# Final Project Plan

**MEDIQ**

G1 SOLUTIONS

Group 1:   
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**PRJ566** *Project Planning and Management* – Winter 2025  
**Abidin Akkok**  
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# Table of Contents

[Project Charter 3](#_Toc195644675)

[Project Proposal](#_Toc195644686) 12

[Scope Management Plan 14](#_Toc195644687)

[Schedule Management Plan 23](#_Toc195644697)

[Cost Management Plan 31](#_Toc195644707)

[Quality Management Plan 40](#_Toc195644717)

[Communication Management Plan 47](#_Toc195644727)

[Risk Management Plan 54](#_Toc195644736)

[References 67](#_Toc195644746)

# Project Charter

## Background

Hospital and walk-in clinic wait-times in Ontario have substantially increased over the past several years (The Star, 2024; Health Quality Ontario, 2024). As of now, there is no centralized system that provides Ontarians with accurate wait-times for hospitals and walk-in clinics. Our project consists of a web-based application that provides Ontarians with real-time hospital and walk-in clinic wait-times, enabling them to get the care they need as quickly as possible.

## Goals / Objectives

* To develop a web-based application that collects and displays real-time hospital and walk-in clinic wait-times, ensuring updates are made every 3 hours, submitted by users and healthcare organizations.
* To integrate a location-based searching function enabling users to find the nearest hospital and walk-in clinics with the shortest wait-times and ensure search results are loaded within 5 seconds.
* To implement accurate wait-time reporting, by leveraging historical trends from users and organizations. Our objective is to achieve a minimum of 90% accuracy in wait-time accuracy.

## Scope

The goal of this project is to develop a web-based application that provides real-time hospital and walk-in clinic wait-times for Ontario residents. By offering this tool, we aim to improve access to healthcare and optimize patient flow management, benefiting both patients and healthcare providers. The application will serve as a centralized platform where users can find updated wait-times, locate healthcare facilities, and receive alerts about open slots at preferred clinics or hospitals.

At the end of the project, we aim to deliver a fully functional, user-friendly platform displaying real-time wait-times for hospitals and walk-in clinics across Ontario. The platform will incorporate several key features, including a search function based on location and type of healthcare service (e.g., pediatric, mental health, general practice). Additionally, users will have the ability to receive customized alerts about changes in wait-times or available slots. The system will also leverage community-submitted data to enhance reporting accuracy and integrate map functionality for better navigation.

To ensure a structured and efficient development process, the project will be divided into distinct phases. The Project Initiation phase will focus on defining the problem, securing stakeholder alignment, and finalizing the project charter and proposal. In the Research and Planning phase, we will conduct feasibility analyses, define system requirements, and establish technical architecture. The Design and Prototyping phase will involve UI/UX development, including wireframes and interactive prototypes.

During the Development phase, the team will build backend infrastructure, implement APIs, develop frontend components, and integrate databases. The Testing and Validation phase will ensure platform stability and usability through functional, performance and user acceptance testing. Following this, the Development and Launch phase will roll out the platform for public use, ensuring all technical requirements are met for a smooth release. Finally, the Post-Launch Monitoring phase will include ongoing bug tracking, performance analysis, and iterative improvements based on user feedback.

While the project aims to provide a comprehensive solution, certain activities will remain out of scope. Ongoing maintenance and support beyond the initial launch will not be included in the project. Additionally, marketing and promotional activities related to publicizing the platform will not be covered. Direct partnerships or negotiations with healthcare institutions beyond data-sharing agreements are also outside the scope. Furthermore, the platform will not provide in-depth medical consultations or telehealth services, as its primary focus is wait-time tracking. Lastly, the system will handle only publicly available wait-time data, ensuring compliance with data privacy regulations.

## Key Stakeholders

|  |  |
| --- | --- |
| Client | Province of Ontario |
| Sponsor | Ministry of Health |
| Project manager | Stanislav Chirikov |
| Project team members | Deen Adenowo, Hamza Teli, Jordan Purcell, Leigh Balite, and Matthew MacLennan |
| Development Team | Web developers (Group 1 Project team members) |
| Healthcare Providers | Ontario Hospitals (Ontario Health: Central, East, North East, North West, Toronto, West), Various Ontario Walk-in Clinics |
| End Users | Ontario residents seeking wait-time for healthcare services |

## Project Milestones

1. **Project Initiation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Details** | **Start Date** | **End Date** |
| Project Charter | Finalize project charter and proposal | January 2, 2025 | February 11, 2025 |
| Proposal |
| Stakeholder Alignment | Identify key stakeholders  Secure commitments for funding, data sharing, and partnerships | January 2, 2025 | February 28, 2025 |
| Kick-off Meeting | Assign Group 1 team members (Project manager, team members, development team, etc.) | January 14 | January 21, 2025 |

