

# **AI INBOUND CALLING AGENT .**

Project Review

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# Project Overview

## AI Inbound Calling Agent

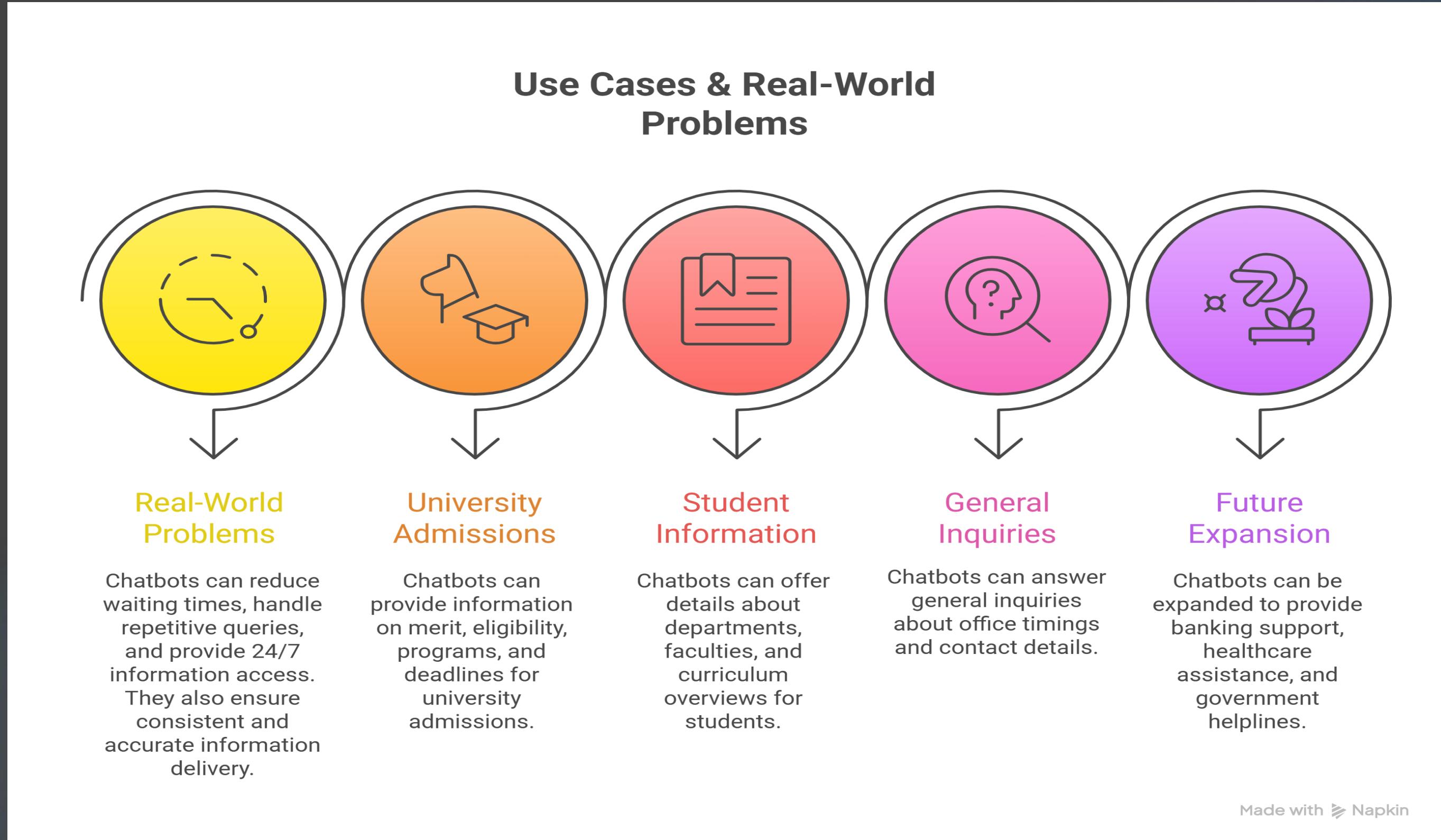
**Our project focuses on building an AI-powered inbound calling agent that can automatically answer phone calls, understand user queries, and respond in a natural human-like voice. The system is designed to handle high volumes of calls efficiently while providing accurate, context-aware information.**

