**Risk Management Document: Hospital Management System**

## 1. Introduction

This document outlines the risk management plan for the development of the Hospital Management System, detailing potential risks, their likelihood, impact, and mitigation strategies. It aligns with the principles of proactive risk management, emphasizing continuous monitoring and adaptation throughout the project lifecycle.

## 2. Project Overview

The Hospital Management System is a web-based application designed to streamline hospital operations, enhance patient care, and integrate AI technologies for advanced functionalities. Key features include doctor and patient management, AI-driven tools (face recognition, emotion detection, medicine recognition, and mask compliance detection), and role-based access control.

## 3. Risk Management Approach

The risk management process for this project will follow an iterative approach, encompassing risk identification, analysis, planning, tracking, and control. This approach ensures that risks are proactively managed, and mitigation strategies are implemented effectively.

## 4. Risk Identification

Based on the SRS document and the risk management principles, the following potential risks have been identified:

- **Technical Risks**
  - Incompatibility of AI components with the server environment.
  - Failure of camera hardware to function correctly for AI features.
  - Issues with CORS configuration affecting API integration.
  - Scalability issues under high user load.
  - Data loss due to system failure.
- **Schedule Risks**
  - Delays in AI model development and integration.
  - Underestimation of development time for complex features.
  - Project delays due to the complexity of system.
- **Resource Risks**
  - Lack of staff with the required AI development expertise.
  - Insufficient team size to meet project deadlines.
  - Team members turnover.
- **Requirement Risks**
  - Changes in project scope or requirements.
  - Misunderstanding of requirements leading to rework.
  - Unstable project scope.
- **External Risks**
  - Changes in healthcare regulations impacting system requirements.
  - Delays in the availability of hosting infrastructure.

## 5. Risk Analysis

Each identified risk will be analyzed to assess its probability and potential impact on the project. The risk exposure will be calculated using the formula: Risk Exposure (RE) = Probability of Occurrence * Impact.

| Risk | Category | Probability | Impact (1-5) | Risk Exposure |
|---|---|---|---|---|
| Incompatibility of AI components | Technical | 0.5 | 4 | 2.0 |
| Failure of camera hardware | Technical | 0.3 | 3 | 0.9 |
| CORS configuration issues | Technical | 0.4 | 3 | 1.2 |
| Scalability issues | Technical | 0.6 | 4 | 2.4 |
| Data loss | Technical | 0.2 | 5 | 1.0 |
| Delays in AI model development | Schedule | 0.5 | 4 | 2.0 |
| Underestimation of development time | Schedule | 0.7 | 3 | 2.1 |
| Project delays due to complexity | Schedule | 0.6 | 4 | 2.4 |
| Lack of staff with AI expertise | Resource | 0.4 | 5 | 2.0 |
| Insufficient team size | Resource | 0.3 | 4 | 1.2 |
| Team member turnover | Resource | 0.2 | 3 | 0.6 |
| Changes in project scope | Requirement | 0.6 | 4 | 2.4 |
| Misunderstanding of requirements | Requirement | 0.5 | 3 | 1.5 |
| Unstable project scope | Requirement | 0.4 | 4 | 1.6 |
| Changes in healthcare regulations | External | 0.3 | 5 | 1.5 |
| Delays in availability of hosting infrastructure | External | 0.2 | 4 | 0.8 |

- Probability: Scale from 0.1 (Rare) to 1.0 (Certain)
- Impact: Scale from 1 (Low) to 5 (Catastrophic)

## 6. Risk Response Planning

For each identified risk, mitigation, monitoring, and contingency plans will be developed.

| Risk | Mitigation Strategy |
|---|---|
| Incompatibility of AI components | Thoroughly test AI components in the target server environment early in the development cycle. Use virtualization or containerization to create a consistent environment. |
| Failure of camera hardware | Implement robust error handling for camera access. Provide clear instructions to users for troubleshooting camera issues. Consider supporting multiple camera sources or alternative input methods. |
| CORS configuration issues | Establish a well-defined CORS policy early on. Use a centralized configuration to manage CORS settings. Implement thorough testing of CORS settings across different browsers and environments. |
| Scalability issues | Design the system with scalability in mind. Conduct load testing to identify potential bottlenecks. Use scalable infrastructure and database solutions. Implement caching and optimize database queries. |

| | |
|---|---|
| Data loss | Implement regular data backups and disaster recovery plans. Use database transactions to ensure data consistency. Implement redundancy in storage and server infrastructure. |
| Delays in AI model development | Start AI model development early. Have a backup plan. |
| Underestimation of development time | Use detailed estimation techniques. Add buffer to the schedule. Track progress closely and adjust the schedule as needed. |
| Project delays due to complexity | Break down complex tasks into smaller, manageable units. Use agile development methodologies. Ensure clear communication and collaboration within the team. |
| Lack of staff with AI expertise | Provide training to existing staff. Hire experts. Outsource AI development tasks. |
| Insufficient team size | Negotiate for additional resources. Optimize team workflows. Prioritize tasks and focus on essential features. |
| Team member turnover | Offer competitive compensation and benefits. Create a positive work environment. Invest in knowledge transfer and documentation. |
| Changes in project scope | Establish a clear scope management process. Carefully evaluate and prioritize change requests. Communicate the impact of changes to stakeholders. |
| Misunderstanding of requirements | Use visual aids. Conduct regular reviews. Document requirements clearly and concisely. |
| Unstable project scope | Define clear project boundaries. Prioritize requirements and focus on core functionality. Manage stakeholder expectations effectively. |
| Changes in healthcare regulations | Stay informed about upcoming regulatory changes. Design the system to be adaptable to future changes. Include compliance checks in the testing process. |
| Delays in availability of hosting infrastructure | Start planning for hosting early. Have a backup hosting provider. Use cloud-based hosting solutions for flexibility. |