1. **Research and Planning**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Details** | **Start Date** | **End Date** |
| Scope Management Plan | Define project boundaries, deliverables, and requirements | February 11, 2025 | February 18, 2025 |
| Schedule Management Plan | Establish project timeline, key phases, and deadlines | February 18, 2025 | March 4, 2025 |
| Cost Management Plan | Outline project budget, funding sources. | March 4, 2025 | March 11, 2025 |
| Quality Management Plan | Setup standards, testing procedures, and benchmarks | March 11, 2025 | March 18, 2025 |
| Communication Plan | Define how project updates, reports and feedback will be shared among stakeholders | March 18, 2025 | April 1, 2025 |
| Risk Management Plan | Identify risks, and mitigation strategies | April 1, 2025 | April 8, 2025 |
| Stakeholder Management Plan | Determine approach for engaging stakeholders | April 8, 2025 | April 15, 2025 |
| UI/UX Design | Create initial wireframes and prototypes | March 1, 2025 | April 15, 2025 |
| Kick- Off Presentation | Final Project Plan and presentation | April 15, 2025 | April 15, 2025 |

1. **Executing**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Details** | **Start Date** | **End Date** |
| Product design | Design the product, all its features and start preparing user documentation. | May 13, 2025 | May 27, 2025 |
| Development | Develop the product and finish user documentation. | May 27, 2025 | August 4, 2025 |
| Frontend Development | Develop UI components and integrate backend | May 27, 2025 | July 30, 2025 |
| Backend Development | Implement database, APIs, and authentication mechanisms | June 1, 2025 | July 30, 2025 |
| Mid-project review | Review project progress, budget and all project documentation. | July 1, 2025 | July 8, 2025 |
| Security Audit | conduct security assessments and implement necessary fixes | July 10, 2025 | July 25, 2025 |
| User Testing | Conduct user acceptance testing and refine features | July 20, 2025 | August 4, 2025 |
| Testing | Write and run test scripts, monitor quality and performance. | August 4, 2025 | August 11, 2025 |
| Deployment | Make the product available for users. | August 11, 2025 | August 13, 2025 |

1. **Monitoring and Controlling**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Details** | **Start Date** | **End Date** |
| Final review | Review project results, budget and all project documentation. | August 11, 2025 | August 13, 2025 |

1. **Closing**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Details** | **Start Date** | **End Date** |
| Final review meeting | Review project results, budget, final product with project team, client and sponsor representatives. | August 13, 2025 | August 13, 2025 |

1. **Post-Launch**

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks** | **Details** | **Start Date** | **End Date** |
| Post-Launch product support | Keep monitoring product performance | August 15, 2025 | Ongoing |
| User Feedback Integration | Gather user feedback and propose new features | August 20, 2025 | August 29, 2025 |
| Performance Optimization | Analyze and improve system performance and scalability | August 20, 2025 | August 29, 2025 |

## Project Budget

All work for this project will be performed by a team of 6 project team members who will assume roles of developers, PMO and QA.

**Monthly Recurring Expenses**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cost Type** | **Monthly Rate** | **Quantity** | **Total Monthly Cost** | **Duration (Months)** | **Grand Total Amount** |
| Software Developers | $8,000 | 5 | $40,000 | 8 | $320,000 |
| Project Manager | $10,000 | 1 | $10,000 | 8 | $80,000 |
| Infrastructure & Cloud Services - Planning phase | $1,000 | 1 | $1,000 | 4 | $4,000 |
| Infrastructure & Cloud Services - Execution phase | $5,000 | 1 | $5,000 | 4 | $20,000 |
| Total |  |  |  |  | $424,000 |

**Non-monthly Recurring Expenses**

|  |  |  |  |
| --- | --- | --- | --- |
| **Cost Type** | **Rate** | **Quantity** | **Amount** |
| Hardware | $2,500 | 6 | $15,000 |
| Software | $2,500 | 6 | $15,000 |
| Contingency Reserve (10%) | $46,000 | 1 | $46,000 |
| Total |  |  | $76,000 |

**Project total: $500 000**

## Constraints, Assumptions, Risks and Dependencies

|  |  |
| --- | --- |
| Constraints | * Time: The website must be up within 8 months with development and implementation taking half that time. |
| Assumptions | * Healthcare providers and users will cooperate in sharing real-time wait-time data * Users will adopt the website quickly due to its convenience and utility * Funding will be secured * Internet connectivity is stable |
| Risks | * Funding: Insufficient funding may delay development or limit features. It would be important for the team to first prioritize seeking multiple funding sources and prioritize essential features. * Adoption Challenges: Hospitals and patients could be slow to adopt the application |
| Dependencies | * Healthcare Providers: Cooperation from hospitals and clinics staff to provide real-time wait data. * End-Users: Cooperation from end-users to provide real-time wait data as well as continuous feedback from testers and early adopters to refine the app post-launch * Third-Party APIs: potentially reliant on google maps, or health care provider APIs * Internet and Cloud Services: Reliant on cloud hosting |

## Performance Evaluation

**Quantitative Criteria:**

* Project deliverables must be completed on schedule. Key milestones should be achieved before deadlines to monitor progress and outstanding tasks.
* Track financial expenditures to ensure alignment with the allocated budget.
* Regularly analyzing the project master plan to avoid or minimize deviations.