**Initially developed for the University of Sargodha (UOS), the system acts as an intelligent virtual receptionist capable of answering admission-related queries and other informational requests without human intervention.**

## Value Created

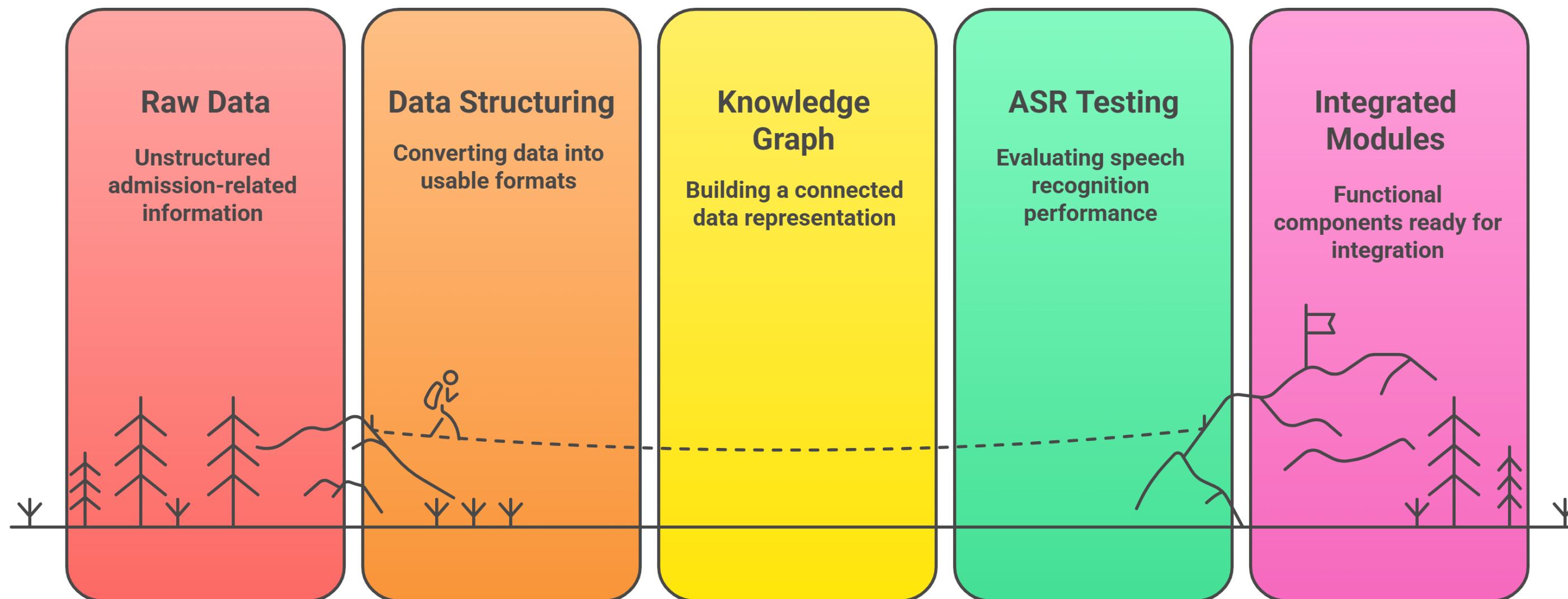
- Reduces workload on human call center staff
- Provides 24/7 availability
- Delivers fast, consistent, and accurate responses
- Improves user experience through natural voice interaction
- Scalable for multiple domains (education, banking, healthcare)

