

# Automated API Documentation Generator Using GenAI Capstone Project

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# Agenda

- Overview / Use Case Identification
- Proposed Solution
- Value Proposition
- Risk and Challenges
- Oversight and Compliance



AGENDA POINT

# Overview / Use Case Identification



# Overview

## Background:

API documentation is essential for developers but often requires extensive manual effort, leading to delays, human errors, inconsistencies, and missing on-time delivery. Existing documentation solutions typically lack real-time integration with development pipelines, resulting in outdated content. Generative AI can streamline this process by automating documentation creation, ensuring accuracy, consistency, timely updates and meeting on-time delivery timeline.

## BENEFIT OF APPLYING GENAI:

Generative AI ensures comprehensive, up-to-date, and user-friendly API documentation. This approach reduces time-to-market for products, minimizes human error, and enhances the developer experience by delivering standardized and readability content.



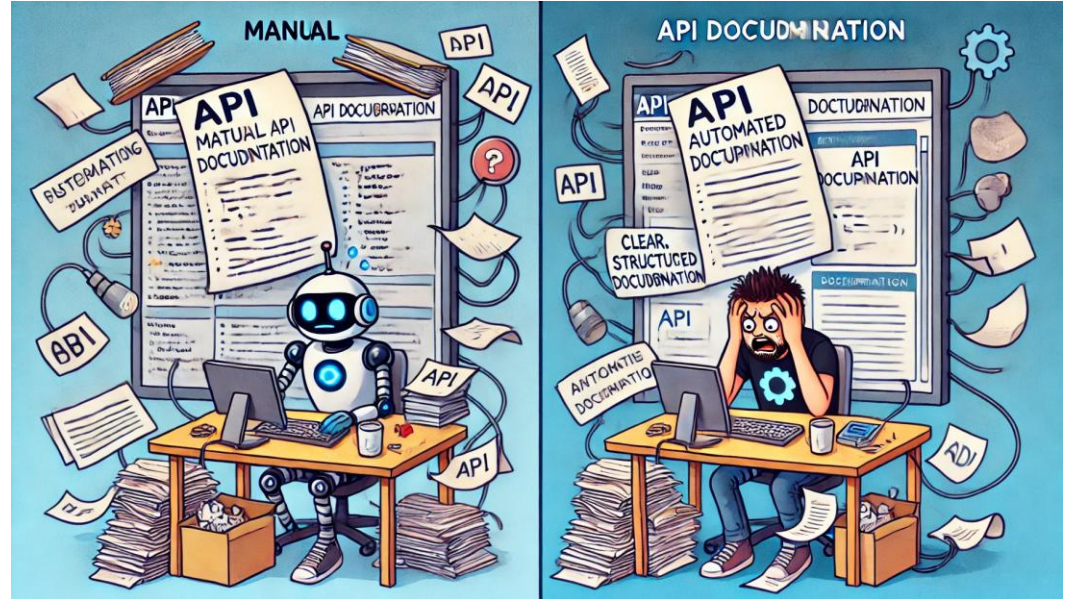
# Use Case Identification

USE CASE: Automate the generation and maintenance of API documentation.

## BACKGROUND:

- Manual effort leads to delays, errors, inconsistencies
- Lack of real-time integration with development pipelines
- Need for automated documentation creation

Image generated using ChatGPT



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# Proposed Solution



## Idea 1: Automated Real-Time Documentation Generation

**Implementation:** Use Generative AI to automatically generate API documentation from code repositories. For example, Swagger, OpenAPI specifications and integrate within continuous integration, continuous deployment or continuous delivery (CI/CD) pipelines.