**Qualitative Criteria:**

* Conduct teal surveys to identify obstacles and areas requiring additional resources.
* Gather stakeholder feedback to assess whether the project meets expectations and requirements.

## Communication

Microsoft Teams is an effective communication platform for weekly meetings to review project progress and to coordinate upcoming tasks.

Concerns or inquiries raised in the communication channel must be acknowledged or addressed within 24hrs.

## Guidelines and Conflict Resolution

Mutual respect among all team members is mandatory.

Each member is accountable for their assigned tasks; delays must be shared or reported to the team's manager during meeting schedules.

In the case of conflict or disagreement, a meeting should be scheduled to collectively discuss and resolve the issue.

**Approval Signatures**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  | Stanislav Chirikov |
| Province of Ontario, Project Client | Ministry of Health, Project Sponsor | Stanislav Chirikov, Project Manager |

# Project Proposal

*Brief description of the system you are proposing. Please include your research reference (contacts, etc.):*

The business application we are developing is a web-based application that provides Ontarians with real-time hospital and walk-in clinic wait-times. Our application will collect data from healthcare organizations every 3 hours and also from user submissions to enhance accuracy. By leveraging historical trends, we aim to help users make informed healthcare decisions.

*Please explain why you feel there is a need/market for this system:*

There is a dire need for quicker healthcare access for Ontarians as wait-times have increased substantially over the past several years. Ontario walk-in clinic wait-times have more than doubled in 2023 (The Star, 2024). On average, patients wait 2.2 hours to see a doctor in the emergency department in Ontario (Healthcare Quality Ontario, 2024). In addition, an estimated 2.5 million people do not have a family doctor in Ontario (CTV News, 2024). This leads them to rely on the ER and walk-in clinics. Therefore, our system provides Ontarians with access to wait-times to find them the clinic with the shortest wait-times as quickly as possible.

*Please describe the system in more detail. Choose the functions that you feel are most important and describe how they will work. Give each function a title and briefly explain its responsibility in a few sentences:*

There are 3 core functions that are most important to our system.

1) **Submission of Wait-times**

The first function is the submission of wait-times for hospitals and walk-in clinics from users and the organization. The organization will update the wait-times every 3 hours. Whereas the users will submit their wait-times via a simple form. Each user is limited to one submission within a 24 hour period. This data will be stored in a database.

2) **Displaying Wait-times:**

The second function displays the wait-times of hospitals and walk-in clinics. This function uses wait-time data submitted by healthcare organizations and users from a database. [Add how we will use historical data]

3) **Search by Location**

The third function uses location-based search to display the closest hospitals and walk-in clinics. This function will utilize Google Maps API for a seamless and fast experience. A user will enter their location (i.e. postal code) or share it, the system will find the nearest hospitals and walk-in clinics for that location.

*Please walk through a typical usage of your system (a scenario). For example, selecting and selling an item; creating an appointment, setting up a sports team:*

**Scenario 1:**

User wants to go to the nearest walk-in clinic but does not want to wait in line for too long. User goes to the web app page, enters their address and chooses the walk-in clinic option. App returns a page with a map centered on the user's location and a list of nearest walk-in clinics with their respective estimated wait-times. Each place is also marked on the map. The user now can sort search results by distance and wait-time.

**Scenario 2:**

A user, who has recently visited a clinic, notices that the actual wait-time differs from the estimated wait-time displayed in the app. To help improve accuracy, they use the “Submit Wait-time” feature within the web app. The system prompts them to enter the facility name, current wait-time, and optional comments about their experience. Once submitted, the app validates the entry by cross-referencing it with other user inputs and official data sources before updating the estimated wait-time. This feature allows users to contribute to more accurate reporting, making the platform more reliable for all users.

# Scope Management Plan

## Introduction

Scope Management is a structured process that ensures all necessary work is completed for the project while preventing unnecessary tasks from being included. The Scope Management Plan provides a framework detailing how the project scope will be defined, developed, and verified, ensuring alignment with project goals. It also identifies who is responsible for managing scope-related activities and controlling any potential changes.

