Auto MT Quality Prediction Solution and Best Practice

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Agenda

01 Program overview

02 Data collection and model training

03 Perfect MT scenario

04 Inference acceleration

05 Future works

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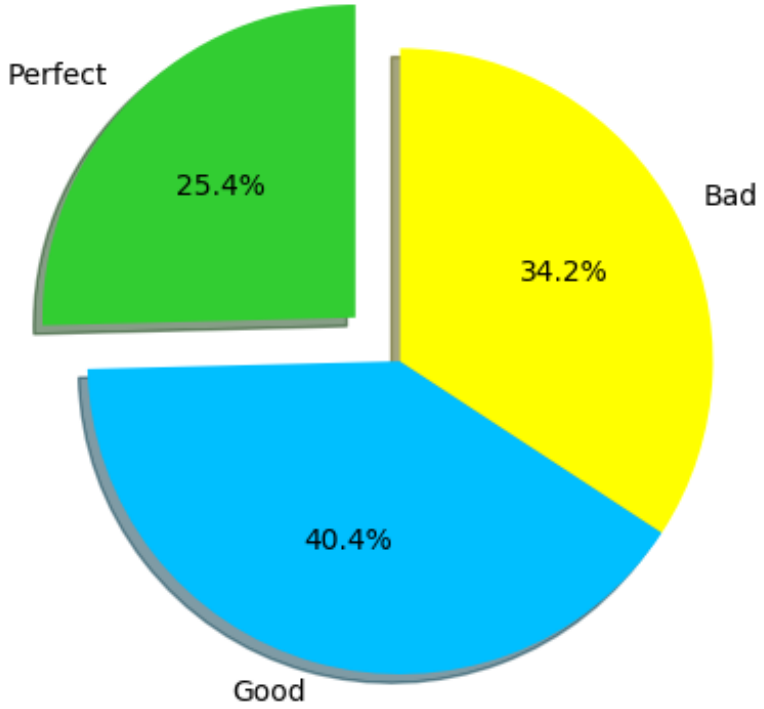
Program overview

Why prediction is needed



Perfect: PE% = 0 **Good**: 0 < PE% < 20% **Bad**: PE% > 20%

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Program overview

POC	Model fine- tune	Deploy to Stag.	Deploy to Prod.	Scenarios
• Data collection • Data washing • Conceptual design • Result analyze • Prove of concept	• Added source English as feature(English + MT as input, PE as the label) • Added regression to get linear output • Generated training data from fuzzy/ICE • Validation framework (correlation scatter diagram with actual PE etc.) • Trained models	• Model validation by real data • Load balancing by using multiple instances • Model performance against 25,000 new words project (5-10 in average) • Quality index invented and patent applied	• Model size reduction • Further validate the model by running pilot projects • Deploy trained models in DECC (CPU only, with load balancer) • OpenVINO inference accelerator (CPU) • Tensor RT ML inference accelerator validation (GPU) • Exclusion rules • Integration with TMS	• Perfect MT scenario • RAW MT quality auto scoring scenario • Engine quality auto evaluation scenario

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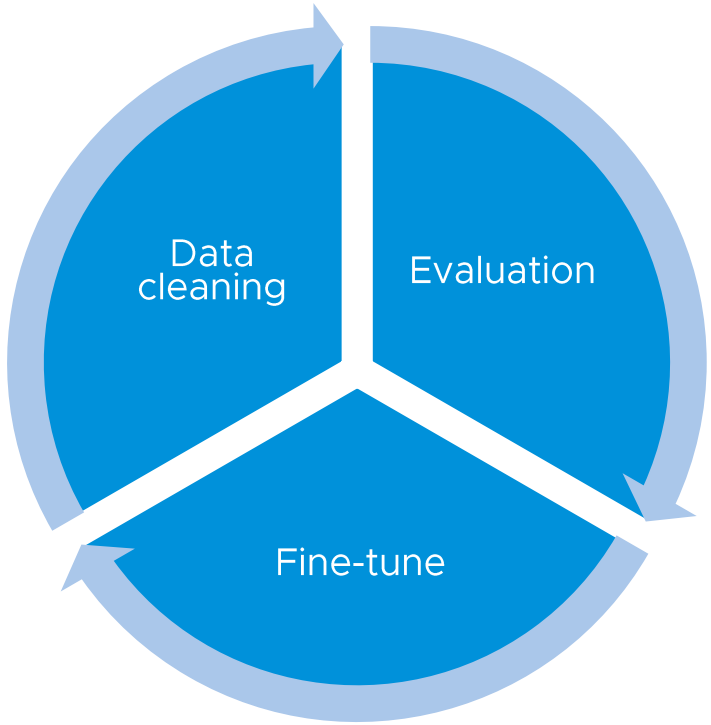
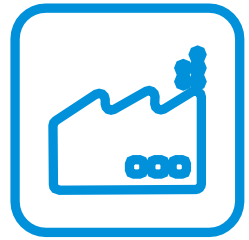
Data collection and model training

