Requirements Documentation

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Requirements Documentation

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Requirements Documentation

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1. Introduction

1.1 Purpose

The purpose of this requirements documentation is to define, in detail, the functional and non-functional requirements for the ADPA (Advanced Document Processing & Automation) Framework. ADPA is designed to automate the creation of standards-compliant documentation for enterprise environments, supporting business analysis, project management, and data governance. Leveraging AI and modular architecture, it serves as a foundation for professional, scalable, and secure document generation and workflow automation.

1.2 Scope

ADPA provides:

- Modular, extensible automation for requirements, project, and data management artifacts.
- AI-powered content generation using multiple providers.
- CLI, REST API, and admin web interfaces for flexible enterprise integration.
- Compliance with industry standards (BABOK v3, PMBOK 7th Edition, DMBOK 2.0).
- Enterprise-ready integrations (Confluence, SharePoint, Adobe, VCS).
- Security, regulatory compliance, and scalability for Fortune 500 environments.

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2. Stakeholders & Users

- **Business Analysts**: Automate requirements, stakeholder, and solution documentation.
- **Project Managers**: Generate project charters, management plans, and compliance reports.
- **Data Stewards/Architects**: Produce data management and governance documentation.
- **Enterprise Architects**: Integrate documentation workflows into enterprise systems.

- **Developers/DevOps**: Extend, customize, or embed ADPA in CI/CD pipelines.
- **Compliance & Audit Teams**: Ensure regulatory and standards adherence.

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3. Functional Requirements

3.1 Document Generation

- **FR-1**: Generate documentation compliant with BABOK v3 (Business Analysis), PMBOK 7th Edition (Project Management), and DMBOK 2.0 (Data Management; in progress).
- **FR-2**: Support template-driven creation with dynamic variable injection and AI-generated content.
- **FR-3**: Allow output in multiple formats: Markdown, PDF, DOCX, JSON.
- **FR-4**: Enable batch and automated document generation through CLI and API.
- **FR-5**: Provide pre-built templates and allow custom template management.
- **FR-6**: Offer cross-framework document integration (e.g., combine requirements and project management outputs).

3.2 AI Provider & Context Management

- **FR-7**: Integrate with multiple AI providers (OpenAI, Google AI, GitHub Copilot, Ollama, Azure OpenAI) with failover and selection mechanisms.
- **FR-8**: Support intelligent context management for prompt optimization and relevant output.
- **FR-9**: Allow interactive AI provider selection via CLI or configuration file.
- **FR-10**: Enable provider setup and credential management via configuration and environment files.

3.3 Interfaces

- **FR-11**: Provide a robust CLI with commands for generation, integration, and administration.
- **FR-12**: Expose a production-ready REST API (OpenAPI/TypeSpec) for all major operations.
- **FR-13**: Deliver a web-based admin interface (Next.js) for template, job, and integration management.
- **FR-14**: Offer API documentation and interactive Swagger/Redoc UI.

3.4 Enterprise Integrations

- **FR-15**: Integrate with Atlassian Confluence for direct document publishing.
- **FR-16**: Integrate with Microsoft SharePoint for document library management, metadata, and version control.
- **FR-17**: Integrate with Adobe Document Services for advanced PDF and InDesign output.
- **FR-18**: Support version control system operations (GitHub, GitLab, Azure DevOps).
- **FR-19**: Provide identity management integration (Active Directory, SAML, OAuth2).

3.5 Security & Compliance

- **FR-20**: Implement enterprise-grade authentication (API key, OAuth2, JWT).
- **FR-21**: Enforce RBAC and auditing for sensitive operations.
- **FR-22**: Ensure compliance with key regulations (GDPR, SOX, PCI DSS, FINRA, Basel III, HIPAA, FedRAMP).
- **FR-23**: Enable usage logging, metrics, and health endpoints for monitoring.

3.6 Collaboration & Workflow (Roadmap/Q3 2025)

- **FR-24**: Support multi-user project sharing and permissions.

- **FR-25**: Enable real-time document collaboration and approval workflows.
- **FR-26**: Provide audit trails and change tracking for all collaborative actions.

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4. Non-Functional Requirements

4.1 Performance & Scalability

- **NFR-1**: Support horizontal scaling via microservices architecture.
- **NFR-2**: Capable of batch-processing hundreds of documents concurrently.
- **NFR-3**: API endpoints must respond within 500ms for standard requests.
- **NFR-4**: Provide caching (Redis) for AI and document generation operations.

4.2 Reliability & Availability

- **NFR-5**: Ensure 99.9% uptime for API and admin interfaces.
- **NFR-6**: Support graceful failover for AI provider outages.
- **NFR-7**: Provide health, readiness, and liveness endpoints.

4.3 Usability

- **NFR-8**: CLI, API, and web UI must be intuitive, with comprehensive help and documentation.
- **NFR-9**: Support accessibility best practices in web UI.
- **NFR-10**: Offer interactive onboarding for new users and integrations.