This project follows a five-step **Project Scope Management** process:

1. **Collect Requirements** – The project team will gather, and document essential requirements based on stakeholder inputs, system needs, and project objectives. These requirements will be informed by the project charter and stakeholder discussions, ensuring a comprehensive understanding of what needs to be built. Stakeholder feedback will be continuously integrated to refine requirements and improve system accuracy.
2. **Define Scope** – The scope will be clearly defined to include real-time hospital and walk-in clinic wait-time tracking, user-submitted wait-time reporting, and location-based search functionalities. It will also establish project constraints such as a reliance on healthcare organizations for data updates every 3 hours and limitations regarding system integrations with external health databases.
3. **Create WBS (Work Breakdown Structure)** – The project deliverables will be divided into smaller, manageable components, categorized into core features such as data collection, wait-time display, user submissions, and map integration. This breakdown will facilitate better scheduling, budget tracking, and resource allocation.
4. **Verify Scope** – The project team, in collaboration with the client (Province of Ontario) and sponsor (Ministry of Health), will ensure all deliverables meet the agreed-upon specifications. Formal signoffs will be required at key milestones, and user testing will be conducted to validate functionality.
5. **Control Scope** – The scope will be actively monitored throughout the project lifecycle, with a defined process for reviewing and approving any requested changes. Change requests will be evaluated based on impact, feasibility, and stakeholder approval to prevent scope creep.

This Scope Management Plan ensures the project remains aligned with its objectives while providing mechanisms for scope control and verification. It establishes a structured approach to project execution, ensuring that only necessary and approved work is undertaken to achieve a successful implementation of the healthcare wait-time tracking system.

## Scope Management Approach

The approach to managing this project’s scope is designed to ensure clarity, control, and alignment with stakeholder expectations throughout the project life cycle. The Project Manager (Stanislav Chirikov) will hold the overall authority and responsibility for scope management, while the Project Sponsor (Ministry of Health) will provide final approval for the scope and significant changes. The project team members (also the development team) are responsible for implementing the scope as defined in the project requirements and other stakeholders will provide input and or approve deliverables.

The scope is defined by using key documents, including the Scope Statement, which will outline the project’s characteristics and requirements, deliverables, and success criteria, distinguishing between what is in-scope (real-time wait updates, location-based search, etc.) and out-of-scope (ongoing maintenance, marketing/promotional activities, etc.); the Work Breakdown Structure, which will break the project into manageable phases (e.g., Initiation, Research and Planning, and Development); and the WBS Dictionary, which details each work package. Additionally, the Statement of Work (SOW) will describe the project objectives and timelines.

The Project Manager, Sponsor, and Stakeholders will develop and approve documentation to measure project scope, including quality checklists, scope baseline and work performance measurements. Quality checklists will ensure deliverables meet standards. Scope baseline will be used to compare actual project performance against the planned scope while work performance measurements, such as task completion rates and budget utilization, will monitor progress. In addition, using scope verification will ensure deliverables and reviews are validated against the Scope Statement and WBS.

Any stakeholder can initiate a scope change request by submitting a Change Request form. The form will include details such as the reason for the change, the expected impact, and proposed solution. The Project Manager can then evaluate the impact of the change on the project’s timeline, budget and resources and share it with the Project Sponsor and key stakeholders for approval. Once approved, all changes will be documented, integrated into the project plan, and communicated to all stakeholders. The development team will implement the approved changes as the Project Manager can update all relevant documents. This process will ensure that any scope changes for the project are organized, and disruptions are minimized. Finally, the Project Sponsor (Ministry of Health) is responsible for accepting the final deliverables and project scope.

Overall, this approach will ensure the project delivers a functional yet user-friendly platform that meets stakeholder expectations all the while addressing Ontario’s health care wait-time challenges.

## Roles and Responsibilities

There are several key figures that will all play key roles in managing the scope of this project such as the project sponsor, manager, and developers. Each person must be aware of their responsibilities to ensure that the work performed is within the established scope throughout the entire duration of the project. The table below explicitly defines the roles and responsibilities for the scope management of this project.

**Table 1.1, *Scope Management Roles and Responsibilities***

|  |  |  |
| --- | --- | --- |
| **Name** | **Role** | **Responsibilities** |
| Ministry of Health | Sponsor | * Will approve or deny scope change requests * Evaluate Scope Changes * Accept the project deliverables |
| Stanislav Chirikov | Project Manager | * Oversee the scope definition, verification, and control * Facilitate change control meetings * Update the project documentation upon approval of scope changes |
| Leigh Balite | Frontend Developer | * Design & implement the user interface for X * Integrate the UI components with backend APIs * Ensure design is responsive and user-friendly * Optimize performance and usability |
| Deen Adenowo | QA Tester | * Create and execute test plans * Ensure all functionalities meet requirements * Identify & document bugs * Coordinate with frontend, backend, and database developers to resolve any issues |
| Hamza Teli Jordan Purcell | Backend Developer | * Develop & maintain the server-side code/logic * Create & manage API endpoints * Integrate with external APIs (Google Maps API) * Deploy the application |
| Matthew MacLennan | Database Administrator | * Design & create the project database * Ensure data is securely encrypted * Create automatic backups of all data |

## Scope Definition

Several steps were taken to define the scope for this project and collect requirements for the final product.