Automated Data collection
(Source, MT , human translation, PE)





Integrate into production

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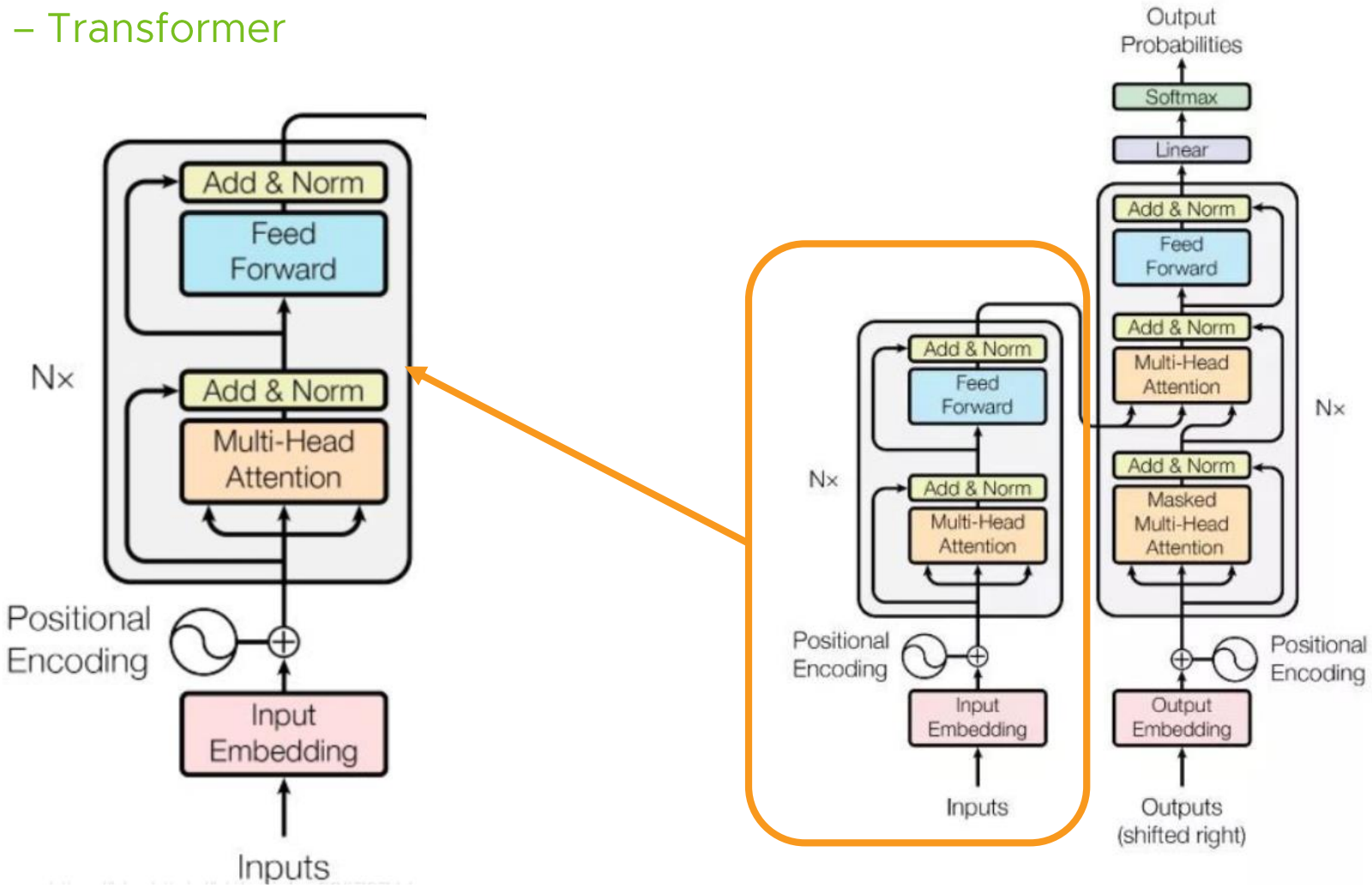
Data collection and model training

