## Risk Analysis: Requirements Gathering Agent Project

This document outlines the risk analysis for the Requirements Gathering Agent project, identifying potential risks, assessing their likelihood and impact, and proposing mitigation strategies. This analysis follows PMBOK Guide risk management best practices.

### Risk Identification

Risks are categorized into Technical, Project Management, Business, and External categories.

#### Technical Risks

| Risk ID | Risk Description | Risk Category | Risk Triggers |
| --- | --- | --- | --- |
| TR-1 | Azure OpenAI API unavailability or rate limiting. | Technical | High API usage, service outages, exceeding API limits. |
| TR-2 | Incompatibility between different AI providers (Azure, Google, GitHub, Ollama). | Technical | Changes in API specifications, model limitations. |
| TR-3 | Unexpected behavior or limitations of large language models (LLMs). | Technical | Model hallucinations, bias in generated content, unexpected output formats. |
| TR-4 | Failure to accurately process diverse input document formats. | Technical | Unexpected file structures, unsupported file types, corrupted data. |
| TR-5 | Security vulnerabilities in AI provider integrations. | Technical | API exploits, data breaches, insecure configurations. |
| TR-6 | Issues with .docx generation (formatting, compatibility). | Technical | Library bugs, OS differences, Microsoft Word version incompatibilities. |

#### Project Management Risks

| Risk ID | Risk Description | Risk Category | Risk Triggers |
| --- | --- | --- | --- |
| PM-1 | Project schedule slippage. | Project Management | Underestimation of development time, unforeseen technical challenges. |
| PM-2 | Resource allocation issues (developer availability). | Project Management | Unexpected absences, competing priorities, skill shortages. |
| PM-3 | Budget overrun. | Project Management | Increased development time, unforeseen costs, inaccurate cost estimations. |
| PM-4 | Scope creep (uncontrolled addition of features). | Project Management | Unclear requirements, stakeholder requests, changing priorities. |
| PM-5 | Insufficient testing and quality assurance. | Project Management | Time constraints, lack of resources, inadequate testing strategies. |
| PM-6 | Communication breakdowns with stakeholders. | Project Management | Lack of clear communication channels, infrequent updates, differing expectations. |

#### Business Risks

| Risk ID | Risk Description | Risk Category | Risk Triggers |
| --- | --- | --- | --- |
| BR-1 | Low market adoption of the tool. | Business | Lack of awareness, insufficient marketing, high competition. |
| BR-2 | Negative user feedback and reviews. | Business | Bugs, usability issues, poor documentation, unmet expectations. |
| BR-3 | Changes in the pricing policies of AI providers. | Business | Increased API costs, changes in pricing models. |
| BR-4 | Inability to secure sufficient funding for ongoing development and maintenance. | Business | Lack of investor interest, insufficient revenue generation. |

#### External Risks

| Risk ID | Risk Description | Risk Category | Risk Triggers |
| --- | --- | --- | --- |
| ER-1 | Geopolitical events impacting AI provider availability. | External | International conflicts, sanctions, regional disruptions. |
| ER-2 | Major changes in relevant industry standards (PMBOK updates). | External | Release of new PMBOK versions, changes in industry best practices. |

### Risk Assessment Matrix

This matrix assesses the probability and impact of each identified risk. Probability is rated as High (H), Medium (M), or Low (L), with percentage estimates. Impact is rated on a scale of 1-5 (1=Low, 5=High). Risk Score is the product of Probability and Impact. Risk Priority is derived from the Risk Score.