Interviews, surveys and panel discussions were conducted among Ontario residents gathering information about their experience using the public healthcare system and mobile and web apps to determine what functionality would be useful and accessible to most users. We gathered information about what devices users use to find healthcare services, how they choose healthcare providers and average wait-times.

Interviews, surveys and panel discussions were conducted, and work observations were made at several hospitals and walk-in clinics across Ontario. We tried to understand current processes and how our final product can be used by healthcare providers to evenly distribute the workload and reduce wait-times. Also, we are looking into requirements for wait-time data gathering.

Consultations were made with officials from the Ministry of Health to learn more about the bigger picture and their input on product requirements. Previous IT projects were also discussed to use past experience to use proven solutions and avoid previous mistakes.

That work allowed us to understand core requirements for the project and design main features of the final product. More details about requirements can be found in Requirements Documentation. Any changes to the requirements can be made in agreement between the Project Team and the Sponsor based on user feedback from testing prototypes, project progression reviews or any significant changes in circumstances affecting the project.

## Project Scope Statement

The MediQ Project will enhance the efficiency of healthcare wait-time tracking by providing real-time updates, improving patient decision-making, and reducing hospital congestion. This scope statement defines the project’s boundaries, deliverables, and acceptance criteria to ensure successful implementation.

**Product Scope Description**

The MediQ Project is a healthcare wait-time tracking system designed to provide real-time hospital and walk-in clinic wait-times, enabling users to make informed decisions about where to seek care. The system will feature location-based search functionalities, user-submitted wait-time reports, and automated updates from healthcare facilities. It aims to improve patient experience, reduce overcrowding, and enhance efficiency in healthcare service delivery.

**Product Acceptance Criteria**

For the project to be accepted as complete, it must meet the following criteria:

* Real-time wait-time updates: Hospitals and walk-in clinics must be able to update their wait-times every three hours.
* User submissions: Users must be able to report wait-times via a mobile-friendly web application.
* Location-based search: Patients should be able to find healthcare facilities with the shortest wait-times within a specified distance.
* System reliability: The platform must be available with 99% uptime during peak hours.
* Data accuracy: Automated data updates from healthcare providers must have at least 95% accuracy.
* User Testing & Validation: The system must pass usability testing with at least 85% positive feedback from test users.
* Stakeholder Approval: The Ministry of Health and the Province of Ontario must formally approve the system before launch.

**Project Management Deliverables**

The following project management deliverables will guide and document the development of the MediQ system from initiation through closure:

* Project Charter: Establishes the formal authorization of the project, outlining objectives, key stakeholders, high-level scope, and initial risks.
* Scope Management Plan: Details how the project scope will be defined, validated, and controlled to ensure alignment with stakeholder needs and prevent scope creep.
* Schedule Management Plan: Provides a framework for developing, managing, and controlling the project schedule, including timelines, milestones, and task dependencies.
* Cost Management Plan: Establishes how project costs will be estimated, budgeted, and monitored to ensure the total budget does not exceed $500,000.
* Quality Management Plan: Describes the approach to ensuring the system meets product acceptance criteria, including uptime, data accuracy, and usability standards.
* Communication Plan: Outlines communication goals, methods, frequencies, and responsibilities to ensure timely and effective stakeholder engagement.
* Risk Management Plan: Identifies potential risks to the project and defines mitigation strategies, risk ownership, and ongoing monitoring procedures.

**Project Deliverables**

The following deliverables will be provided upon project completion:

* A fully functional web-based application for wait-time tracking.
* A mobile-responsive user interface to access the system on smartphones and tablets.
* Backend database to store and retrieve real-time wait-time data.
* Integration APIs for healthcare facilities to update wait-times.
* Admin dashboard for monitoring and managing system data.
* Security and compliance features to ensure patient data privacy.
* User documentation and training materials for healthcare providers.
* System testing and deployment reports.
* Final project report including testing outcomes and user feedback.

**Project Exclusions**

The following activities are outside the scope of this project:

* Ongoing maintenance and support after project launch.
* Integration with private healthcare databases beyond government-regulated facilities.
* Marketing and promotional activities for system adoption.
* Development of a native mobile application (only a mobile-responsive web app will be provided).
* Long-term operational support beyond the initial rollout phase.

**Project Constraints**

The MediQ Project is subject to the following constraints:

* Budget: The project must not exceed $500,000 in total costs.
* Timeframe: The project must be completed within 9 months from the start date.
* Resource availability: Only internal development teams and pre-approved external vendors may be used.
* Regulatory compliance: The system must comply with Ontario’s healthcare data privacy laws.
* Technology limitations: The system must run on the government-approved cloud infrastructure.

