PARSHWANATH CHARITABLE TRUST'S
A.P. SHAH INSTITUTE OF TECHNOLOGY
Department of Computer Science and Engineering
Data Science

MAJOR PROJECT 1
(Topic selection)

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Yash Baviskar (22107021)
Mohini Deore (22107065)
Akshata Khandekar (22107034)
Tejas Patil (22107024)

Computer Science and Engineering
(Data Science)

Automated Orchestration Framework for SRE and System Administration (AOSS)

Objectives:

Evaluate the system on realistic SRE scenarios, benchmarking against baselines, **and produce research publications on Agentic RAG design and retrieval methods.**

- Build a **modular multi-agent orchestration system** to automate SRE tasks from natural-language commands, **with inter-agent communication and error correction.**
- Integrate a **RAG layer combining semantic vector search and graph-based linking** to ensure context-aware, policy-compliant, cross-document reasoning.
- Develop monitoring and reporting features with **real-time logging, Grafana dashboards,** and structured audit reports for transparent, reliable operations.

Outcomes :

A working multi-agent orchestration framework that automates complex SRE and system administration tasks from natural-language inputs.

A RAG-powered retrieval system enabling agents to ground decisions in cross-document organizational knowledge and compliance rules.

Real-time observability via Grafana dashboards and detailed reporting of all configuration changes and agent actions for auditability.

Benchmarked evaluation of the system on realistic SRE scenarios, with metrics on success rate, error correction, and deployment speed.

Research contributions in the form of publishable papers on Agentic RAG architectures and cross-document retrieval methods tailored for SRE tasks.

Adaptive Project-Driven Learning (APDL) Platform with AI-Powered Skill Sequencing

Objectives :

To create an AI-driven roadmap generator that decomposes project specs into skill-based milestones with dynamic sequencing.

To develop a real-time knowledge aggregator that curates/creates learning content from docs, APIs, and tutorials for niche tech stacks.

To build a feedback-powered adaptation engine that adjusts roadmaps based on user progress and skill gaps.

To democratize project-based upskilling for non-traditional learners and underrepresented groups in tech

Outcomes :

Faster onboarding than static platforms (eg Coursea) and accuracy in project decomposition

Proprietary adaptation engine with Skill gap detection, feedback and adaptive interventions

Analyszing user satisfaction with generated tutorials and Support for niche stacks (Ruby on Rails, Elixir, SvelteKit).

cost reduction than bootcamps for equivalent skills and 2x faster skill acquisition for neurodiverse learner

Contextual Video Intelligence Platform

Objectives:

To develop real-time multimodal sentiment analysis integrating audio tone, visual emotion, and textual captions to guide editing decisions.

To build an intent-aware recommendation engine suggesting edits (cuts, B-roll, effects) based on content context.

To create an accessible editor interface with AI-assisted tools for non-professionals.

To establish ethical content guardrails preventing harmful manipulation.

Outcomes :

Real-Time Sentiment Analysis with emotion-tagging

Intent-Aware Recommendations analyzing user adoption to AI suggestions

Provide Accessible Interface and low video production to democratize media creation

synthetic media detection in user uploads to see ethical guidelines

Only describe about revlevent sdgs among listed below with your project topic

Society

Economy

Environment

SDG Description for AOSS

- **SDG 8: Decent Work and Economic Growth**

Our system aims to reduce manual toil and repetitive error-prone tasks in SRE and system administration by automating them intelligently and safely. This improves operational efficiency and frees skilled workers to focus on higher-value tasks, supporting productive, decent work in the IT sector.

- **SDG 9: Industry, Innovation, and Infrastructure**

AOSS promotes innovative use of AI (agentic, RAG-enabled orchestration) to improve the reliability, maintainability, and scalability of digital infrastructure. By simplifying and automating complex DevOps workflows, it contributes to building resilient, modern infrastructure in diverse sectors.

- **SDG 11: Sustainable Cities and Communities**

Reliable IT infrastructure is essential for smart cities and modern public services. AOSS can help institutions (e.g., colleges, municipal bodies) manage their IT systems with greater transparency, lower error rates, and better monitoring, supporting safer, more resilient communities.

SDG Description for topic 2

SDG: 4 (Quality Education)

Personalized Upskilling: Tailors learning to individual gaps (e.g., teaches Python decorators *only* if needed for a Flask project).

Inclusive Design: Supports dyslexic/ESL users via multimodal content (video/text/audio).

SDG 8 (Decent Work):

- Directly builds job-ready skills (e.g., "Implement JWT auth in Node.js" → micro-credential).
- Tracks employability metrics (e.g., project complexity ≈ salary benchmarks).

SDG 9 (Industry, Innovation):

- Patentable "Skill Gap Inference Algorithm" using project decomposition trees.

SDG 10 (Reduced Inequalities):

- Free tier for low-income regions + offline mode (SDG 4 crossover).

SDG Description for topic 3

SDG: 9 (Industry, Innovation)

Creative Democratization: Reduces video production barriers for NGOs/educators (e.g., auto-generating climate awareness videos from raw footage).

Infrastructure Novelty: First framework linking *multimodal sentiment → editing actions* (patent potential).

SDG 4 (Quality Education):

- Auto-summarizing lecture videos with emotion-highlighted reels (e.g., "Show 3 impactful moments where professor expressed urgency").

SDG 8 (Economic Growth):

- 50% faster content creation for small businesses/social enterprises.

SDG 10 (Reduced Inequalities):

- One-click "Accessibility Mode" adding sign language overlays/audio descriptions.

Thank You