

Document 3: Automated Engineering Workflow Manager (AEWM)

1. Project Title

AEWM – AI-Powered Workflow Automation for Engineering Projects

2. Problem Statement

Engineering teams spend excessive time on workflow coordination:

- Assigning tasks
- Tracking progress
- Updating project documentation
- Communicating updates across teams

Challenges:

- Manual task tracking
- Miscommunication between teams
- Lack of AI assistance in workflow automation

3. Proposed Solution

Implement an AI multi-agent workflow manager that:

- Assigns tasks based on skill & availability
- Tracks project milestones automatically
- Generates status and risk reports
- Integrates with existing project tools (Jira, SAP)

4. Project Objective

- Reduce manual project management effort

- Increase project delivery efficiency
- Provide actionable project insights
- Enable AI-assisted decision-making

5. System Architecture

- **Frontend:** React dashboard with project visualization
- **AI Layer:** Multi-agent system for task allocation & prioritization
- **Backend:** Python, FastAPI, PostgreSQL for project data
- **Integration:** Jira, SAP, Email notifications

6. Technology Stack

- React + Tailwind for UI
- Python + LangChain for AI orchestration
- Vector DB (FAISS) for document & SOP retrieval
- FastAPI for backend services

7. Dataset Details

- Historical project timelines
- Task allocation logs
- Technical documents and SOPs
- Communication logs

8. Features

- AI-driven task assignment
- Automated status reporting
- Risk & delay prediction

- SOP-based task recommendations

9. Sample Use Cases

User	Use Case
Project Manager	Auto-assign new tasks to engineers
Engineer	Receive AI-recommended SOP for task execution
Supervisor	Track project milestones in real-time

10. Metrics of Success

- Task allocation time reduction $\geq 60\%$
- On-time milestone achievement $\geq 90\%$
- Reduction in workflow-related errors $\geq 50\%$

11. Future Enhancements

- Voice-based AI project assistant
- Predictive workload balancing
- Integration with IoT-enabled project tracking

12. Why This Project is Valuable to John Cockerill

- Supports smart engineering execution
- Aligns with Industry 4.0 automation
- Reduces time-to-completion of industrial projects

13. Conclusion

AEWM revolutionizes engineering workflow, leveraging AI for automation, insight generation, and project optimization.

14. Author

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Specialization: AI, Full Stack, Workflow Automation