# USE-CASES and Real-World Problems

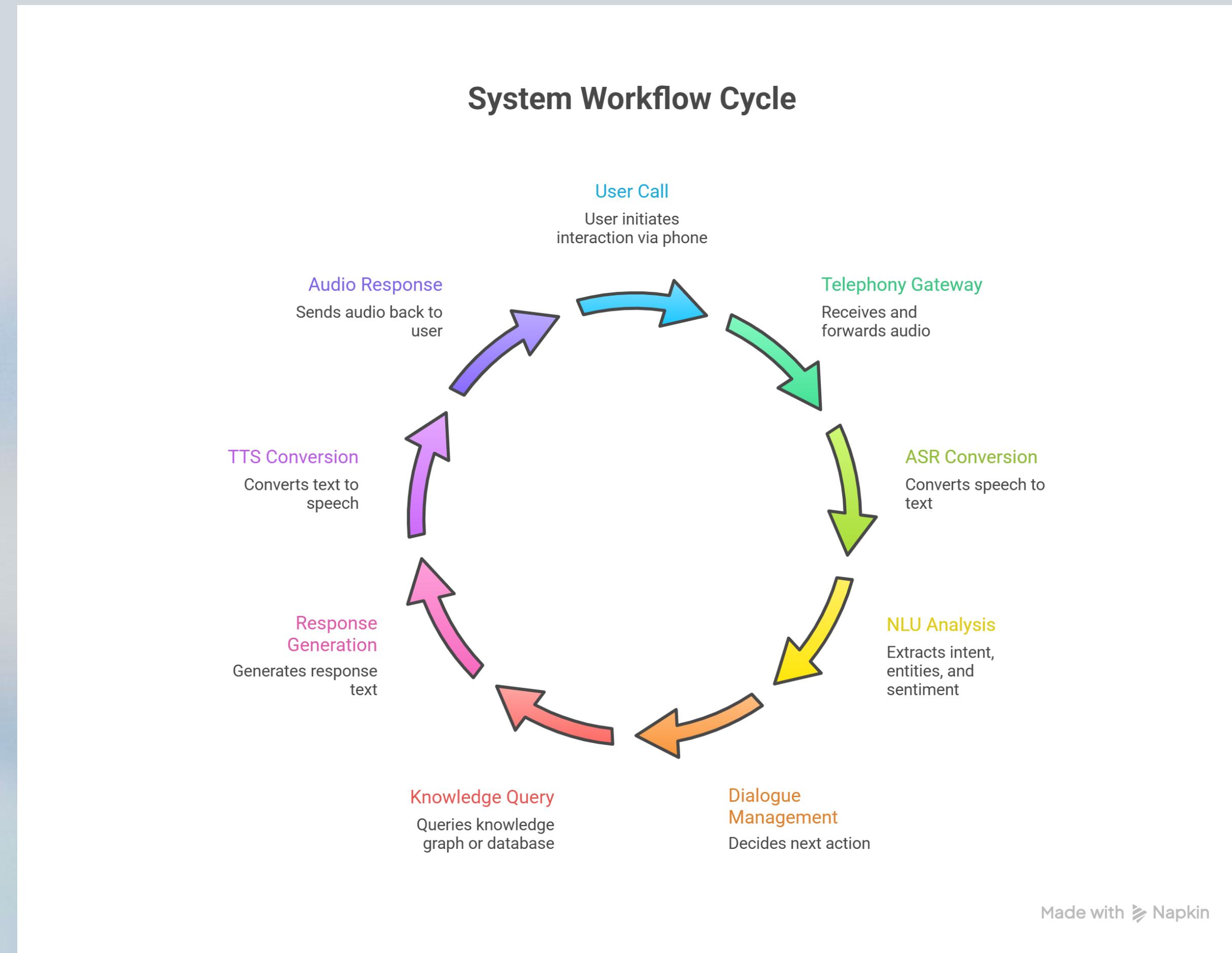


# Progress Till Now

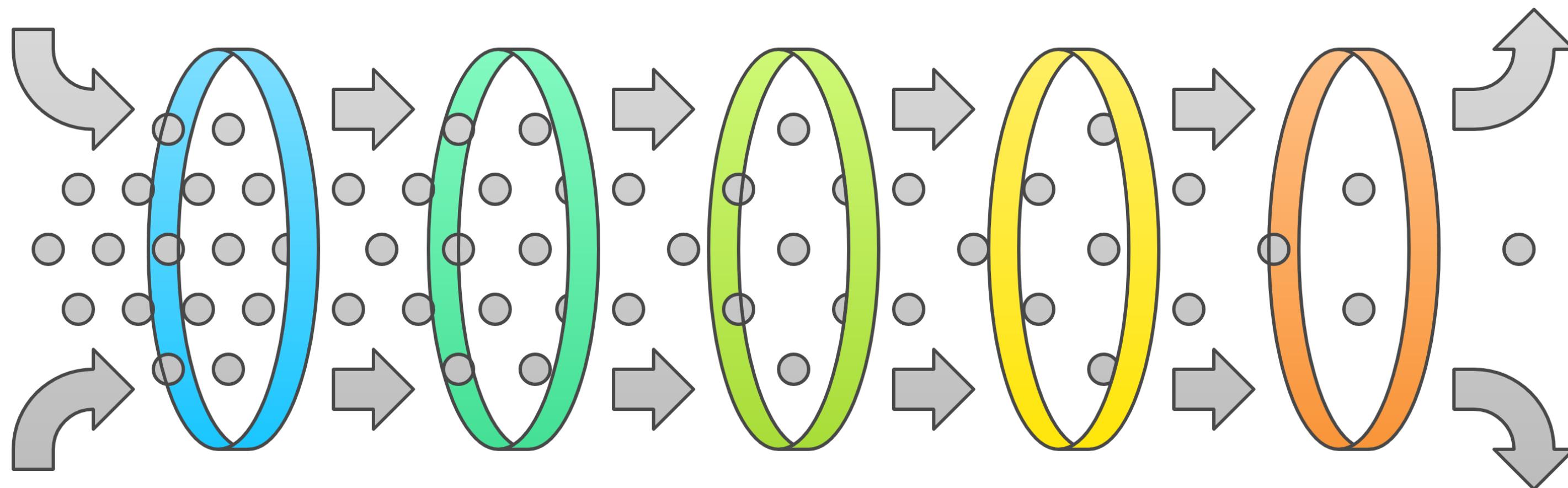
## Project Progress



# Overall Workflow of the System



# ASR MODULE



## Speech Conversion

Converts audio to text

## Noise Handling

Reduces background noise

## Accent Variation

Adapts to different accents

## Model Utilization

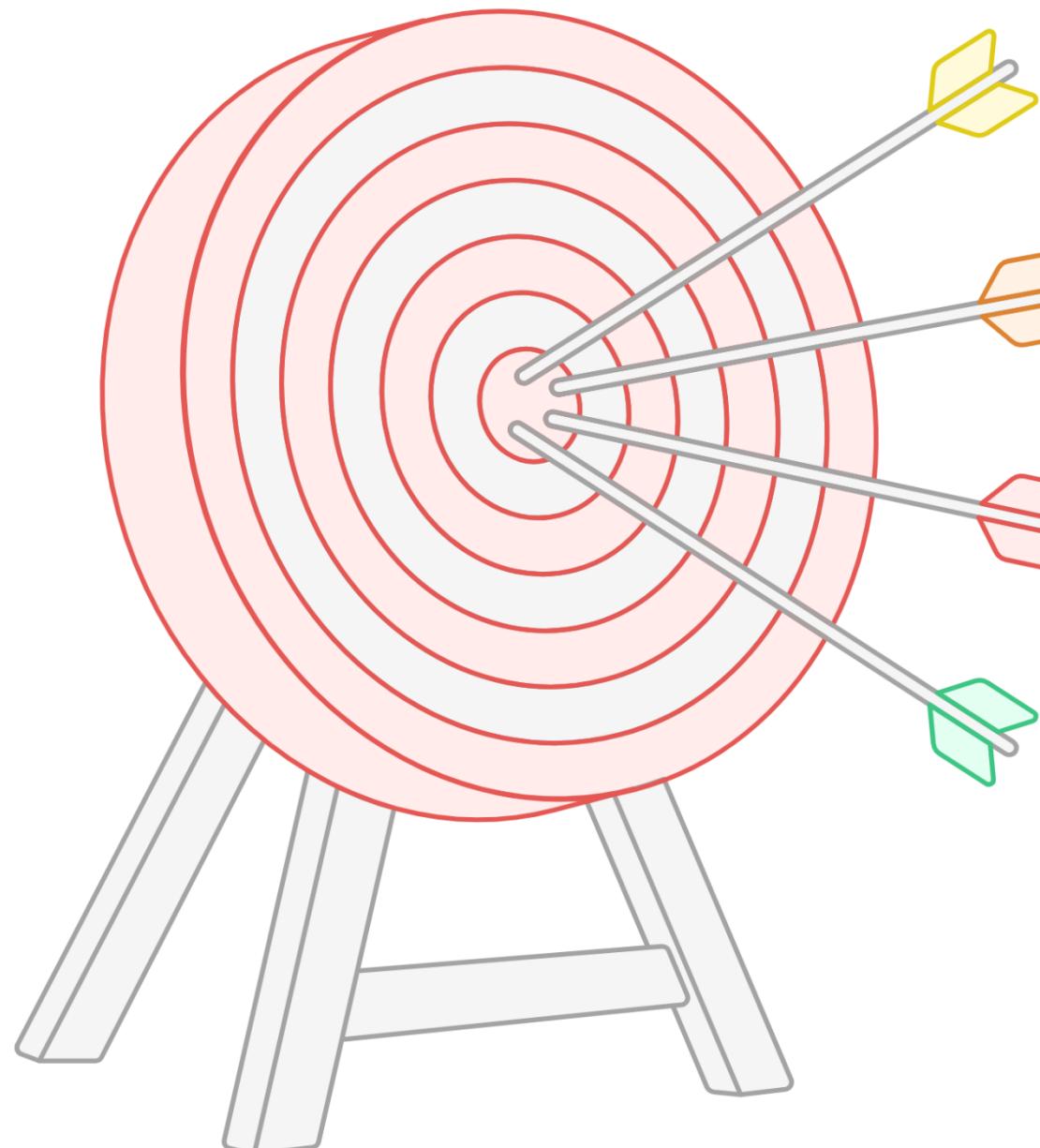