**Benefit:**

- Saves developer time
- Ensures real-time updates
- Reduces manual intervention

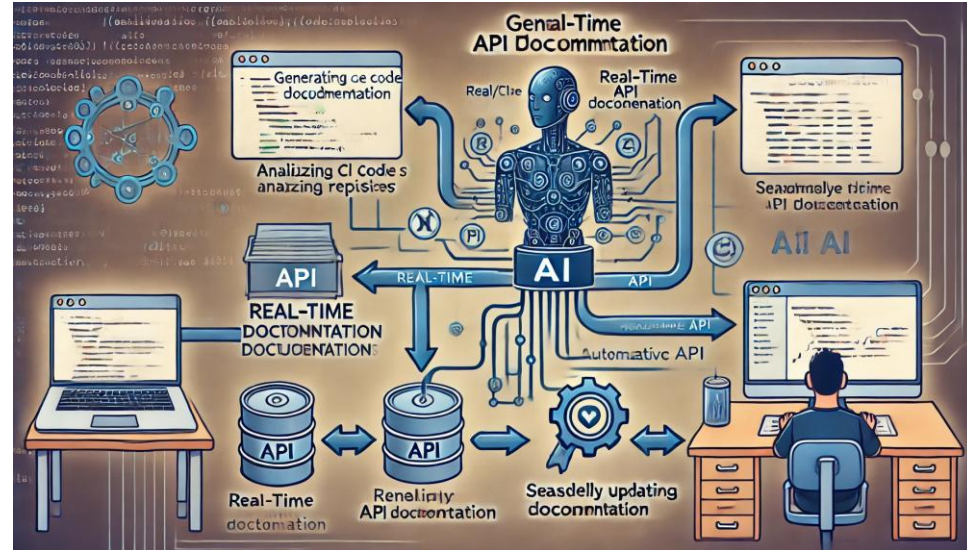


Image generated using ChatGPT



## Idea 2: Context-Aware Endpoint Descriptions

**Implementation:** Leverage Natural Language Processing (NLP) to generate clear, user-friendly descriptions of API endpoints, parameters, and responses.

**Benefit:**

- **Improves Readability:** Ensures that the documentation is well-organized, concise, and free of unnecessary complexity, making it easier to read and understand.
- **Understanding for Diverse Developer Audiences:** The content is tailored to accommodate developers with varying levels of experience, from beginners to experts, and from different technical backgrounds. For example, front-end, back-end, full-stack, and DevOps.





## Idea 3: Customizable Multi-Language Support

**Implementation:** Enable multi-language documentation generation with customizable templates.

**Benefit:**

- Ensures that developers from different countries, time zones, and backgrounds can access and use the documentation or tool without barriers.
- May include multilingual support, clear explanations, and compatibility with different devices.
- Uses simple and unambiguous language to accommodate non-native English speakers.
- Improves the overall user experience (UX) by making the documentation or software intuitive, well-organized, and easy to navigate.
- Uses consistent formatting, interactive examples, code snippets, and visual aids to help developers quickly find and apply information.



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# Value Proposition



# Why Use Generative AI for API Documentation?

- **Accurate and Up-to-Date:** Automatically syncs with code changes, ensuring real-time updates.
- **Faster Time-to-Market:** Eliminates manual documentation bottlenecks, speeding up API releases.
- **Reduced Errors & Consistency:** Standardized formatting minimizes human mistakes and ensures clarity.
- **Improved Developer Experience:** Clear, user-friendly docs enhance API adoption and onboarding.
- **Customizable and Multi-Language Support:** Adapts to different formats, branding, and global audiences.
- **Security & Compliance:** Ensures secure access, version control, and regulatory adherence.



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# Risk and Challenges



# Risks and Challenges

- **AI misinterpretation of code**  
Solution: Human-in-the-loop validation
- **Security vulnerabilities**  
Solution: Encrypted data transmission, secured repository access.
- **Encrypted data transmission, secured repository access.**  
Solution: Optimize AI performance, load testing.
- **Scalability Issues**  
Solution: Optimize AI performance and conduct load testing.
- **Bias in Generated Content**  
Solution: Conduct audits to ensure unbiased content.



Image generated using ChatGPT



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# INTEGRATION PLAN



# Implement GenAI Integration Plans considering Risk Management Procedures

## **Prototype Development:**

- Build an initial Generative AI-powered documentation generator and test within controlled environments.

## **Deployment:**

- Deploy the system in live CI/CD pipelines.
- Risk Management: Conduct security audits and implement robust access control measures.

## **Monitoring and Maintenance:**

- Continuously monitor performance and accuracy.
- Risk Management: Implement feedback loops for developers and schedule periodic model retraining.



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# Oversight and Compliance





# Key Oversight Criteria

- Accuracy of Documentation: Regular reviews
- Data Privacy: PDPA-compliant data handling
- Developer Satisfaction: Feedback through surveys
- Security Monitoring: Intrusion detection, incident response planning



# Constraints and Parameters

## Technical Constraints:

- Seamless integration with existing CI/CD systems
- Efficient data processing during peak loads

## Regulatory Constraints:

- Adherence to software and data protection regulations.

## Ethical Constraints:

- Transparency about AI's role in documentation generation
- Preventing biased language through diverse dataset training



# Acknowledgments

## Inspiration & Research

- Based on industry best practices, Open API standards, and AI-driven documentation studies.

## Technologies Used

- Generative AI (GPT-based models)
- CI/CD tools (GitHub Actions, Jenkins)
- API frameworks (OpenAPI, Swagger)

## Contributors

- Developers and AI Specialists – For automation & NLP integration
- Technical Writers – For validation & refinement
- Compliance Teams – For ensuring security & accuracy

## Ethical and Compliance Considerations

- Adhered to data security and privacy standards (PDPA)
- Measures taken to minimize AI bias in documentation



# Thank you!