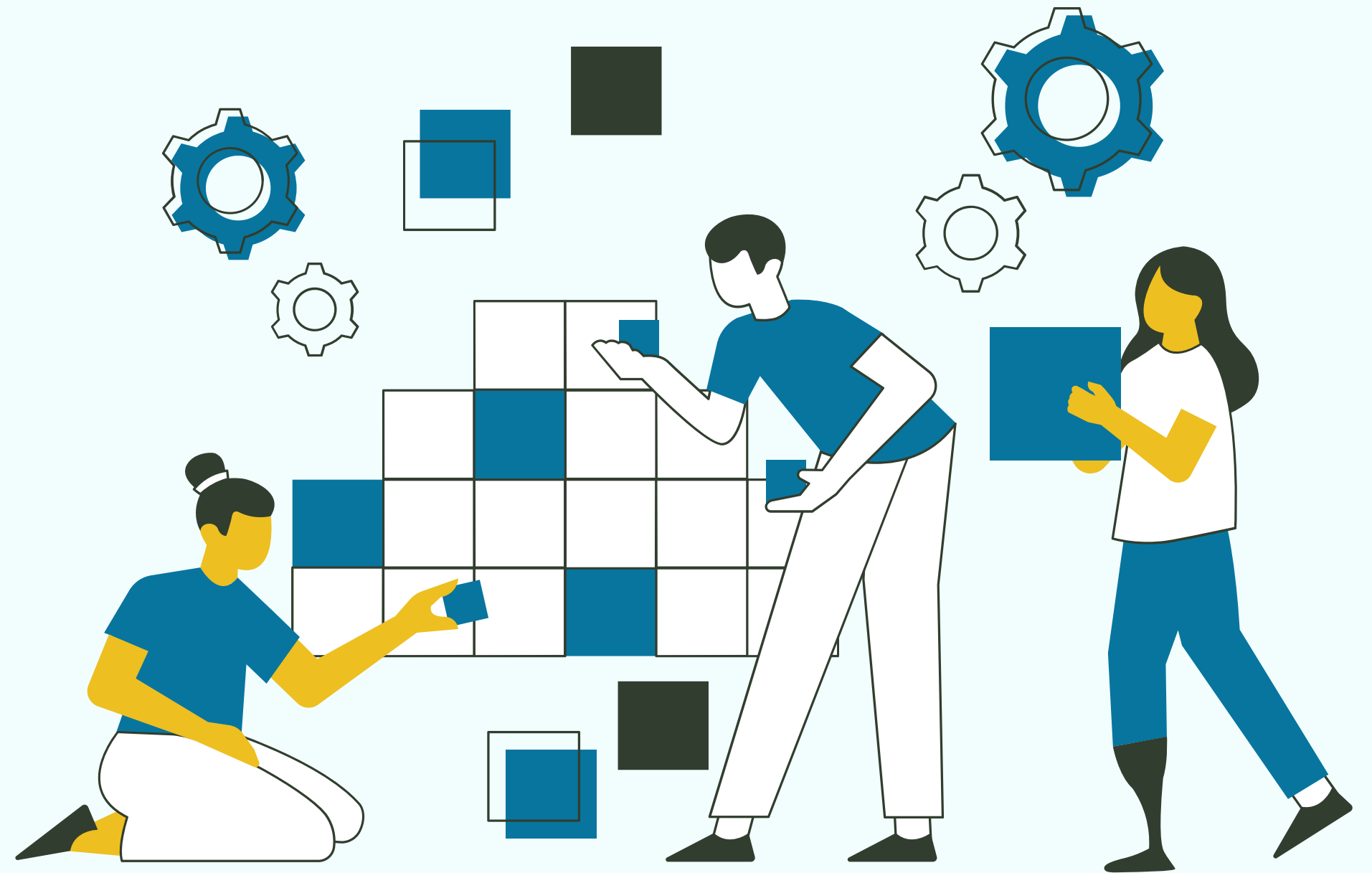


DEVTrails

University Hackathon 2025

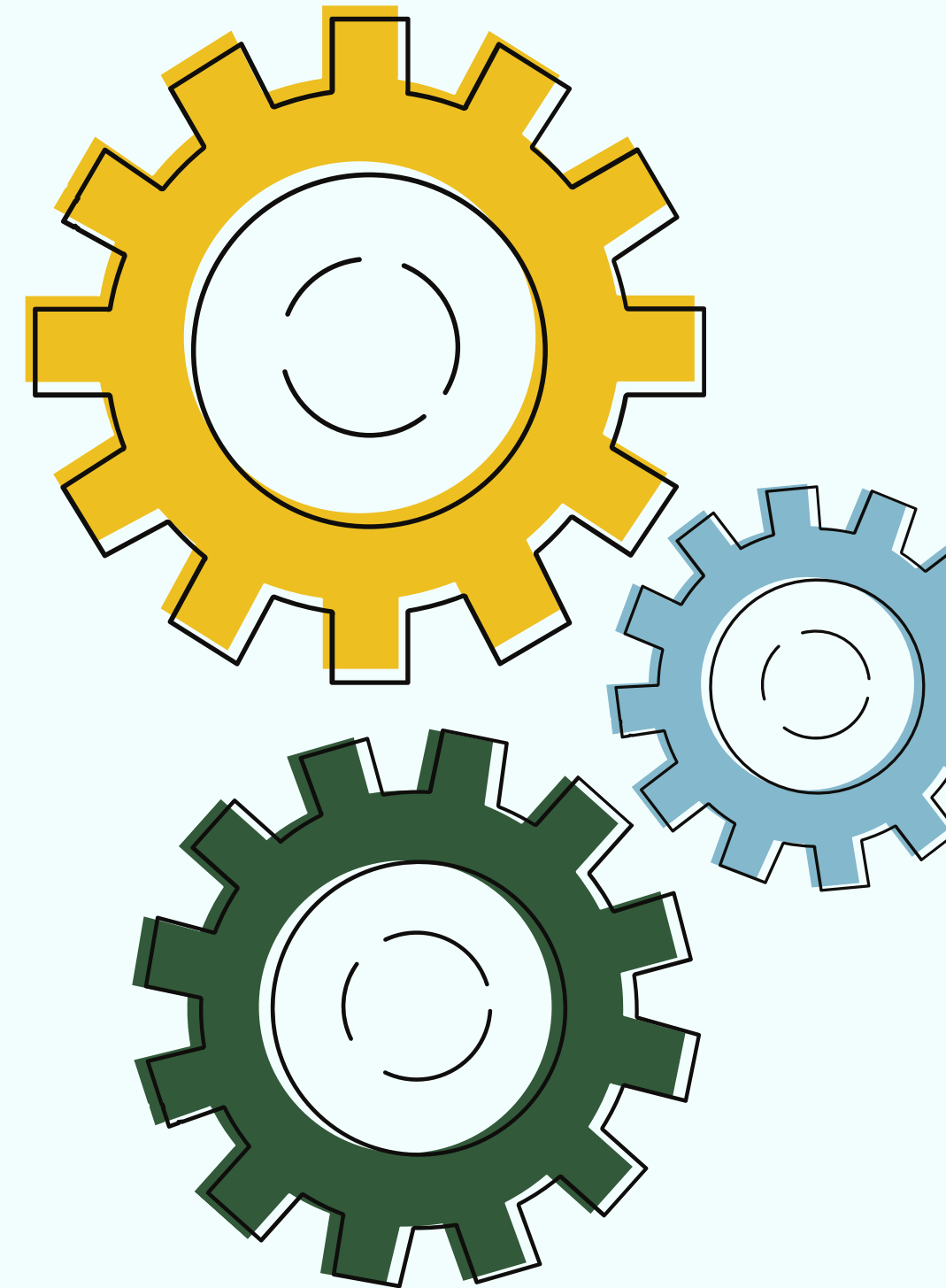


TEAM ClusterBusters

Amrita Vishwa Vidyapeetham, Coimbatore

Members

- C S Amritha
- Anaswara Suresh M K
- Avi Nair
- Adithya N S
- R. Sruthi

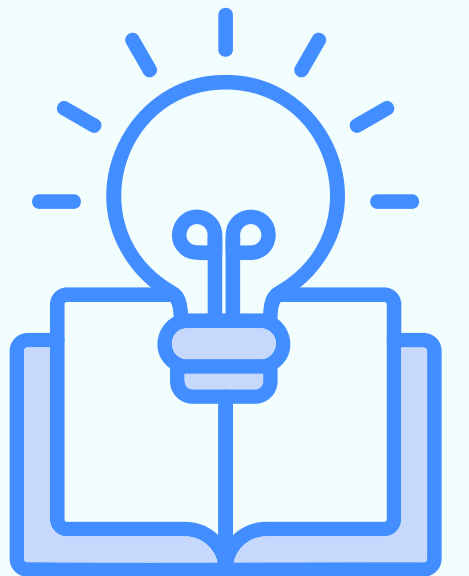


Techstack



Categorized Overview

- Dataset Generation
- Model Training
- Live Capture
- UI/Dashboard
- LLM Integration





