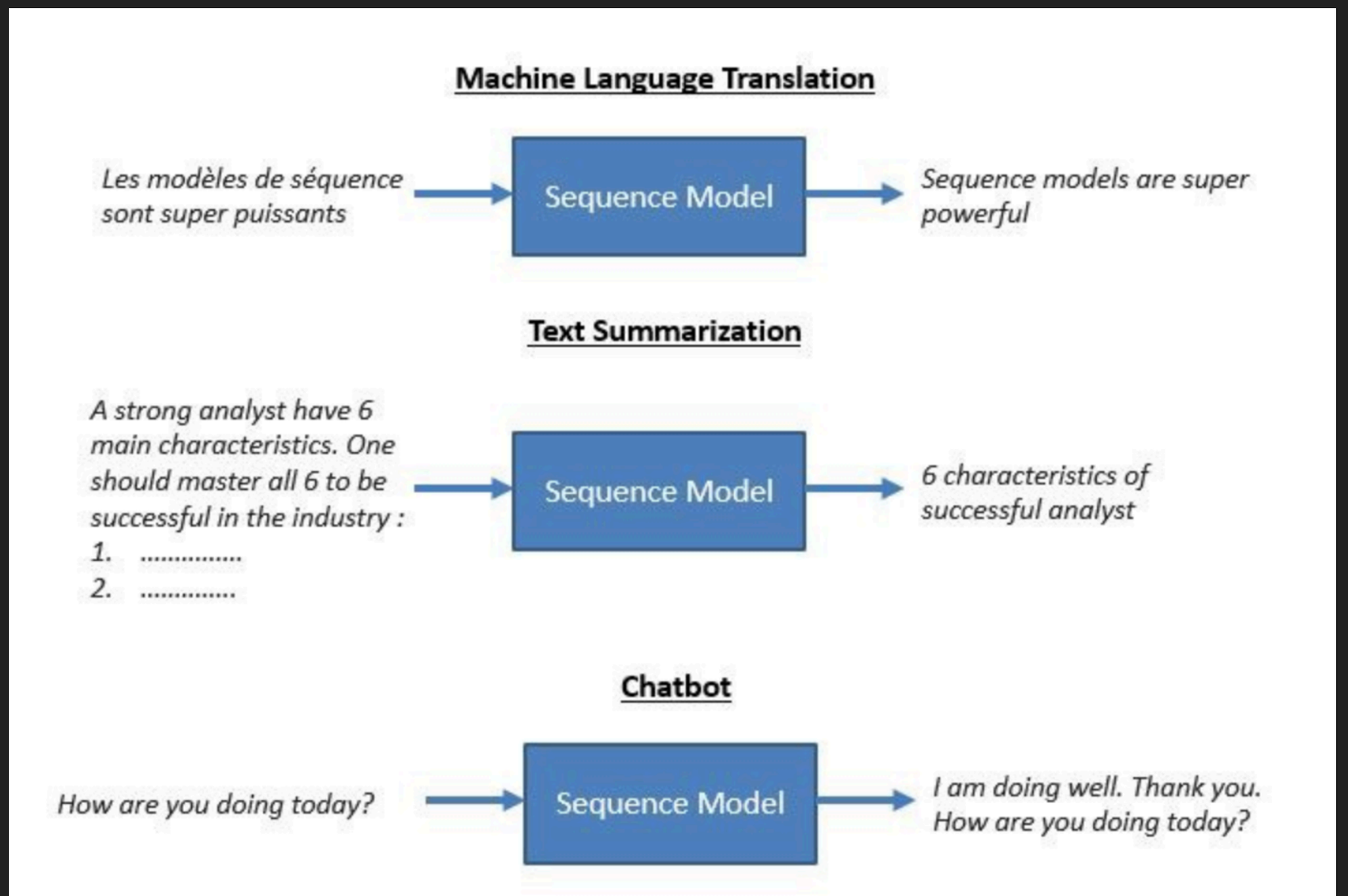
WHY IS MACHINE TRANSLATION IMPORTANT?