**Project Assumptions**

The project is based on the following assumptions:

* The Ministry of Health will provide access to reliable hospital wait-time data.
* Healthcare providers will regularly update their wait-times every three hours.
* Users will actively contribute to wait-time reporting via the mobile interface.
* Sufficient IT and network infrastructure will be available to support real-time updates.
* All stakeholders, including hospitals and clinics, will cooperate in system implementation.

**Work Breakdown Structure**

For WBS please review the Schedule Management Plan

## Scope Verification

Our project plan will outline which requirements will be implemented throughout the project progression. Once the Project Manager decides that deliverables are tested and ready as outlined in the Project Scope Statement and Requirements Documentation, they will be presented to the Sponsor during regular Project Review Meetings. The Ministry of Health representative will accept the deliverables by signing Project Deliverable Acceptance Documents. This will ensure that the project is on the right track in scope, schedule and budget and both the Project Team and the Sponsor have a clear and up-to-date understanding of the project's progress.

## Scope Control

The Project Manager and the Project Team will monitor project progress to make sure all requirements are delivered as outlined in Project Scope Statement, Requirements Documentation and WBS. The Project Team will not implement functionalities that were not outlined in initial documentation without proper change forms. The Project Manager will oversee the Project Team, the project progression and the scope control process.

Any changes to the project scope require a formal procedure. Changes can be proposed by the Project Manager, the Sponsor or any member of the Project Team. A Project Change Request must be submitted to the Project Manager for review and approval. If approved, the request will be reviewed during a change control meeting between the Project Team and the Sponsor to review the change and its possible impact on other scope items, project timeline and budget. If both the Project Manager and the Sponsor approve the Project Change Request, the Project Sponsor will sign off on the Project Change Control Document and the Project Manager will update the project documents and communicate the scope change to the Project Team and other stakeholders.

## Sponsor Acceptance

Approved by the Project Sponsor:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**John Doe**,

Minister, Ministry of Health

Date: February 18, 2025

# Schedule Management Plan

## Introduction

**Purpose**

This Schedule Management Plan’s purpose is to establish clear guidelines for developing, monitoring, and controlling the project schedule. This plan guarantees that all project activities are completed on time, within scope, and aligned with the project objectives. It allows flexibility, iterative progress, and ongoing feedback, making it well-suited for a dynamic project such as creating a web-based application to display real-time hospital and walk-in clinic wait-times in Ontario.

**Scope**

This plan will apply to the entirety of the project lifecycle, from initiation to post-launch. It outlines the methodology, tools, and processes that will be used for creating, maintaining, and managing the project schedule. The plan ensures that all key milestones and deliverables are achieved within the 8-month project timeline. It is structured to support the iterative approach of Agile, enabling modifications to stakeholder feedback and evolving requirements.

**Project Overview**

G1 Solutions’ MediQ project aims to develop a web-based application that provides Ontarians real-time hospital and walk-in clinic wait-times. The project’s key goal is to deliver a user-friendly platform with location-based search functionality, real-time wait-time updates, and integration with healthcare providers for accurate data reporting. The project will be conducted into six phases: Project Initiation, Research and Planning, Design and Prototyping, Development, Testing and Validation, and Post-Launch. The final product is a fully operational web application that satisfies the acceptance criteria specified in the project scope statement.

**Work Breakdown Structure**

To ensure the successful completion of the project, and to manage the scope efficiently, the project is organized into five key phases: Design, Development, Testing, Deployment, and Maintenance. Each phase is then divided into smaller, easier to manage packages. Each package is tied to a clear deliverable, outlining the specific objectives to be delivered.