Algorithm – Transformer



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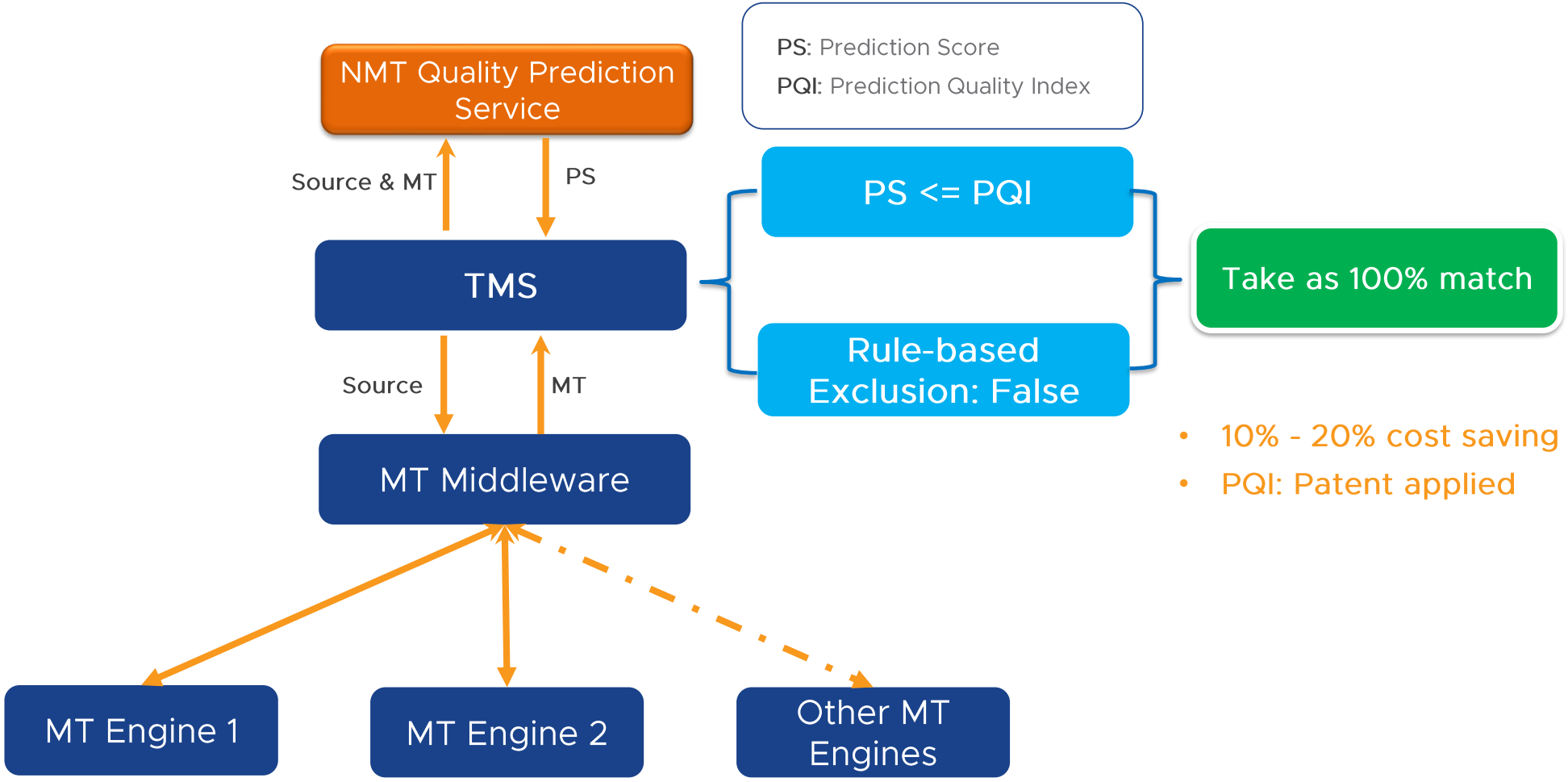
Perfect MT scenario



