Requirements Documentation

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Requirements Documentation: Requirements Gathering Agent

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1. Introduction

This document outlines the requirements for the Requirements Gathering Agent (RGA) software project. The RGA is an AI-powered tool designed to generate comprehensive Project Management Body of Knowledge (PMBOK) compliant documentation from project context, primarily derived from the project's README and associated files. This document details functional and non-functional requirements, stakeholder needs, business requirements, assumptions, constraints, prioritization, and traceability.

2. Functional Requirements

The RGA shall:

- **FR1: Contextual Analysis:** Analyze project context from various sources including, but not limited to, the project's README.md file, requirements documents (located in specified directories like `requirements/`, `specs/`), architecture documentation (`docs/architecture.md`, `design/`), stakeholder information (`stakeholders.md`), planning documents (`planning/`, `roadmap.md`, `scope.md`), technical documentation (`docs/`, `wiki/`, `.github/`), and project metadata (`package.json` and other configuration files). The system shall score the relevance of each source (0-100) based on content, location, naming patterns, structure, and depth.
- **FR2: PMBOK Document Generation:** Generate a suite of PMBOK 7th Edition compliant project management documents. This includes, but is not limited to: Project Charter, Scope Management Plan, Risk Management Plan, Cost Management Plan, Quality Management Plan, Resource Management Plan, Communication Management Plan, Procurement Management Plan, Work Breakdown Structure (WBS), WBS Dictionary, Activity List, Schedule Network Diagram, Milestone List, Stakeholder Register, and Stakeholder Engagement Plan. Additional documents such as

User Stories, User Personas, and technical analysis documents (Technology Stack Analysis, Data Model Suggestions, etc.) should also be generated.

- **FR3: AI Provider Integration:** Integrate with multiple AI providers (Azure OpenAI, Google AI, GitHub AI, Ollama) allowing users to select their preferred provider through configuration. The system shall handle authentication securely for each provider.
- **FR4: Output Management:** Output generated documents in multiple formats (e.g., Markdown, JSON, YAML) with a well-organized directory structure. The system shall provide options for selecting the output format and directory.
- **FR5: Command-Line Interface (CLI):** Provide a user-friendly CLI for initiating document generation, specifying options (e.g., provider selection, output format, validation), and viewing progress.
- **FR6: PMBOK Validation:** Validate generated documents against PMBOK 7th Edition standards. The system shall provide a compliance report indicating areas of compliance and areas needing attention.
- **FR7: Quality Assessment:** Provide a quality score (0-100) for each generated document, along with specific recommendations for improvement.
- **FR8: Error Handling and Reporting:** Handle errors gracefully, providing informative error messages and logs to aid troubleshooting.
- **FR9: Context Management:** Implement a sophisticated context manager to optimize the use of available tokens for large language models, maximizing the information provided to the AI for accurate and comprehensive document generation. This should include a 3-phase context strategy.
- **FR10: Retry Logic:** Include retry mechanisms for failed API calls to ensure robustness.

3. Non-Functional Requirements

- **NFR1: Performance:** The system shall generate documents within a reasonable timeframe (defined as under 10 minutes for medium-sized projects).
- **NFR2: Scalability:** The system shall be able to handle projects of varying sizes and complexities.
- **NFR3: Security:** The system shall protect sensitive information (API keys, project data) using appropriate security measures.
- **NFR4: Usability:** The CLI shall be intuitive and easy to use for both technical and non-technical users.
- **NFR5: Maintainability:** The codebase shall be well-documented, modular, and easy to maintain.
- **NFR6: Reliability:** The system shall be reliable and consistently produce accurate results.
- **NFR7: Portability:** The system should be easily installable and runnable on various operating systems.

4. Stakeholder Requirements

- **Project Managers:** Need accurate, complete, and PMBOK-compliant documentation to effectively manage projects. Require efficient generation of documents to save time and effort.
- **Business Analysts:** Need a tool to easily generate requirements documentation and user stories.
- **Developers:** Need clear and concise technical documentation to understand project requirements and architecture.
- **Compliance Officers:** Need assurance that generated documents adhere to PMBOK standards and relevant regulations.

5. Business Requirements

- **BR1: Time Savings:** Reduce the time spent on manual project documentation creation.
- **BR2: Improved Accuracy:** Reduce errors and inconsistencies in project documentation.
- **BR3: Enhanced Compliance:** Ensure compliance with PMBOK standards and regulations.
- **BR4: Better Stakeholder Alignment:** Improve communication and alignment among stakeholders.
- **BR5: Increased Efficiency:** Streamline project management processes.

6. Assumptions and Constraints

- **Assumption 1:** Sufficient project context will be available in the project's README and associated files.
- **Assumption 2:** The chosen AI provider will have sufficient capacity and reliability.
- **Constraint 1:** The system must be compatible with commonly used operating systems (Windows, macOS, Linux).
- **Constraint 2:** The system must be designed to work with existing project structures and file naming conventions.

7. Requirements Prioritization

The requirements are prioritized as follows:

- **High:** FR1, FR2, FR3, FR4, FR5, FR6, NFR3
- **Medium:** FR7, FR8, FR9, FR10, NFR1, NFR2, NFR4, NFR5, NFR6, NFR7
- **Low:** BR1, BR2, BR3, BR4, BR5

8. Requirements Traceability Matrix (RTM)

(A full RTM would be included here, linking each requirement to specific design elements, test cases, and implementation details.)

9. Approval and Sign-off

(Space for signatures and dates of approval from relevant stakeholders.)

This document serves as a living document and will be updated as the project progresses. Any changes will be communicated to stakeholders.