**A diagram of a company

AI-generated content may be incorrect.**

**Figure 1.1, *Work Breakdown Structure (WBS)***

**Table 1.2, *WBS Dictionary***

Each phase and work package are carefully managed through the project's lifecycle. The WBS Dictionary provides detailed descriptions, deliverables, budget allocation, and assigned resources for each component.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Level | WBS Code | Element Name | Description of Work | Deliverables | Budget in $‘000 | Resources | Start Date | End Date |
| 1 | 1.0 | MediQ | Overall project covering all phases | Fully implemented system | 500 | Full Team | May 14 | Aug 13 |
| 2 | 1.1 | Design Phase | Defining system requirements, architecture, and UI/UX | Design documents, prototypes | 90 | PM, Designers | May 14 | May 21 |
| 3 | 1.1.1 | Requirements Gathering | Identify key features and needs | Requirement specs | 25 | PM | May 14 | May 16 |
| 3 | 1.1.2 | System Architecture | Define system structure and tech stack | Architecture diagrams | 35 | Developers | May 15 | May 21 |
| 3 | 1.1.3 | UI/UX Design | Create wireframes/figma mockups | UI prototypes | 30 | UX/UI Designers | May 16 | May 21 |
| 2 | 1.2 | Development Phase | Writing code for the application | Functional software | 225 | Developers | May 27 | Aug 4 |
| 3 | 1.2.1 | Frontend development | Develop UI | Application UI | 90 | Frontend Developers | May 27 | July 30 |
| 3 | 1.2.2 | Backend development | Develop database/APIs | API endpoints, database schema | 90 | Backend Developers | June 1 | July 30 |
| 3 | 1.2.3 | Integration | Integrate UI and Backend | Integrated system | 45 | Developers, QA | June 6 | July 30 |
| 2 | 1.3 | Testing Phase | Verify performance, and security | Test reports, bug fixes | 85 | Developers, QA | Aug 4 | Aug 11 |
| 3 | 1.3.1 | System testing | End-to-end testing of all features | Test reports | 45 | Developers, QA | July 1 | Aug 9 |
| 3 | 1.3.2 | Security testing & performance test | Ensure system is secure, and scalable | Security audit, load tests | 40 | Security testers, Developers | Aug 9 | Aug 12 |
| 2 | 1.4 | Deployment Phase | Deploy the system | Deployed system | 50 | Full Team | Aug 12 | Aug 13 |
| 2 | 1.5 | Maintenance Phase | Ongoing support and improvements | System updates | 50 | Developers | Ongoing | Ongoing |
| 3 | 1.5.1 | Post-Launch Support | Bug fixes and patches | Bug reports, Patches | 30 | Developers | Ongoing | Ongoing |
| 3 | 1.5.2 | User Feedback & Improvements | Gather user feedback | Feature requests, updates | 20 | Developers | Ongoing | Ongoing |

## Schedule Management Approach

**Methodology**

The project will follow Agile methodology, using the Scrum framework. With its flexible, incremental, and iterative approach, allowing requirements and solutions to evolve using continuous improvement will be an ideal fit for this project. Each phase of the project will be broken down, likely spanning into two-week sprints, during which specific tasks and deliverables are completed. Sprint reviews will be held regularly to evaluate progress and implement any required adjustments.

**Tools and Resources**

* GitHub (Projects/Issues) – For sprint planning, task assignment, issue logging, and tracking progress
* Microsoft Teams – For communication and coordination among team members. It also has a calendar feature, which can be used for scheduling meetings and tracking deadlines.

**Level of Detail**

The schedule will be outlined at the sprint level, each sprint featuring a defined set of tasks and deliverables. The Work Breakdown Structure (WBS) will be utilized to divide the project into manageable components which will be broken down further into tasks for individual sprints. This level of detail will be adequate to ensure all team members are clear on their responsibilities and deadlines, while also maintaining the flexibility needed to adapt to changes and new requirements.

## Schedule Development

The project will follow an Agile approach, ensuring flexibility in development and responsiveness to stakeholder feedback. The timeline will be broken down into two-week sprints, with each sprint focusing on developing, testing, and refining specific features. This iterative methodology reduces risk and allows for continuous adjustments.

* **Work Breakdown Structure (WBS)**: The WBS is structured into major deliverables: Requirements Gathering, System Design, Development, Testing, Deployment, and Post-Launch Monitoring. Each phase is broken into smaller manageable tasks.
* **Task Dependencies**: Dependencies will be documented within the Agile backlog, using tools such as Scrum boards and Sprint planning meetings to ensure smooth workflow transitions. For example, API development must be completed before front end integration can begin.
* **Duration Estimation**: Task durations will be estimated using story points, velocity tracking, and real-time progress monitoring. User stories will be assigned effort levels based on complexity.
* **Milestones**: Key project milestones include:
  + Project Charter Completion (February 11, 2025)
  + Sprint 2: UI/UX Design Completion (May 21, 2025)
  + Sprint 3-5: Backend & Frontend Development Completion (August 4, 2025)
  + Sprint 6-7: Testing & Security Audit Completion (August 12, 2025)
  + Sprint 8: Deployment & Launch (August 13, 2025)
* **Resource Allocation**: Development tasks will be assigned dynamically within each sprint to front-end developers, back-end developers, QA testers, and UX designers. Stand-up meetings will ensure alignment and progress tracking.
* **Baseline Schedule**: The project timeline will be continuously refined based on sprint reviews and stakeholder feedback, allowing for adjustments as needed.

## Schedule Monitoring and Control

The Project Manager and the Project Team will continuously monitor progress to ensure tasks are completed on time and within scope. Since the project follows the waterfall approach, strict adherence to deadlines and phase transitions is crucial.

