

# GitOps HTML App with ArgoCD – Project Report

## ■ Introduction & Use Case

This project demonstrates the principles of GitOps by deploying a simple HTML application using Docker and ArgoCD on Kubernetes (via Minikube). The use case highlights how organizations can leverage Git as the single source of truth for Kubernetes deployments, ensuring automated, reliable, and consistent delivery pipelines.

## ■ Features

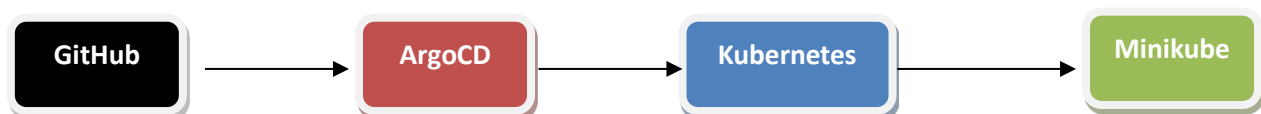
- ✓ Dockerized HTML application for easy container
- ✓ deployment Continuous Delivery with ArgoCD (GitOps approach)
- ✓ Kubernetes deployment using Minikube
- ✓ Demonstrates auto-sync and manual sync in GitOps

## ■ Architecture

The architecture follows a GitOps-driven pipeline:

1. Developer pushes application code & Kubernetes manifests to GitHub
2. ArgoCD monitors the repo for changes
3. On detecting updates, ArgoCD syncs the Kubernetes cluster
4. The application is deployed/updated in the Minikube cluster

## ■ Architecture Diagram



## ■ GitOps Workflow

- **Push** → Developer commits code/manifests to Git
- **Observe** → ArgoCD continuously monitors the repo
- **Sync** → ArgoCD auto-syncs or manually syncs changes
- **Deploy** → Kubernetes cluster updates the application automatically

## ■ Project Structure

gitops-argocd-demo

**manifests** # Kubernetes deployment YAMLS

**app** # HTML/Node.js source code

**Dockerfile** # Docker image build config

**README.md** # Documentation

## ■ Use Case / Why This Project Matters

- Simplifies Kubernetes deployments by using Git as the source of truth
- Enables Continuous Delivery without manual intervention
- Great learning project for DevOps beginners exploring ArgoCD & GitOps
- Helps teams adopt modern deployment practices with reliability

## ■ Key Learnings

- ✓ Hands-on experience with GitOps workflow
- ✓ Practical knowledge of ArgoCD deployment
- ✓ Learned how auto-sync & manual sync works
- ✓ Understood continuous delivery on Kubernetes

## ■ Troubleshooting

- ✗ App not updating after commit → **Ensure ArgoCD sync is enabled**
- ✗ Pod stuck in CrashLoopBackOff → **Check logs (kubectl logs )**
- ✗ ArgoCD UI not loading → **Verify port-forwarding (kubectl port-forward svc/argocd-server -n argocd 8080:443)**
- ✗ Image not pulling → **Confirm Docker image is pushed to correct registry**

## ■ Future Enhancements

- ✚ Add CI pipeline with GitHub Actions
- ✚ Deploy on cloud-managed Kubernetes (EKS/GKE/AKS)
- ✚ Add Helm chart support
- ✚ Extend application with backend service + database

## ■ Author

Sohel Shaikh

B.Tech CSE, Dr. Babasaheb Ambedkar Technological University

**GitHub:** [Sohel9146](#)