**Project Report**

***CI/CD Pipeline for Product Catalog API Service***

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**Tools Used :- Github Actions , Docker , SonarQube , Kubernetes , Maven .**

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1. ***Project Overview***

The **Product Catalog API** **Service** is a microservice developed using  **Spring Boot , MySQL**  and built with **Maven**. It provides a set of RESTful APIs to manage product information such as product name, description, price and categories.

To streamline the development process, improve release reliability, and automate build, testing, and deployment activities, a To streamline the development process, improve release reliability, and automate build, testing, and deployment activities, a **Continuous Integration and Continuous Deployment (CI/CD)** pipeline was implemented.

The CI/CD pipeline uses **GitHub Actions** for version control triggers, **Tekton Pipelines** running on **Kubernetes (Minikube)** to automate build, test, and deployment steps, **SonarQube** for code quality scanning, and **Docker** for containerization.

This setup ensures that every code change is automatically verified, built, tested, and deployed in a consistent and efficient manner inside the Kubernetes cluster.

1. **Goals of CI/CD**

The CI/CD pipeline was designed and implemented with the following goals:

* **Automate Build and Test**: Automatically compile and test the application on every code change to detect errors early.
* **Ensure Code Quality and Security**: Integrate static code analysis using SonarQube to maintain code standards and catch vulnerabilities.
* **Streamline Docker Image Creation**: Automate the building of Docker images for consistent deployments.
* **Enable Continuous Deployment**: Deploy the latest tested version of the application into a Kubernetes environment automatically.
* **Improve Developer Productivity**: Reduce manual efforts, accelerate release cycles, and increase confidence in deployments.