Dataset Generation

Tools & Concepts Used:

- Kind (Kubernetes-in-Docker) - Lightweight, reproducible local clusters
- Prometheus - Monitoring and metrics scraping
- LitmusChaos - Injected real-world failure scenarios

Alternatives considered but not chosen:

- Minikube: Slower startup, less headless
- Locust (removed): Not suited for chaos injection

WHY IT'S UNIQUE:
THIS CUSTOM DATASET WAS GENERATED SPECIFICALLY FOR OUR USE CASE, ENSURING HIGH RELEVANCE AND ACCURACY FOR TRAINING OUR MODEL.





Model Training

Classification (Neural Networks) (CHOSEN)

- Pros: Good for clear failure labels.
- Cons: Needs labeled datasets, risk of imbalance.

Random forest (CHOSEN)

- Pros: robust to overfitting
- Cons: Less interpretable

Time-Series Forecasting (DISCARDED)

- Pros: Captures trends over time (e.g., LSTM, ARIMA).
- Cons: Needs well-structured temporal data.





Live Capture

Technologies Used:

- Prometheus: Real-time metric scraping
- MongoDB: Stores alert data for UI + LLM access

Why this works:

- Prometheus has built-in exporters for easy monitoring.
- MongoDB (NoSQL) is flexible, scalable, and faster for querying alert data compared to PostgreSQL (relational), which would require rigid schema design.





UI / Dashboard

Built With:

- React + Vite + TypeScript
- Tailwind CSS for styling
- shadcn-ui for polished UI components

Why this stack:

- Fast dev & hot reload (Vite)
- Type safety (TS)
- Clean, minimal UI using shadcn