| Risk ID | Risk Description | Risk Category | Probability (%) | Impact (1-5) | Risk Score | Risk Priority |
| --- | --- | --- | --- | --- | --- | --- |
| TR-1 | Azure OpenAI API unavailability or rate limiting | Technical | 10 | 4 | 40 | High |
| TR-2 | Incompatibility between different AI providers | Technical | 5 | 3 | 15 | Medium |
| TR-3 | Unexpected behavior or limitations of LLMs | Technical | 20 | 3 | 60 | High |
| TR-4 | Failure to accurately process diverse input document formats | Technical | 15 | 2 | 30 | High |
| TR-5 | Security vulnerabilities in AI provider integrations | Technical | 5 | 5 | 25 | High |
| TR-6 | Issues with .docx generation | Technical | 10 | 2 | 20 | Medium |
| PM-1 | Project schedule slippage | Project Mgmt | 25 | 4 | 100 | Critical |
| PM-2 | Resource allocation issues | Project Mgmt | 15 | 3 | 45 | High |
| PM-3 | Budget overrun | Project Mgmt | 20 | 4 | 80 | Critical |
| PM-4 | Scope creep | Project Mgmt | 30 | 3 | 90 | Critical |
| PM-5 | Insufficient testing and quality assurance | Project Mgmt | 10 | 3 | 30 | High |
| PM-6 | Communication breakdowns with stakeholders | Project Mgmt | 15 | 2 | 30 | High |
| BR-1 | Low market adoption | Business | 30 | 3 | 90 | Critical |
| BR-2 | Negative user feedback and reviews | Business | 20 | 4 | 80 | Critical |
| BR-3 | Changes in the pricing policies of AI providers | Business | 10 | 3 | 30 | High |
| BR-4 | Inability to secure sufficient funding | Business | 15 | 5 | 75 | Critical |
| ER-1 | Geopolitical events impacting AI provider availability | External | 5 | 4 | 20 | Medium |
| ER-2 | Major changes in relevant industry standards | External | 2 | 2 | 4 | Low |

### Risk Response Planning

#### Risk Mitigation Strategies

The following mitigation strategies are proposed, categorized by risk response type:

**Avoid:**

* **TR-2 (Incompatibility):** Prioritize one primary AI provider for initial release, adding others incrementally. Thoroughly test compatibility before introducing new providers.
* **PM-4 (Scope Creep):** Implement a robust change management process with formal requests, impact assessments, and stakeholder approvals.

**Mitigate:**

* **TR-1 (API Unavailability):** Implement robust error handling and retry mechanisms. Explore alternative AI providers as backups. Monitor API usage closely.
* **TR-3 (LLM Limitations):** Use multiple LLMs for comparison and validation. Implement human review of critical outputs.
* **TR-4 (Input Processing):** Develop comprehensive input validation and data cleaning procedures. Support a wide range of common file formats.
* **TR-5 (Security):** Use secure API keys and authentication methods. Conduct regular security audits and penetration testing.
* **TR-6 (.docx Issues):** Thoroughly test across different Word versions and operating systems. Consider using a robust and well-maintained .docx generation library.
* **PM-1 (Schedule Slippage):** Use agile methodologies with iterative development and frequent reviews. Establish clear milestones and deadlines.
* **PM-2 (Resource Issues):** Over-allocate resources slightly to account for potential absences. Develop a plan for onboarding additional resources if needed.
* **PM-3 (Budget Overrun):** Regularly monitor expenses against the budget. Establish clear cost controls and approval processes.
* **PM-5 (Testing):** Develop a comprehensive testing plan with unit, integration, and user acceptance testing. Allocate sufficient time and resources for testing.
* **PM-6 (Communication):** Establish regular communication channels (e.g., weekly meetings, email updates). Use project management software for task and progress tracking.
* **BR-1 (Low Adoption):** Develop a comprehensive marketing and outreach plan. Offer free trials and demos. Gather user feedback to improve the product.
* **BR-2 (Negative Feedback):** Implement a system for collecting and addressing user feedback promptly. Actively monitor online reviews and respond to concerns.
* **BR-3 (AI Provider Pricing):** Negotiate favorable pricing contracts with AI providers. Build in flexibility to switch providers if necessary.
* **BR-4 (Funding):** Develop a robust business plan with clear revenue projections. Seek funding from investors or explore alternative revenue models.
* **ER-1 (Geopolitical Events):** Have backup AI providers in different geographic locations. Monitor geopolitical events and adjust plans as needed.
* **ER-2 (Industry Standard Changes):** Stay updated on PMBOK changes