- 10% - 20% cost saving
- PQI: Patent applied

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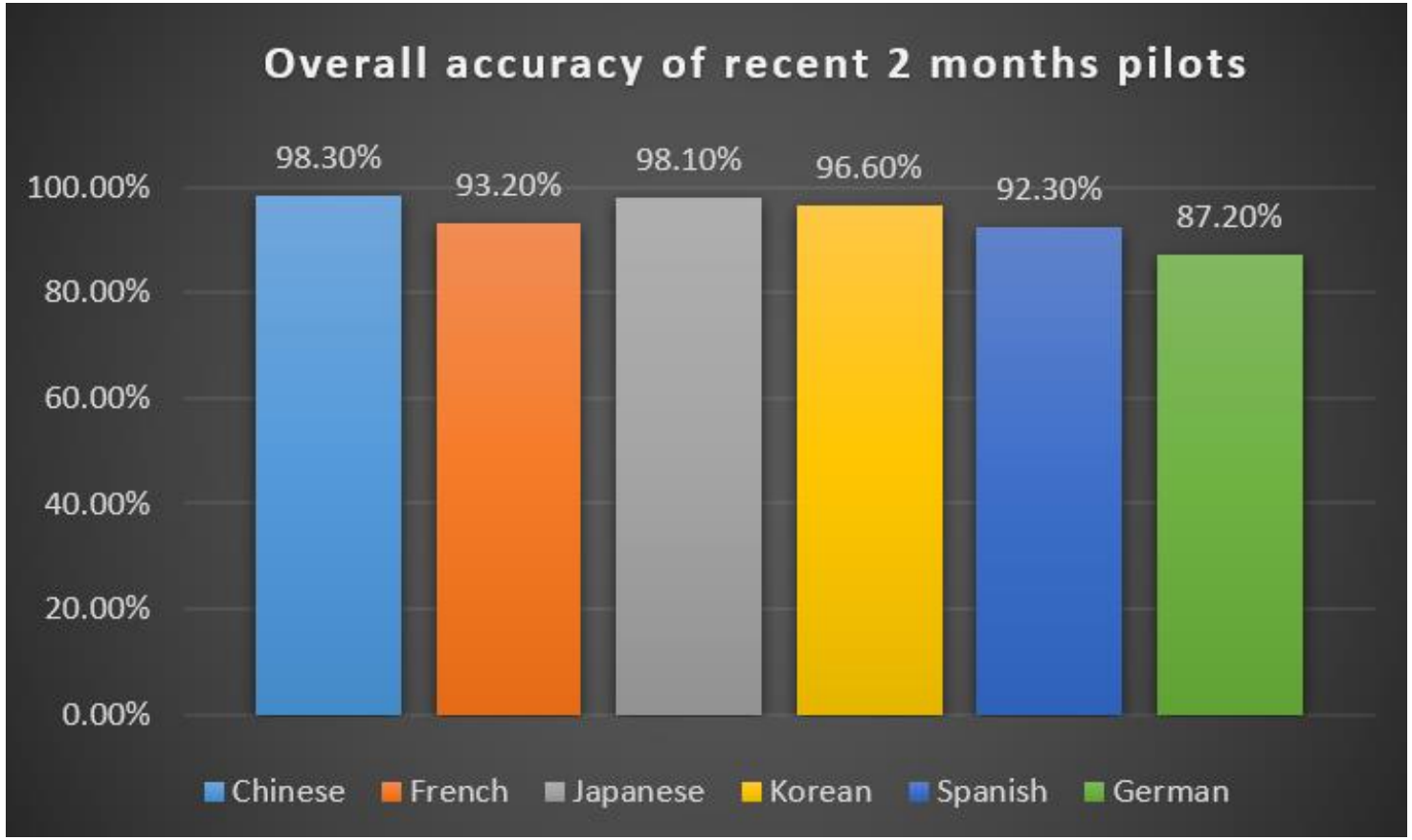
Perfect MT Scenario