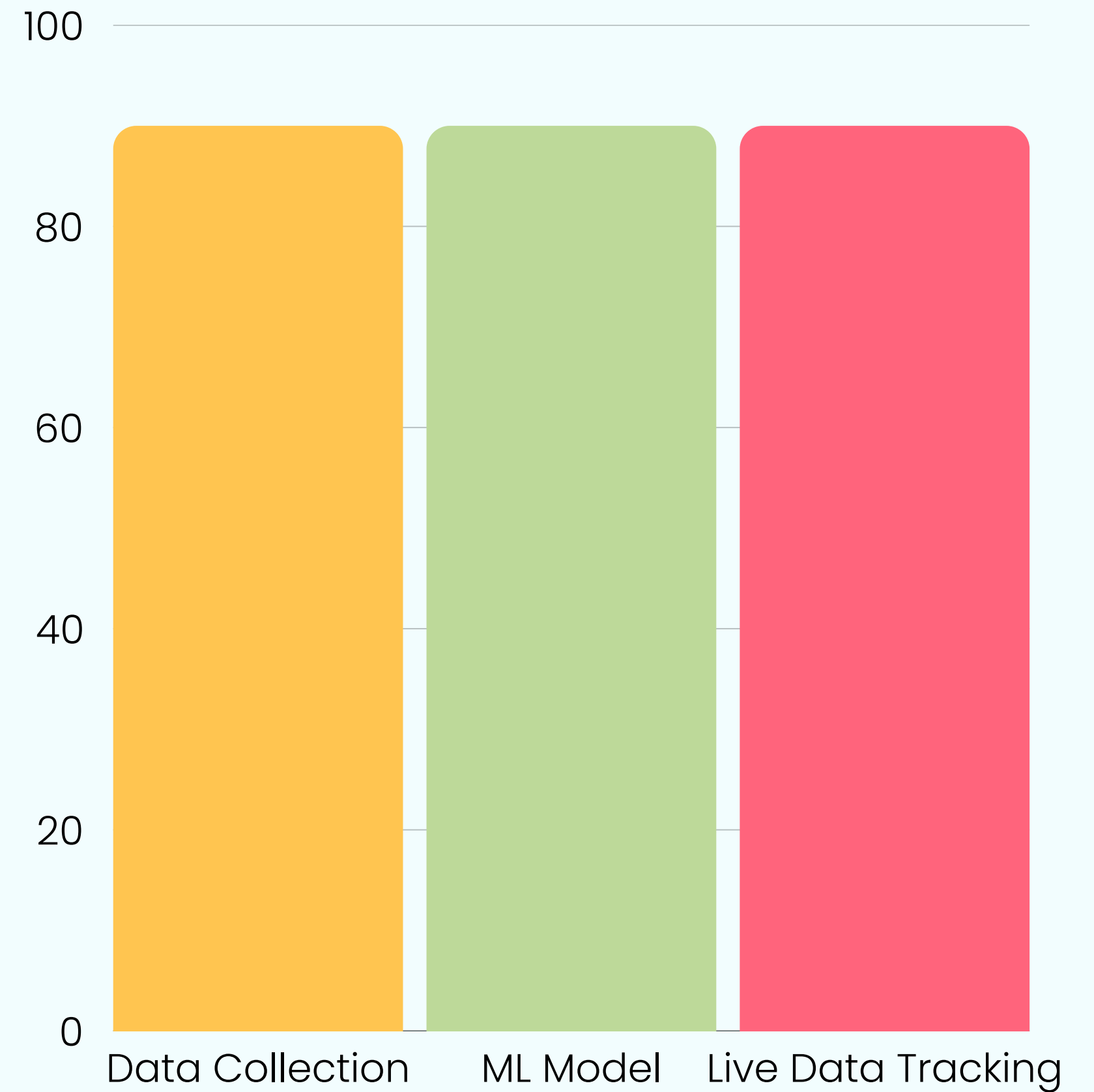


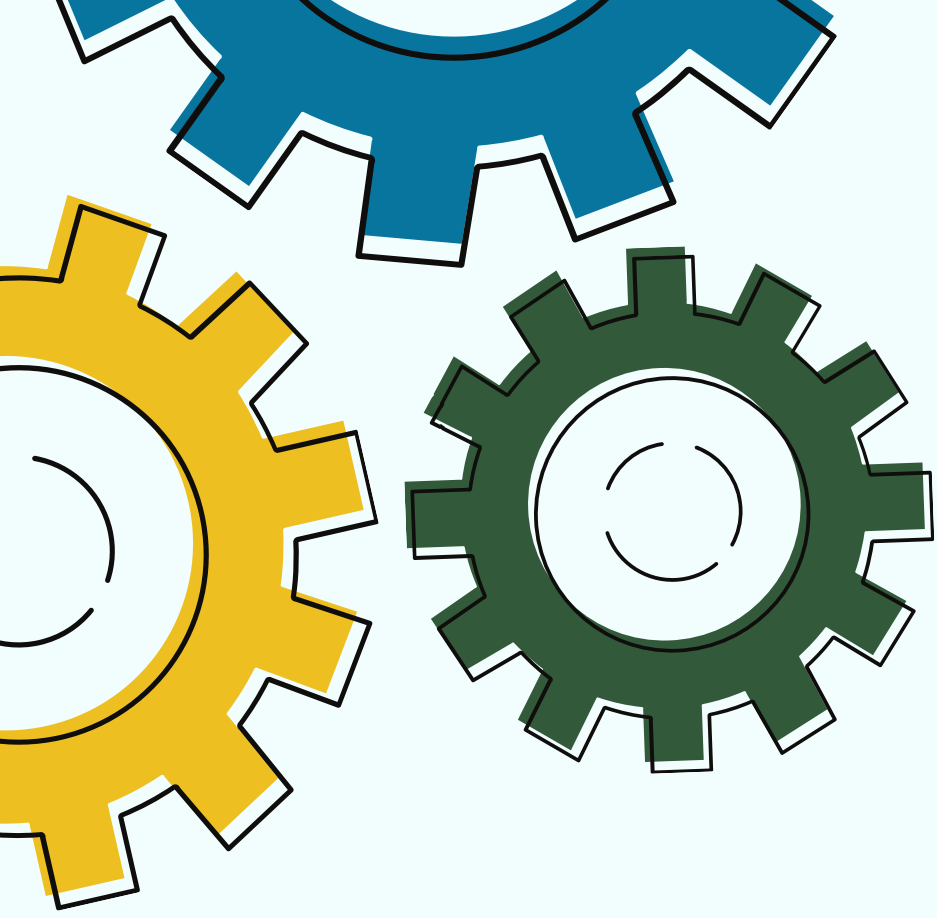
LLM Integration

- System explanation using GenAI
- Tech Stack:
 - google.generativeai (Gemini)
 - FastAPI, CORS middleware
 - MongoDB (LLM context store)
 - dotenv for secrets
 - Pydantic, Pathlib, HTTPException, Routers
- Why this setup:
 - Lightweight and composable
 - Modular endpoints
 - Scales well with new prompt routes



Current Status





Thank You!