- **50%** of Internet content is in English.
- Only **20%** of the world's population speaks English.



ARE TRANSLATIONS ONLY FOR COMPANIES LIKE GOOGLE?

WHAT IS SEQUENCE TO SEQUENCE MODELLING?

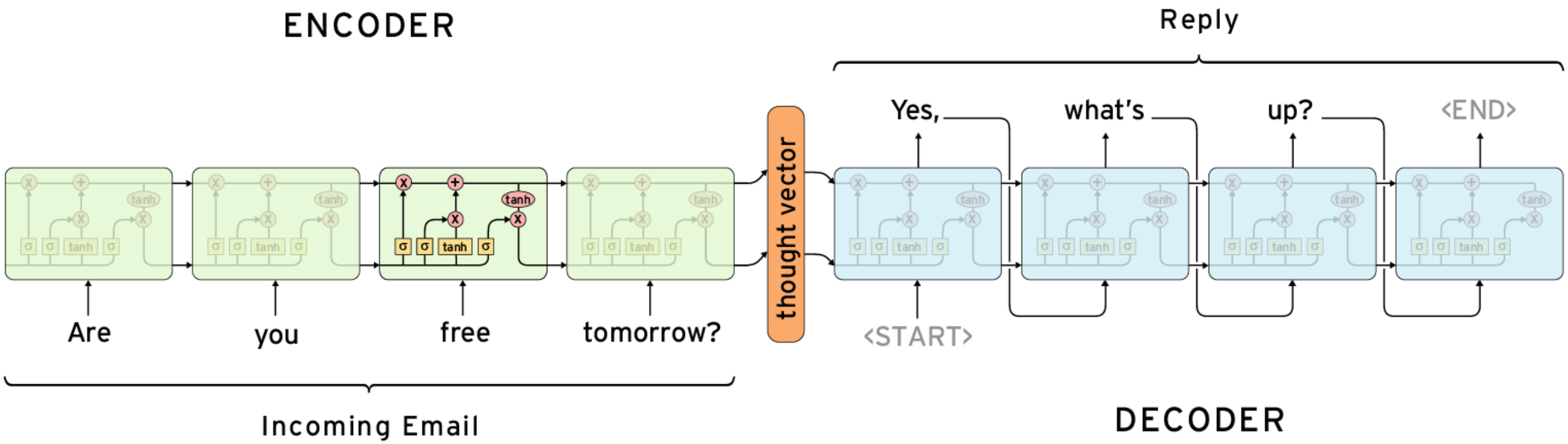


Source https://www.analyticsvidhya.com/blog/2018/04/sequence-modelling-an-introduction-with-practical-use-cases/

Problem Statement

- Translate Text from English to Hindi using Seq2Seq Modelling
- We are using Word Level Translation
- The data for this problem is available on Kaggle
- The methodology used here can be extended to any sequence to sequence problem

