**Automated Build and Deployment Pipelines (CI/CD)**

**Tooling:** GitHub Actions / GitLab CI / Jenkins / CircleCI

**Pipeline Structure:**

* **Trigger Points:**
  + On push to develop or main branch
  + On pull request creation or merge
* **Pipeline Stages:**
  + **Linting & Static Code Analysis:** Run eslint, black, flake8, or similar tools
  + **Unit & Integration Tests:** Run using pytest, jest, or mocha
  + **Build Artifacts:** Docker images tagged with commit hash
  + **Security Scanning:** Trivy or Snyk for dependency vulnerabilities
  + **Deployment:**
    - **Dev/Staging:** Auto-deployed to Heroku/Elastic Beanstalk/K8s
    - **Prod:** Manual approval with rollback option
  + **Notifications:** Slack/email alerts for success/failure
* **Secrets Management:** Injected at runtime via GitHub/GitLab secrets