

Project Documentation: Helm Deployment Automation API

1. Project Charter

Project Name: Helm Deployment Automation API

Project Sponsor: [Your Company Name]

Project Manager: [Your Name]

Scope:

- Automate Helm Chart Generation
- Automate GitHub Actions / GitLab CI/CD pipeline creation
- Deploy applications automatically to AWS EKS
- Provide APIs for status monitoring

Success Criteria:

- API successfully generates valid Helm charts.
- CI/CD pipelines deploy applications automatically.
- The system can scale to 100+ concurrent deployments.
- The API achieves 99.9% uptime in production.

2. Work Breakdown Structure (WBS)

- Phase 1: API Development
 - Set up API framework (NestJS/Express.js)
 - Implement Helm Chart Generator API
 - Implement CI/CD Integration
 - Deploy to AWS EKS
 - Implement Webhooks for Git triggers
- Phase 2: UI Development (Future)

- Web UI for Helm chart customization
- Dashboard for deployment monitoring

3. Project Roadmap

Milestones:

- Project Kickoff: Finalize scope, team, and approach (Week 1)
- API Framework: Set up project structure and API base (Week 2)
- Helm Automation: Implement `/generate-helm`` API (Week 3)
- CI/CD Integration: Implement `/generate-ci-cd`` API (Week 4)
- AWS Deployment: Implement `/deploy`` for AWS EKS (Week 5)
- Webhooks: Implement `/webhook`` for Git triggers (Week 6)
- Testing & Debugging: Validate API with real deployments (Week 7)
- Deployment: Final testing & go-live (Week 8)

4. Risk Management Plan

- API scaling issues: Medium risk, high impact. Mitigation: Use AWS auto-scaling.
- Security vulnerabilities: High risk, high impact. Mitigation: Implement API authentication & encryption.
- Helm misconfigurations: Medium risk, high impact. Mitigation: Validate charts before applying.
- AWS authentication failures: Low risk, high impact. Mitigation: Use IAM roles & permissions.

5. Resource Management Plan

Roles & Responsibilities:

- Project Manager (Senior): Planning, risk management, reporting.
- Tech Lead (Senior): System architecture, API design, security.

- Backend Developers (Mid-Senior, 2x): API development, Kubernetes SDK, Helm.
- DevOps Engineers (Mid-Senior, 2x): AWS EKS setup, Helm automation, CI/CD.
- QA Engineer (Mid): API testing, CI/CD validation.
- Cloud Architect (Consultant): AWS best practices, cost optimization.
- Technical Writer (Junior-Mid): Documentation, API guides.

Estimated Monthly Cost: ~\$55,000

Estimated Total Cost (4 months): ~\$220,000

6. Cost Management Plan

Estimated Cost per Month:

- AWS EKS Cluster: \$100
- AWS RDS (PostgreSQL): \$50
- AWS Lambda (Webhooks): \$10
- AWS S3 (Helm storage): \$5
- GitHub Actions (CI/CD): \$20
- CloudWatch Logging: \$15
- API Hosting & Gateway: \$10
- Total Estimated Cost: \$210/month

7. Deployment Plan

Stages of Deployment:

- Development: Local Kubernetes cluster (Minikube).
- Staging: AWS EKS test cluster for integration testing.
- Production: AWS EKS prod cluster for live deployment.

Deployment Checklist:

- Validate Helm chart and YAML configurations.

- Run CI/CD pipeline and confirm successful deployment.
- Ensure API authentication and security best practices.

8. Success Criteria

- API generates Helm charts successfully and commits them to Git.
- CI/CD pipelines automatically deploy applications.
- The system scales to 100+ concurrent deployments.
- The API achieves 99.9% uptime in production.