Overall accuracy



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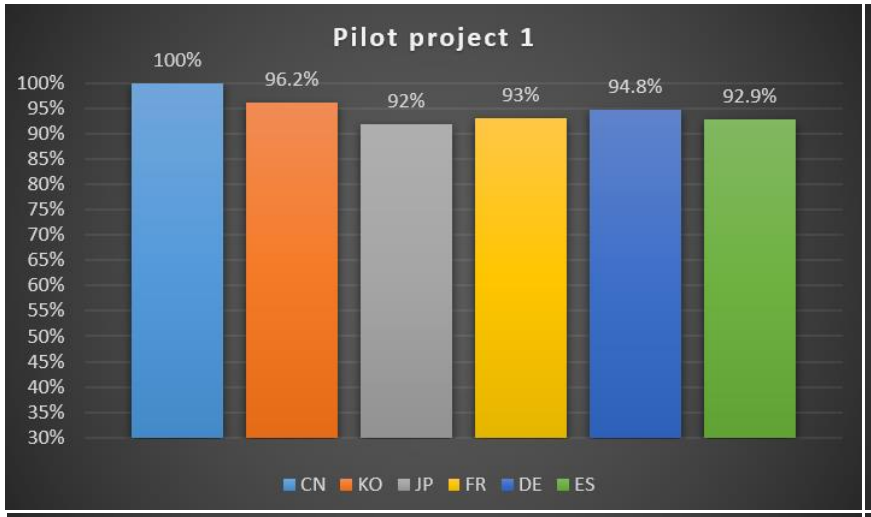
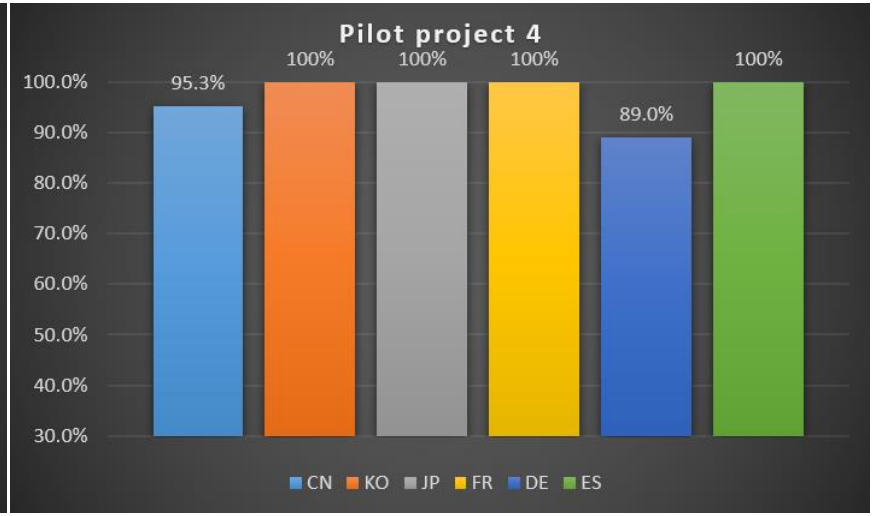
Perfect MT Scenario





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Perfect MT Scenario

Typical prediction failure example

DE golden MT that human linguist marked as “bad”:

Source:

Directory sync is handled by the connector component of the service and can only be enabled on one connector instance at a time.

MT:

Die Verzeichnissynchronisierung wird von der Konnektorkomponente des -Diensts durchgeführt und kann jeweils nur auf einer Konnektorinstanz aktiviert werden.

Human MTPE:

Die Verzeichnissynchronisierung wird von der Connector-Komponente des Diensts durchgeführt und kann jeweils nur auf einer Connector-Instanz aktiviert werden.

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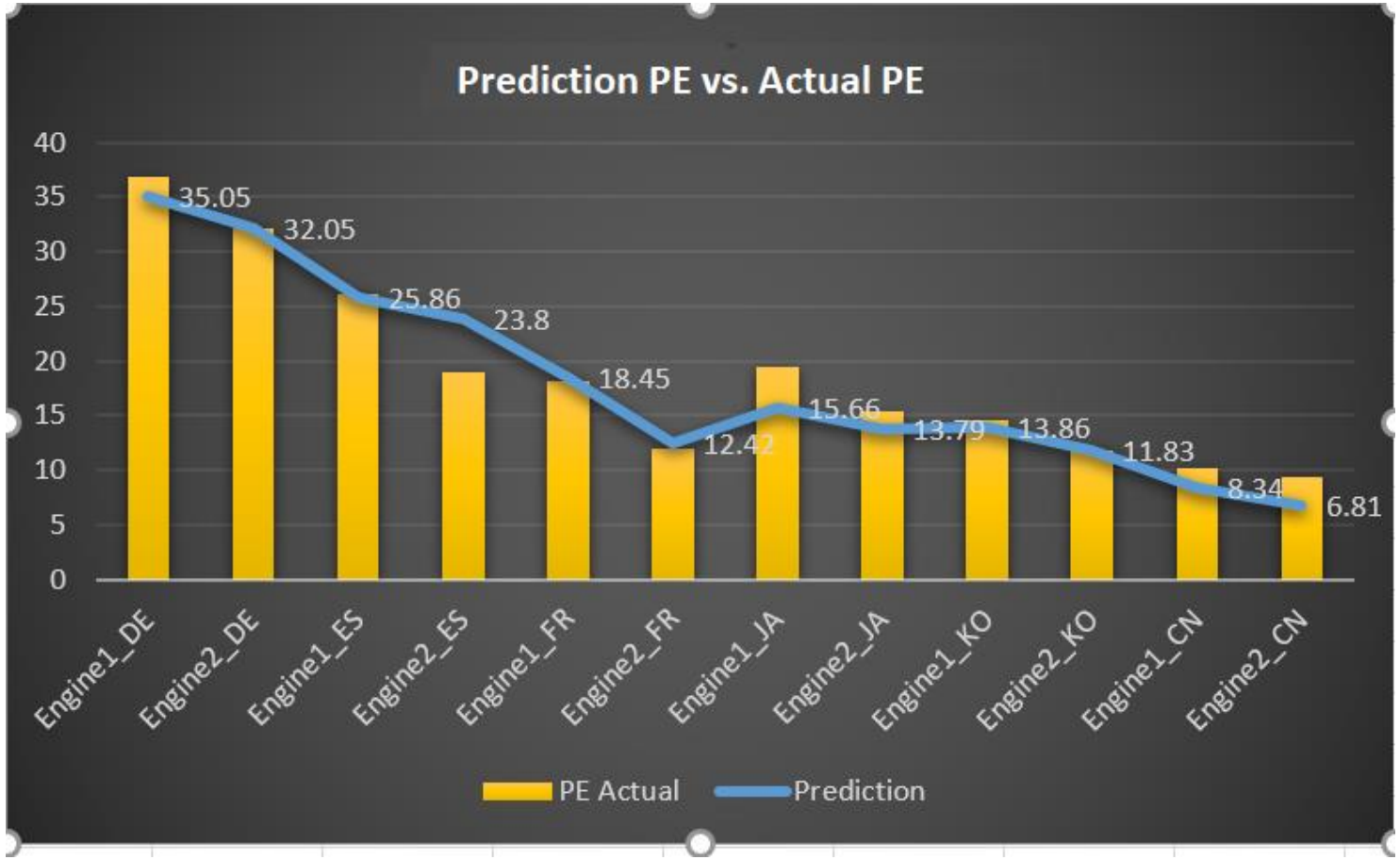
Prediction PE vs. Actual PE



