CSDO 1020 – DevOps CICD Pipeline Modernization Template

The purpose of this template is to provide you guidance for completing the DevOps CI/CD Pipeline Modernization group project. All your deliverables must be in the context of the provided Big Bang Case study. Feel free to add additional sections and support your document with visual and flow diagrams.

Part I - DevOps CI/CD Pipeline Modernization

Background
A summary of the company, its history, and its goals.

Assumptions
A list of the assumptions you made in relation to the provided cases study.

Improvement Opportunities
Identify the potential areas of opportunity for improvements or an existing problem that the company has that needs DevOps practices and CI/CD Pipeline; you could utilize the Value Stream Mapping (VSM).

Business and Technical Goals
A list of the tactical and strategic objectives associated with the DevOps Practices.

Performance Objectives
A list of relevant performance objectives related to the business and technical goals and requirements.

Priorities
Business and technical goals, business requirements, and performance objectives listed in order of priority.

Agile, DevOps, and Site Reliability Engineering (SRE)
This section must include a detailed description and explanation of Agile, DevOps, and SRE principles and practices for the company.

Expected Outcomes
A description of the anticipated outcomes of the adoption of the DevOps, SRE practices, and CI/CD pipeline that are to be built in support of the business case.

CI/CD pipeline Modernization Solution Overview
A high-level overview of the CI/CD pipeline solution is to be built-in in support of the business case requirements (business and technical) following cloud-native design principles for each phase.

Part II - DevOps CI/CD Pipeline Modernization

CI/CD Pipeline Design
This section must include a detailed description and explanation of the CI/CD pipeline design using open-source tools and following DevOps practices, SRE, and cloud-native design principles. Description and explanation of the different stages, tools, and services of the CI/CD pipeline for each phase. It can consist of and is not limited to the following:

- *Git as the Single Source of Truth*
- *Infrastructure as code management (e.g., immutable infrastructure, infrastructure code versioning)*
- *Configuration Management, resource configuration, and patch management*
- *Continuous Integration, Continuous Delivery, Continuous Deployment*
    - *Manage different environments (e.g., development, testing, staging, production, etc.)*
    - *Deployment strategies*

    - *Artifact repositories and versioning strategy*
    - *Test strategy and testing a new version of the software*
    - *Container orchestration*
- *Batch Processes*
- *Microservices and APIs*
- *Security*
    - *Container Security*
    - *keys and secrets management*
- *Monitoring & Observability*
    - *Deployment auditing and tracing*
    - *Infrastructure and Application logs and metrics management*

Note: *Feel free to include code snippets (Optional).*

Cloud Financial Management *(FinOps)*
This section must include a detailed description of the Kubernetes financial visibility and accountability in a hybrid/multi-cloud deployment.

Data Analytics *(DataOps)*
This section must include a detailed description of the data pipeline for delivering a data analytics solution.

Machine Learning *(MLOps)* **and Artificial Intelligence** *(AIOps)*
This section must include a high-level description of the ML pipeline (Considerations include Machine learning terminology (e.g., supervised, and unsupervised learning), Ingesting appropriate data, Retraining of machine learning models (e.g., Kubeflow), and Continuous evaluation), AIOps description and benefits.

Conclusion and Recommendations
This section highlights the DevOps practices, traditional and next-gen CI/CD pipeline adoption conclusion and recommendations.