

MTN GHANA

Tɛkyerɛma Pa Hackathon 2026

AI and Language Technologies

Leveraging Language Technologies for Inclusive Solutions

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Language Technology and Inclusion

Many Ghanaian languages are low-resource languages

Limited Data

Limited Language
Representation

Language Technology and Inclusion

LANGUAGE BARRIERS

- Unfamiliar language
- Difficult to understand
- Limited local context

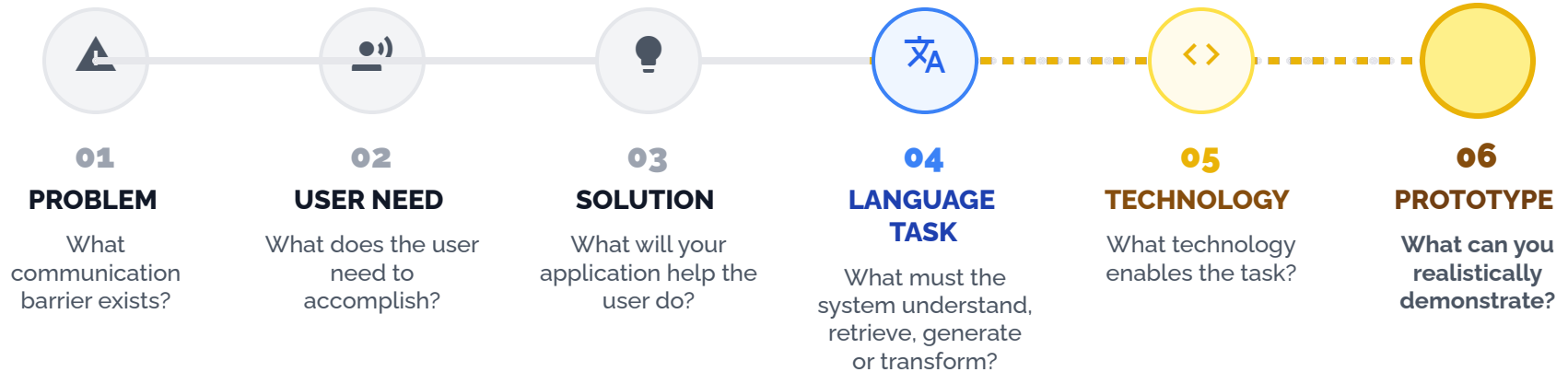
ACCESSIBILITY BARRIERS

- Difficult to perceive
- Difficult to navigate
- Difficult to understand
- Difficult to operate

DIGITAL EXCLUSION

Inclusive solutions consider both language and accessibility

From Problem to Prototype



Natural Language Processing (NLP)

The use of computational methods for understanding and generating human readable text (or speech)

Language Analysis or Natural Language Understanding (NLU)

TEXT (INPUT)

"My money has not arrived."



STRUCTURED INFORMATION

Intent: **Complaint**
Topic: **Transaction**
Sentiment: **Negative**

Language Synthesis or Natural Language Generation (NLG)

STRUCTURED INFORMATION

Type: **Transaction delayed**
Status: **Processing**

TEXT (OUTPUT)



"Your transaction is still being processed."

What capabilities do NLP systems need?

Understand & Analyse (NLU)

Classify

What type of text is it?

Find Similarity

Which texts are related?

Extract

What information is present?

Recognise

Who/what is mentioned?

Detect Intent

What does the user want?

Analyse Sentiment

How is the user expressing themselves?

Generate & Transform (NLG)

