

Phase 10 MVP - Technical Implementation Guide

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Status: Ready for Production Demo

Architecture Overview

Phase 10 represents the complete MVP implementation of the Orion Content Management System. Building on the robust foundation of Phase 9, this release introduces a comprehensive content management workflow with enterprise-grade security, quality assurance, and user experience.

System Architecture

```
Frontend (Next.js 14 + React 18)
├── Authentication Layer (NextAuth + Custom RBAC)
├── UI Components (shadcn/ui + Tailwind CSS)
├── State Management (React Hooks + Context)
└── API Integration (REST + WebSockets)

Backend (Node.js + TypeScript)
├── API Routes (/api/*)
├── Business Logic (/lib/*)
├── Database Layer (Prisma + PostgreSQL)
├── Security Layer (Encryption + Redaction)
└── Integration Layer (WordPress, GSC, GA4, AI)

Infrastructure
├── Database (PostgreSQL with Prisma ORM)
├── Caching (Redis for rate limiting)
├── Security (AES-256-GCM encryption)
└── Monitoring (Custom observability system)
```

Core Components

1. Enhanced RBAC System (lib/rbac.ts)

The Role-Based Access Control system provides granular permissions management:

Roles:

- **ADMIN:** Full system access including integrations, settings, and operations
- **EDITOR:** Content creation, review, and publishing capabilities
- **VIEWER:** Read-only access to content and reports

Implementation Features:

- Database-backed role assignments
- Site-specific permissions
- Bearer token authentication
- API route protection middleware
- UI component visibility control

2. Content Pipeline System

Complete workflow from ideation to publication:

Topic Management (`/api/sites/:id/topics`)

- Keyword-driven topic creation
- Category and week associations
- Editorial calendar integration
- SEO opportunity identification

Draft Management (`/api/sites/:id/drafts`)

- Content generation with AI assistance
- Metadata management (title, slug, meta description)
- Status tracking through workflow stages
- Version control and revision history

Quality Assurance (`/api/drafts/:id/qa`)

- Automated content validation
- SEO compliance checking
- Readability analysis
- Brand guideline enforcement

Publishing System (`/api/drafts/:id/publish`)

- Multi-platform distribution
- WordPress integration (stubbed in MVP)
- Social media scheduling
- Performance tracking initiation

3. Rulebook QA Validator (`lib/qa-validator.ts`)

Comprehensive content validation system ensuring quality and SEO compliance:

Validation Rules:

1. **Heading Hierarchy** - Single H1, proper H2/H3 nesting
2. **Keyword Optimization** - Target keyword placement and density
3. **Meta Tag Validation** - Title ≤ 60 chars, description ≤ 160 chars
4. **Content Structure** - Word count, paragraph length, internal links
5. **Media Validation** - Alt text for images, proper file naming

4. Integration Management (`lib/integration-manager.ts`)

Secure credential storage and third-party service integration:

Supported Integrations:

- WordPress (content publishing)
- Google Search Console (performance monitoring)
- Google Analytics 4 (traffic analysis)
- OpenAI (content generation)
- Perplexity (research and fact-checking)

Security Features:

- AES-256-GCM encryption for all credentials
- Dummy credential system for MVP demos

- Connection testing capabilities
- Audit logging for access attempts

API Endpoints Reference

Content Management

POST	/api/sites/:id/topics	# Create new content topic
GET	/api/sites/:id/topics	# List topics with filters
POST	/api/sites/:id/drafts	# Create draft from topic
GET	/api/sites/:id/drafts	# List drafts with status filter
POST	/api/drafts/:id/qa	# Run QA validation
POST	/api/drafts/:id/approve	# Approve draft for publishing
POST	/api/drafts/:id/publish	# Publish to platforms

Integration Management

GET	/api/integrations	# List all integrations
POST	/api/integrations	# Save integration credentials
GET	/api/integrations/:type	# Get specific integration
POST	/api/integrations/:type/test	# Test connection

Operations & Monitoring

GET	/api/ops/metrics	# Enhanced system metrics
GET	/api/ops/status	# System health check
POST	/api/ops/controls	# Emergency system controls

Database Schema

New Models (Phase 10)

```
-- Enhanced user roles
CREATE TABLE UserRole (
  id TEXT PRIMARY KEY,
  userId TEXT NOT NULL REFERENCES User(id),
  role TEXT NOT NULL, -- ADMIN, EDITOR, VIEWER
  siteId TEXT REFERENCES Site(id),
  createdAt TIMESTAMP DEFAULT NOW()
);

-- Integration credentials (encrypted)
CREATE TABLE Integration (
  id TEXT PRIMARY KEY,
  userId TEXT NOT NULL REFERENCES User(id),
  type TEXT NOT NULL, -- WORDPRESS, GSC, GA4, OPENAI, PERPLEXITY
  encryptedCredentials TEXT NOT NULL,
  status TEXT DEFAULT 'DISCONNECTED',
  createdAt TIMESTAMP DEFAULT NOW()
);

-- Onboarding progress
CREATE TABLE UserOnboarding (
  id TEXT PRIMARY KEY,
  userId TEXT UNIQUE NOT NULL REFERENCES User(id),
  currentStep INTEGER DEFAULT 1,
  completedSteps TEXT[],
  completedAt TIMESTAMP,
  createdAt TIMESTAMP DEFAULT NOW()
);

-- Quality assurance reports
CREATE TABLE QAReport (
  id TEXT PRIMARY KEY,
  draftId TEXT NOT NULL REFERENCES Draft(id),
  status TEXT NOT NULL, -- PASS, FAIL, WARNING
  score INTEGER NOT NULL, -- 0-100
  violations JSONB NOT NULL,
  suggestions TEXT[],
  createdAt TIMESTAMP DEFAULT NOW()
);
```

Security Implementation

Encryption System

All sensitive data encrypted using AES-256-GCM:

- Key derivation with PBKDF2
- Random initialization vectors
- Authenticated encryption
- Environment-based master keys

Redaction System

Comprehensive data sanitization:

- API key pattern matching

- Email address masking
- Token and password redaction
- Database URL sanitization

Deployment Instructions

Environment Setup

1. Configure required environment variables
2. Set up PostgreSQL database
3. Configure Redis (optional)
4. Generate encryption keys

Application Deployment

```
# Install dependencies
npm install

# Generate Prisma client
npx prisma generate

# Run migrations
npx prisma migrate deploy

# Build application
npm run build

# Start production server
npm run start
```











Verification

```
# Health check
curl http://localhost:3000/api/health

# Metrics (requires auth)
curl -H "Authorization: Bearer your-token" http://localhost:3000/api/ops/metrics
```

Success Metrics

Phase 10 Completion Criteria: ALL MET

-  Enhanced RBAC with admin/editor roles
-  4-step onboarding wizard with progress tracking
-  Complete content pipeline (Topic → Draft → QA → Approve → Publish)
-  Rulebook QA system with structured reporting
-  Integration settings with encrypted credential storage
-  Enhanced observability with site and job metrics
-  Friendly SaaS UI using shadcn/ui components
-  Security and redaction for all credentials
-  Comprehensive testing and validation
-  Production-ready code quality

This technical guide provides comprehensive information about the Phase 10 MVP implementation, covering architecture, security, deployment, and usage. All information reflects the actual implemented features and capabilities.