Uses pretrained ASR models

## Real-Time Streaming

Streams audio for low latency

# NLU Module

## NLU Module Functionality



### User Intent

Core reason for interaction



### Entities Extraction

Identifies key information from text



### Complexity Detection

Flags complex queries for escalation

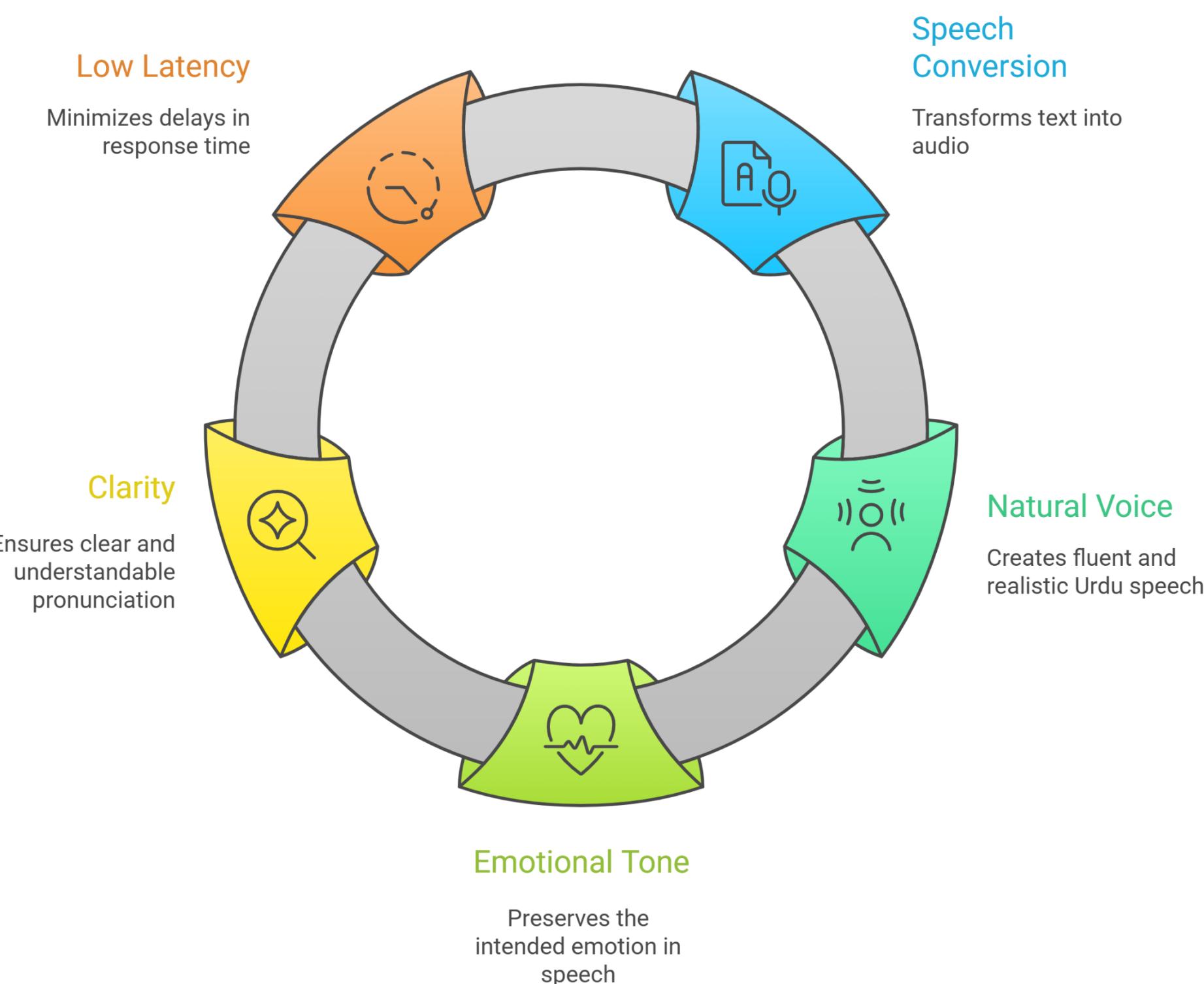


### Text Analysis

Initial processing of transcribed text