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ML Model Inference Acceleration Solutions

Inference time comparison

CPU without acceleration:

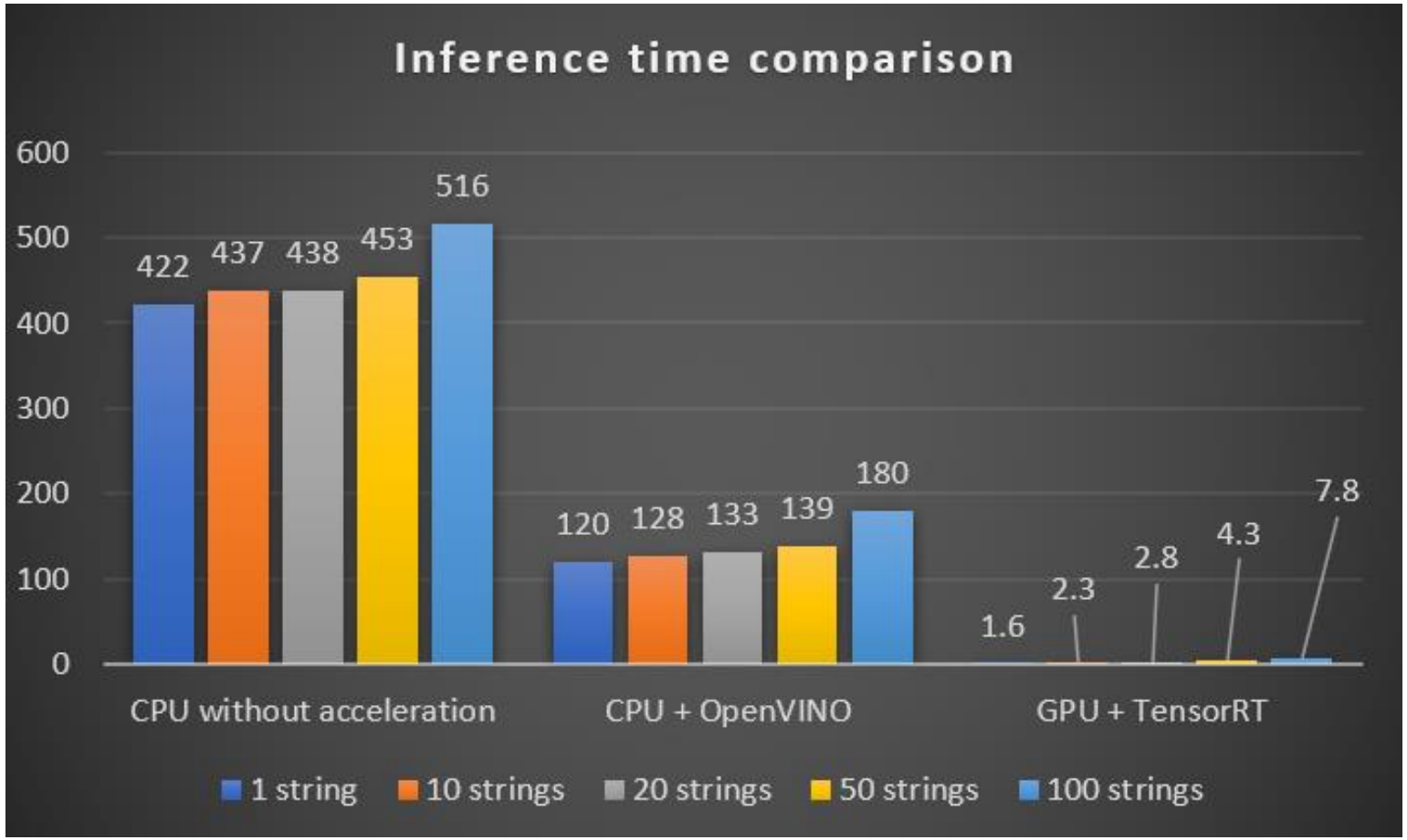
400 ms/string