4.4 Security

- **NFR-11**: All sensitive configuration must be stored securely (environment files, key vaults).

- **NFR-12**: CSRF/XSS/Injection protections in web and API layers.
- **NFR-13**: Encrypted communication for all endpoints (HTTPS/TLS).
- **NFR-14**: Regular dependency scanning and vulnerability management.

4.5 Maintainability & Extensibility

- **NFR-15**: Codebase in strict TypeScript with ESLint/Prettier/Conventional Commits.
- **NFR-16**: Modular architecture, supporting plug-and-play for new frameworks or integrations.
- **NFR-17**: Comprehensive automated test coverage (unit, integration, performance).

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5. System Architecture Overview

5.1 Core Components

- **AI Processing Engine**: Multi-provider orchestration, context management.
- **Document Generator**: Template engine, variable resolution, format conversion.
- **REST API Server**: Express.js, OpenAPI/TypeSpec, security middleware.
- **CLI Interface**: Yargs-based, command modules for all major actions.
- **Integration Layer**: Confluence, SharePoint, Adobe, VCS.
- **Admin Web Interface**: Next.js portal for administration and analytics.
- **Analytics & Reporting**: Usage metrics, compliance dashboards.

5.2 Technology Stack

- **Backend**: Node.js (>=18), TypeScript (>=5.7), Express.js
- **Frontend**: Next.js 14, React 18, Tailwind CSS

- **AI Integrations**: OpenAI, Google AI, GitHub Copilot, Ollama, Azure OpenAI
- **API Spec**: TypeSpec, OpenAPI 3.0, Swagger UI
- **Database**: JSON config, extensible to SQL/NoSQL
- **Testing**: Jest, ts-jest

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6. Integration Requirements

6.1 Confluence Integration

- OAuth2 authentication.
- Publish Markdown and PDF directly to predefined spaces or pages.
- Support for page hierarchies and attachments.

6.2 SharePoint Integration

- Azure AD authentication with device code flow.
- Folder structure, metadata tagging, and versioning per SharePoint best practices.
- Batch and single-document upload.

6.3 Adobe Document Services

- API-based PDF, InDesign, and Illustrator output.
- Template-driven branding and advanced layouts.
- OAuth2 credential management.
- Phase 2: Automated visualizations via Illustrator, image processing via Photoshop.

6.4 Version Control

- Support for Git operations (commit, push).
- Integration with GitHub, GitLab, Azure DevOps (roadmap: hook-based automation).

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7. Compliance & Regulatory Requirements

- **GDPR**: Data privacy for all stored/generated content.
- **SOX, PCI DSS**: Secure handling of sensitive project or financial data.
- **Basel III, MiFID II, FINRA**: Reporting compliance for financial institutions.
- **ISO 27001, ISO 9001**: Information security and quality management.
- **HIPAA, FedRAMP**: Healthcare/government data support (where relevant).

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8. Installation, Deployment & Configuration

8.1 Installation

- NPM global package (`npm install -g adpa-enterprise-framework-automation`).
- Source build (GitHub clone, `npm install` , `npm run build`).
- Docker image (roadmap Q2 2025).

8.2 Configuration

- Environment variables for AI providers, integrations, and security.
- `.env` and `.env.example` templates provided.
- CLI and web UI guided setup for integrations.

8.3 Admin Interface

- Setup with `npm run admin:setup` and `npm run admin:serve` .
- Accessible at `http://localhost:3001` .

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9. Testing & QA

- Automated unit, integration, and performance tests via Jest.
- Scripts for provider- and feature-specific testing (`test:azure` , `test:github` , `test:ollama`).
- Integration and end-to-end tests for all major workflows.
- Health and readiness endpoints for CI/CD checks.

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10. Roadmap & Future Enhancements

- **Q2 2025**: DMBOK 2.0 full implementation, Docker/Kubernetes support, analytics dashboard.
- **Q3 2025**: Enterprise SSO, real-time collaboration, advanced workflow automation, mobile app support.

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11. Constraints & Assumptions

- Node.js 18+ and TypeScript 5.7+ required.
- Access to AI provider credentials required for full functionality.
- Some features (e.g., DMBOK, real-time collaboration) are roadmap items and may be incomplete in current release.

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12. Glossary

- **BABOK**: Business Analysis Body of Knowledge
- **PMBOK**: Project Management Body of Knowledge
- **DMBOK**: Data Management Body of Knowledge
- **AI Provider**: External or local large-language model API or engine
- **CLI**: Command-Line Interface
- **RBAC**: Role-Based Access Control
- **OAuth2**: Open Authorization standard for secure delegated access

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13. References

- PMI PMBOK 7th Edition
- IIBA BABOK v3
- DAMA DMBOK 2.0
- Project Repository & Wiki

End of Requirements Documentation