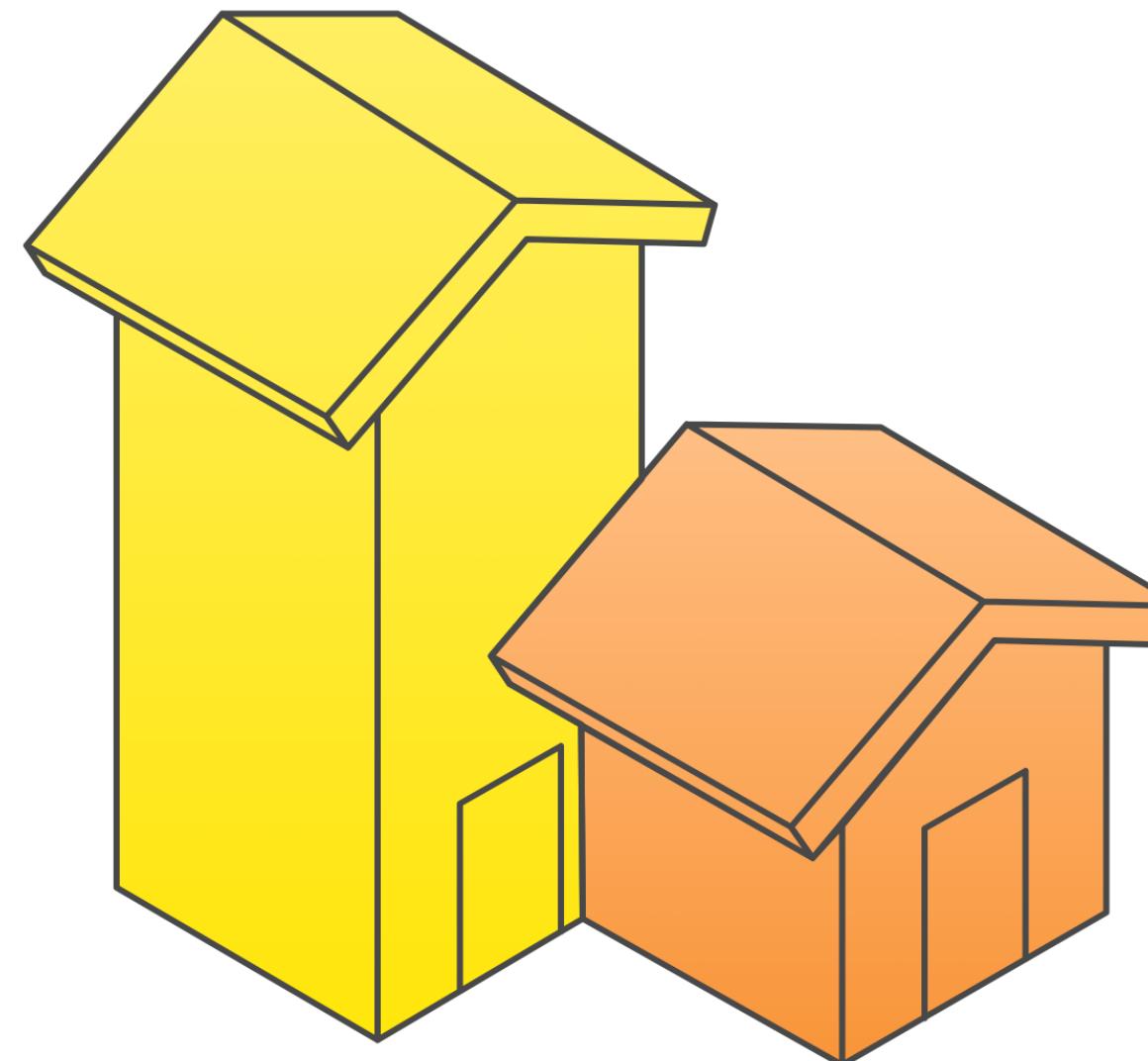
# TTS Module

## TTS Module Overview



# KG and Reasoning Module

## Knowledge Graph and Reasoning Module



1

### KG Working

Stores structured university data and represents relationships between entities using a graph structure. This enables accurate and consistent answers.

2

### GraphRAG Reasoning

Retrieves relevant graph context and supplies verified facts to the language model. This prevents hallucination and ensures trustworthiness.

# Currently Working On

## Ongoing Development

- **Expanding Knowledge Graph using real-world + synthetic data**
- **Refining KG schema and relationships**
- **Integrating ASR, NLU, KG, and TTS modules**
- **Building admin dashboards for data updates**
- **Developing a web application for query testing and monitoring**

## Planned Enhancements

- **Full Deployment with Telephony Gateways**
- **Multi-Language Support ( Regional Languages )**
- **Advanced Emotion Detection**
- **Voice Biometrics for authentication**
- **Expansion to other domains (banking, healthcare)**
- **Continuous learning from call logs and feedback**

**The Goal is to transform the system into a production-ready conversational AI Platform.**