CPU + OpenVINO

130 ms/string, 3 x

GPU + TensorRT:

2.8 ms/string, 140 x



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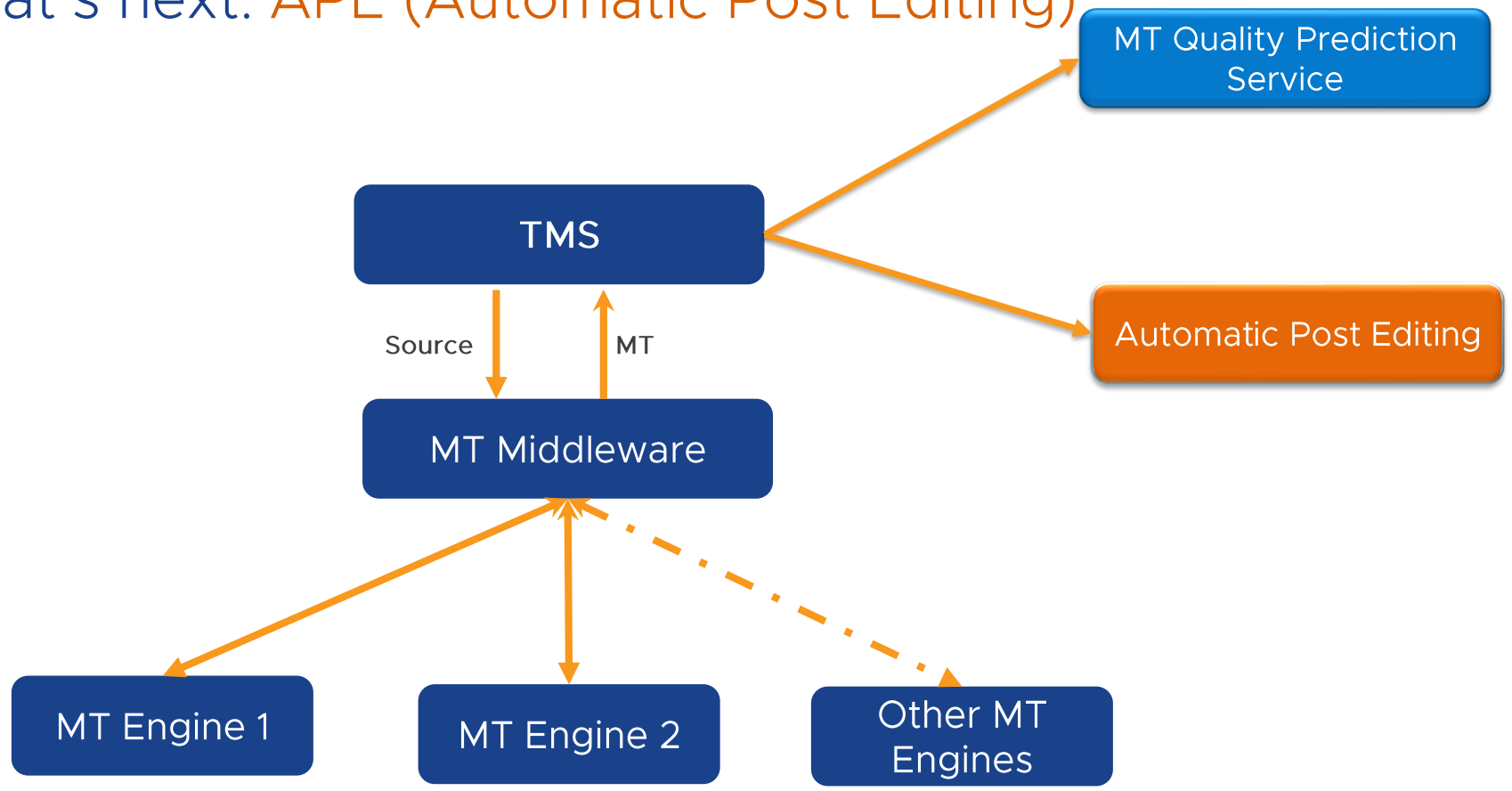
What's next: APE (Automatic Post Editing)