Answer Questions

Provide direct answers

Correct

Fix spelling & grammar

Generate Text

Create original content

Simplify

Make easier to understand

Summarise

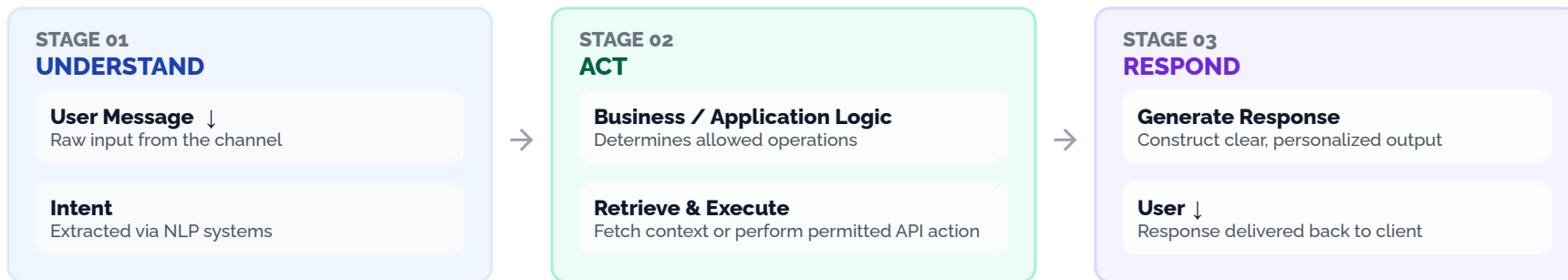
Shorten information

Translate

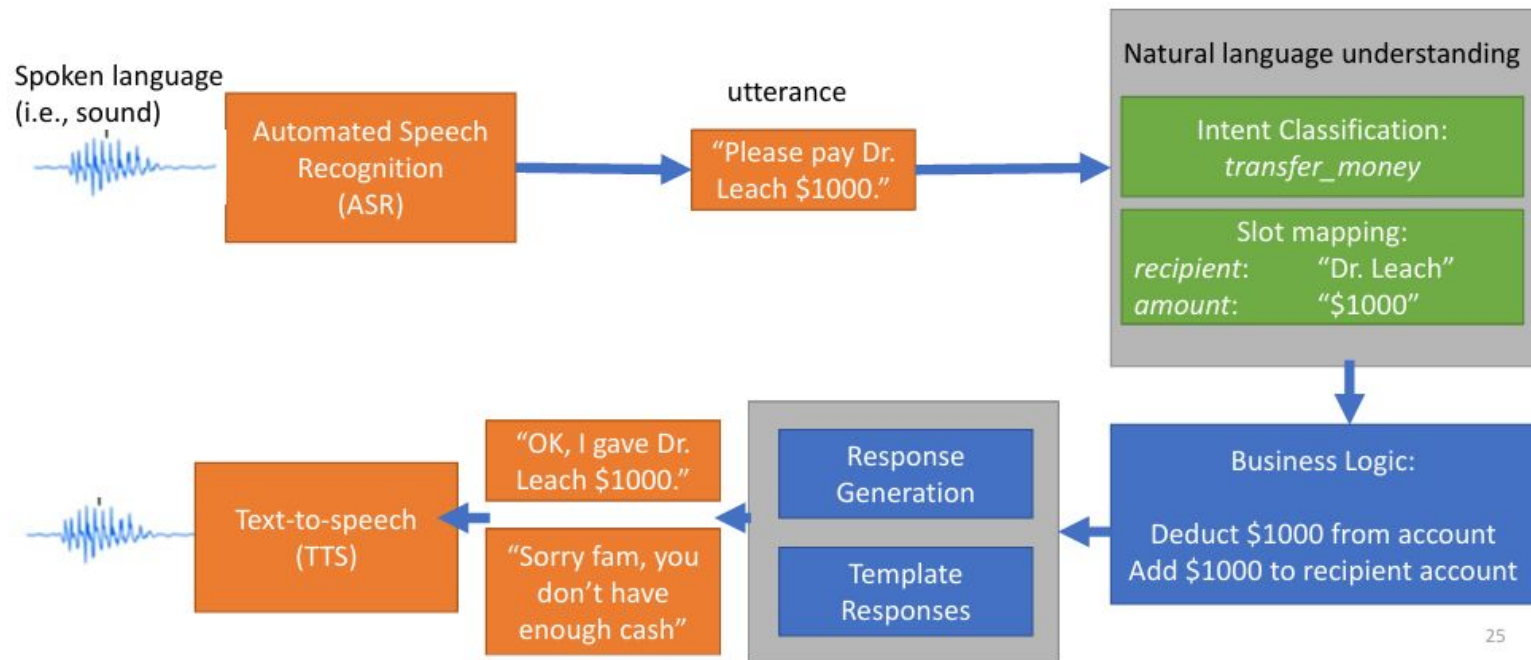
Convert one language to another

Conversational Artificial Intelligence

Conversational AI enables computers to interact with people meaningfully using natural language



Conversational AI Example Workflow



Large Language Models

01

PRE-TRAINED

Use the model as-is without any modifications. Rely entirely on built-in knowledge.

02

PROMPT ENGINEERING

Give better, structured instructions to guide the model's generation process.

03

IN-CONTEXT LEARNING

Provide explicit input-output examples directly inside the query context.

04

RAG

Inject verified, real-time external knowledge dynamically into the prompt.

05

FINE-TUNING

Adapt the base model parameters directly with custom, task-specific datasets.

Build or Reuse?

