Document 2: Technical Development Standards

Title: Software Development Handbook

Department: Technology/Engineering

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1. Git Repository Management

Repository Structure:

text

```
main/
□□□ src/           # Source code
□□□ tests/         # Unit and integration tests
□□□ docs/          # Documentation
□□□ .github/       # GitHub Actions workflows
□□□ README.md      # Project overview
```

Branching Strategy:

main: Production-ready code only

develop: Integration branch

feature/*: New features (e.g., feature/user-auth)

hotfix/*: Critical production fixes

release/*: Release preparation

Commit Guidelines:

Format: type(scope): description

Types: feat, fix, docs, style, refactor, test, chore

Example: feat(auth): add OAuth2 login support

2. Code Review Process

Pull Request Requirements:

All tests must pass

Code coverage should not decrease

At least one senior engineer approval required

Link to JIRA ticket in PR description

PR size limited to 400 lines maximum

Review Checklist:

Follows coding standards

Includes adequate tests

Documentation updated

No security vulnerabilities

Performance considerations addressed

Emergency Merge Process:

Contact release manager for approval

Add [EMERGENCY] prefix to PR title

Post-merge review required within 24 hours

Document reason in incident log

3. Deployment Pipeline

Environments:

Development: Auto-deploy on merge to develop

Staging: Manual promotion required

Production: Approval from two leads required

Deployment Schedule:

Feature releases: Tuesday/Thursday 10 PM EST

Hotfixes: Anytime with emergency approval

Database migrations: Weekend maintenance window

Rollback Procedure:

Identify faulty deployment version

Execute: git revert [commit-hash]

Trigger deployment pipeline

Notify stakeholders via #deployments channel

4. API Development Standards

REST API Guidelines:

Use nouns for resources (e.g., /users, /orders)

Version in URL: /api/v1/resource

Filtering: /users?department=engineering&active=true

Pagination: /users?page=2&limit=50

Response Format:

json

```
{
"data": {},
"meta": {
  "pagination": {},
  "timestamp": "2024-01-15T10:30:00Z"
},
"errors": []
}
```

Error Codes:

400: Bad Request (validation errors)

401: Unauthorized (missing/invalid token)

403: Forbidden (insufficient permissions)

404: Resource Not Found

429: Rate Limit Exceeded

500: Internal Server Error

5. Database Guidelines

PostgreSQL Standards:

Use snake_case for table and column names

Index foreign keys and frequently queried columns

Set up connection pooling (PgBouncer recommended)

Regular vacuum and analyze operations

Migration Management:

Use Flyway for database migrations

Every migration must be idempotent

Include rollback script

Test migrations on staging first

Backup Policy:

Full backup daily at 2 AM UTC

Transaction log backup every 15 minutes

Retention: 30 days for daily, 1 year for monthly

Test restore procedure quarterly

6. Monitoring and Alerting

Required Metrics:

Application: Response time, error rate, throughput

Infrastructure: CPU, memory, disk usage

Business: Active users, transaction volume

Alert Thresholds:

P1 (Critical): Response time > 5s for 5 minutes

P2 (High): Error rate > 5% for 10 minutes

P3 (Medium): Disk usage > 85%

P4 (Low): Certificate expires in 30 days

On-call Rotation:

Primary: Current week's assigned engineer

Secondary: Previous week's engineer

Escalation: Team lead after 15 minutes no response