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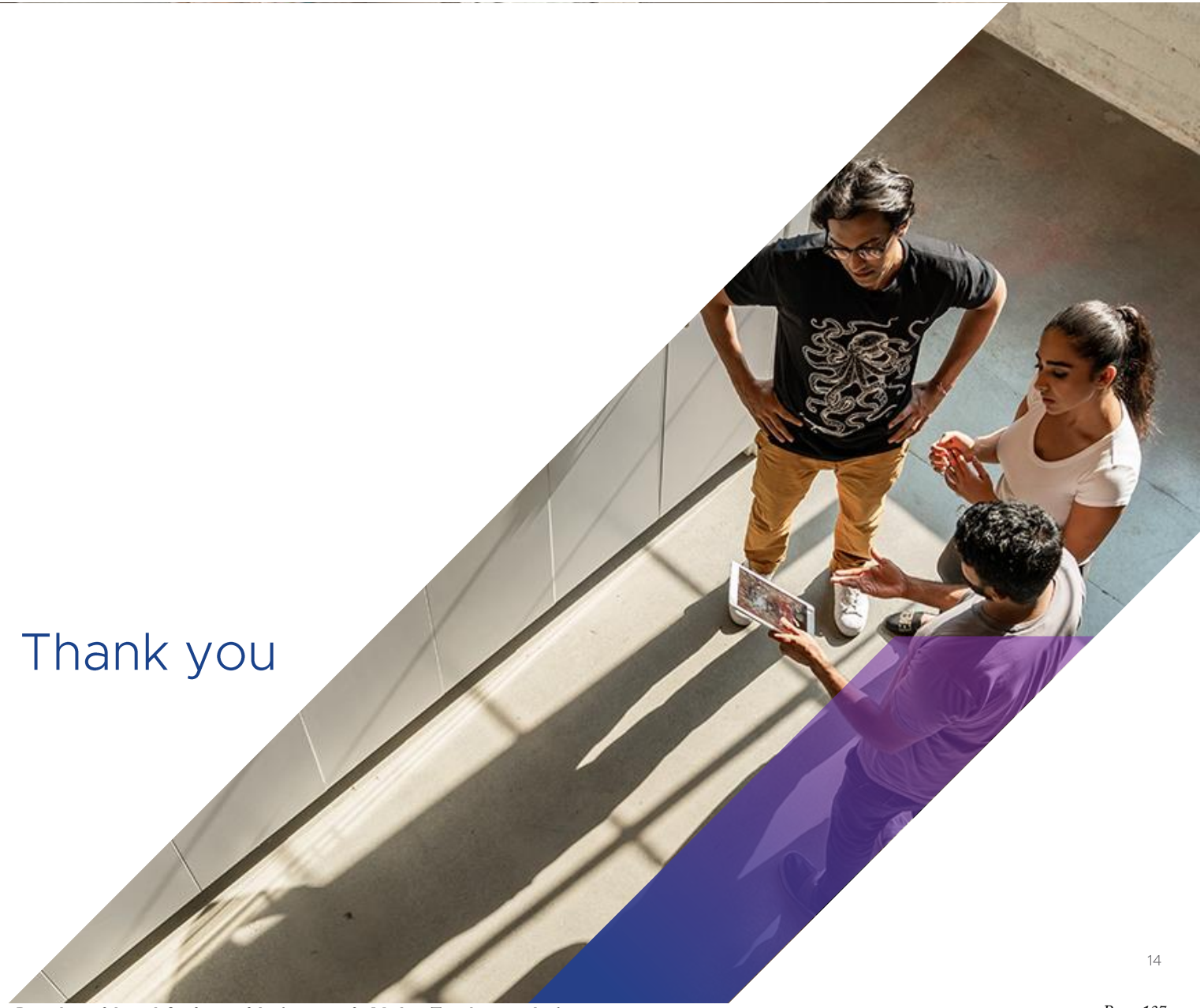
Q&A

Thank you



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