ENCODER-DECODER ARCHITECTURE



TEACHER FORCING DURING TRAINING

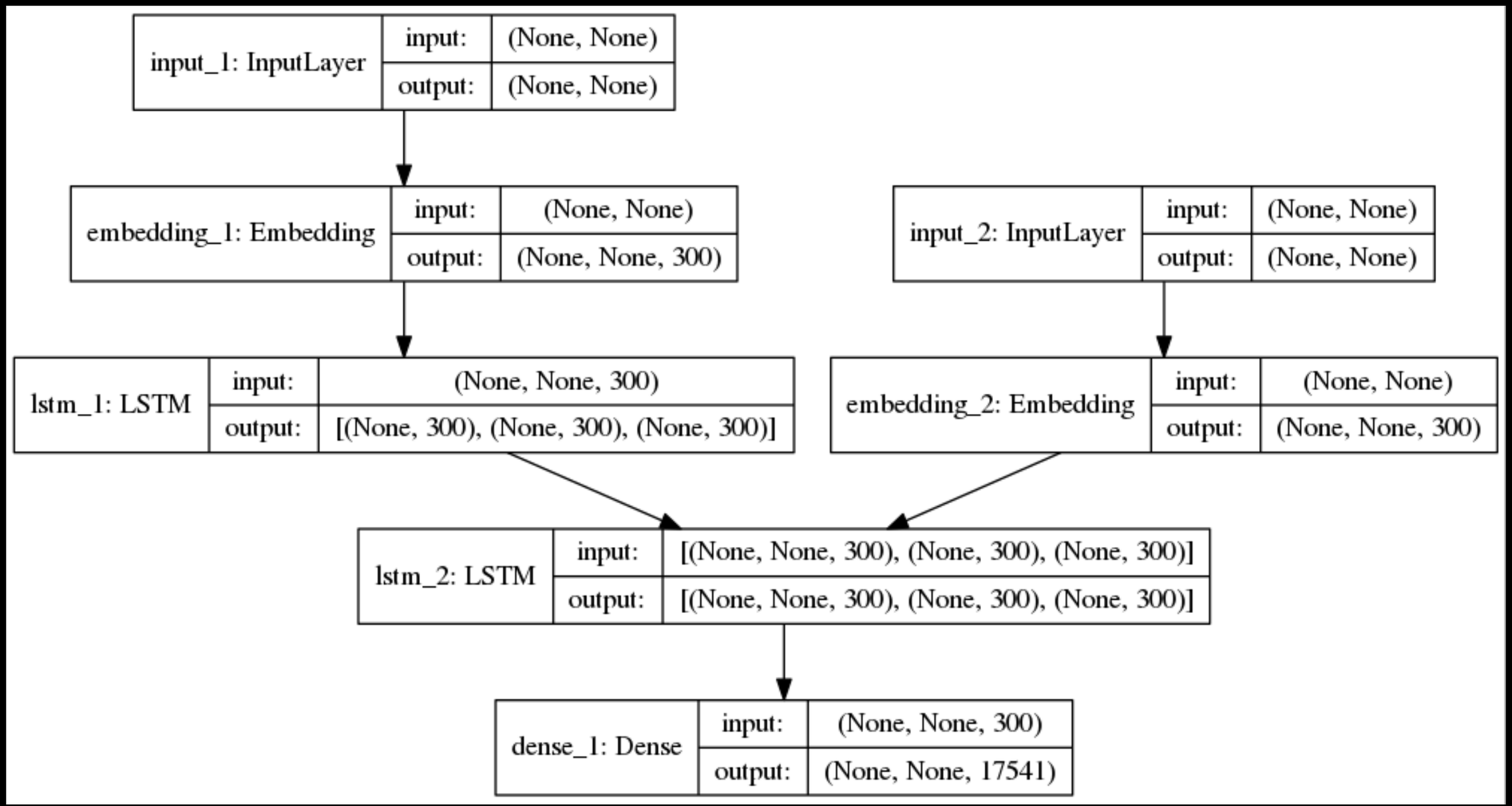
- Decoder behaves differently in Training and Inference
- During training, we use a mechanism called Teacher Forcing
  - “Teacher Forcing is a mechanism in which during the training the model receives the ground truth output y(t) as input at time t+1”

Consider the following example:

मैं बैंगलोर में रहता हूँ

NAIVE APPROACH			TEACHER FORCING	
X	yhat		X	yhat
START	हम		START	हम
START,हम	बेंगलोर		START,मैं	बेंगलोर
START,हम,बेंगलोर	रहते		START,मैं,बेंगलोर	रहते
START,हम,बेंगलोर,रहते	हैं		START,मैं,बेंगलोर,में	रहता
START,हम,बेंगलोर,रहते,हैं	END		START,मैं,बेंगलोर,में,रहता	हैं
			START,मैं,बेंगलोर,में,रहता,हूँ	END

ARCHITECTURE OF THE MODEL



CONCLUSION

- Add more data
- Attention Mechanisms can be used to reduce the loss
- Use Dropouts and other regularization techniques
- Use Bidirectional LSTMs in the Encoder or multilayered LSTMs
- Use Beam Search
- Use BLEU Score to evaluate the model