USE

Ready-made capability

- APIs
- Models
- Tools
- Datasets

ADAPT

Make it fit your problem

- Prompting
- RAG
- Fine-tuning
- Custom data

INTEGRATE

Combine existing components

- Models
- APIs
- Retrieval
- Application logic

BUILD

Create what is missing

- Custom components
- Datasets
- Unique functionality

Design for the Resources You Have

WHAT MAY BE LIMITED?

Data

Scarce language data

Models

No pre-trained models for problem domain

Evaluation

Lack of benchmarks for target language

Context

Missing domain information

Design for the Resources You Have



Reuse multilingual models



Collect targeted data



Use RAG where appropriate



Adapt existing models



Keep the prototype focused



Validate with intended users

Build Responsible AI

LANGUAGE

- Bias
- Representation
- Cultural context

OUTPUT

- Hallucinations
- Harmful or incorrect content

IMPACT

- Consequences when the system gets it wrong

How Do You Choose the Right NLP Technology?

Is the system understanding text? → Classification, Intent detection, Extraction

Is it generating or transforming text? → LLM, Text Generation, Summarisation

Is it converting between languages? → Machine Translation

Does it need to find information? → Information Retrieval, RAG

Does it need to interact with users? → Conversational AI, Dialogue Systems

Does it need to work with a specific language or domain? → Multilingual models, Fine-tuning, Custom data

Human Language Technology Applications



01

Dialogue Systems



02

Conversational
Agents



03

Machine
Translation Tool



04

Writing Assistants



05

Text Summarisation
Tool



06

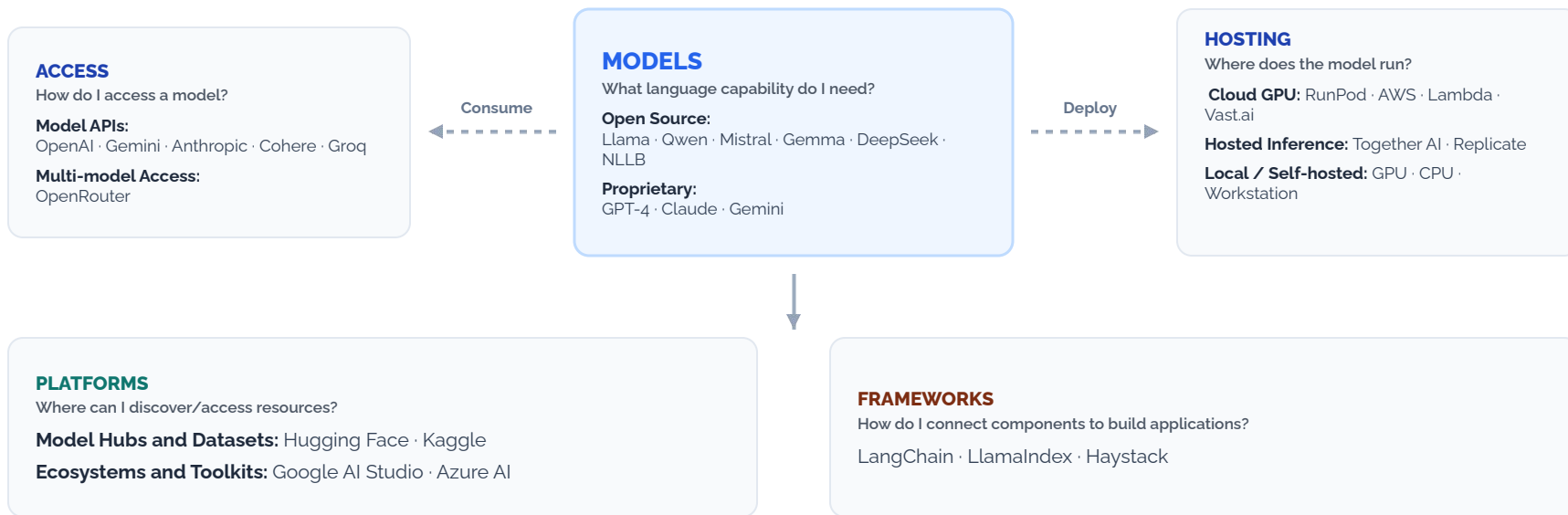
Question Answering
System



07

Information
Extraction tool

Platforms, Models and Frameworks



Put It Into Practice

01 - PROBLEM

What problem are you trying to solve?

02 - USER

Who are you designing for?

03 - APPLICATION

What are you proposing to build?

04 - LANGUAGE TASK

What does the system need to do with language?

05 - TECHNOLOGY

What could you use to make it work?

06 - PROTOTYPE

What can you realistically demonstrate?

Use your current idea

Thank You



Questions or Contributions?