* **When and How we Monitor Progress:** Progress will be monitored daily using Agile methodology with tools like GitHub for sprint planning. Daily stand-up meetings will track roadblocks and realign priorities.
* **Accuracy of Progress Estimation:** Agile methodologies improve estimation accuracy through burn-down charts, sprint velocity tracking, and retrospective meetings. Adjustments are made at the end of each sprint based on actual vs. expected progress.
* **Measuring Performance in Keeping Up with the Schedule:** Performance will be measured using sprint completion rates, backlog burndown, and cycle time metrics.
* **Reporting Schedule Progress:** Sprint reviews and bi-weekly demos will be conducted to showcase completed work. Reports will be automatically generated in Agile tracking tools.
* **Making Schedule Changes:** Changes are managed dynamically within the product backlog, allowing for feature reprioritization. Mid-sprint changes require approval from the Project Manager.
* Approving Changes: Any backlog adjustments or scope changes will be reviewed in sprint planning meetings, ensuring that changes align with business priorities and team capacity.

## Risk Management

G1 Solutions can work on this project only during a specified time frame - from January to August 2025. All project team members have been assigned to other projects starting September 2025. Thus, it is critical that tasks are completed as scheduled with no or minimal delays. Also, since this project is sponsored by the provincial government, it will be very hard to make any changes to the budget to acquire any additional resources.

At this stage the project team has not identified any measurable risks related to schedule management as all resources required for the project are either fully booked for the whole project duration (talent) or easily available (equipment and software).

There are small risks related to delays from the client in case ministry staff is not available on time for approvals, consultations and training.

Project team came up with several measures that could be implemented to mitigate these risks. Project scope, budget and schedule allocate resources so that the project team had enough time to finish all activities in the given time frame and had some room for manoeuvre.

Project team has regular communications with all stakeholders to make sure no delays are caused by waiting approval or feedback. That communication strategy and clear documentation will help us avoid any misunderstandings about deliverables and minimise changes during planning and development.

In case of any unforeseen circumstances the project team will propose changes to the project scope and budget. Removing non-critical features or getting support from the ministry staff may reduce required time and make the final product cheaper. Increasing budget can also reduce required time by procuring more talent.

Risk Management Plan addresses these risks and their respective mitigation strategies in more detail. The Communications Plan has more information on communicating with the ministry and other stakeholders.

## Performance Measurement

The Project Manager and the Project Team will monitor project progress to make sure the project stays on track. Measurements will be conducted using key performance indicators.

* Schedule Variance: Measures the difference between planned and actual progress.
* Schedule Performance Index: Measures schedule efficiency by comparing work performed to work planned.
* Task Completion Rate: The percentage of tasks compared to planned tasks completed.

Performance metrics will be reviewed bi-weekly. If any major issue occurs, the project manager will escalate the issues to the project sponsor for decision-making.

## Schedule Approval

Approval Process:

* The initial schedule will be reviewed by the project manager and key stakeholders.
* All major schedule changes will require a formal review with the project manager and stakeholders.
* Changes will be judged on impact, feasibility, and priority.

Approval Authority:

* The Project Manager: Responsible for reviewing and approving minor schedule changes.
* Project Sponsor: Approves Major schedule changes affecting the scope, timeline, or budget
* Stakeholders: Consulted for feedback on deliverables.

## Communicating Schedule to Stakeholders

The initial project schedule will be distributed to all stakeholders along with other project documentation. Project team will maintain regular communications with all stakeholders on all important matters including any significant changes to the schedule. In case such changes occur, they will be highlighted through normal commutation channels along with a revised schedule. Minor changes that do not have an impact on milestones and stakeholders' commitments do not have to be communicated. The Communications Plan has more information on this topic.

## Sponsor Acceptance

Approved by the Project Sponsor:

|  |  |  |
| --- | --- | --- |
|  |  | March 5, 2025 |
| **John Doe**,  Minister, Ministry of Health |  | Date |

# Cost Management Plan

## Introduction

The Cost Management Plan outlines the procedures for managing project costs throughout the lifecycle of the project. It establishes the format and standards that will be used for reporting, measuring, and controlling expenses. The plan includes these key components:

* Assign the individual responsible for managing project costs
* Identify who has the authority to approve the project or budget changes
* Describes how cost performance is measured and reported
* Specify the reporting format, frequency, and intended audience

To ensure that the project stays within the approved budget of $500,000, the Cost Management Plan will detail how the project costs will be managed, measured, and controlled throughout the whole project life cycle of MediQ. It will also guarantee that the project aligns with the objectives stated in the Project Charter and Scope Management Plan while defining cost-related roles, reporting formats, and methods to address cost variances.

Cost performance will be quantitatively tracked using Earned Value Management (EVM) metrics, including Schedule Variance (SV), Cost Variance (CV), Schedule Performance Index (SPI), and Cost Performance Index (CPI). These will be highlighted under a “Cost Management” section on the monthly project status reports.

The Project Manager, Stanislav Chirikov, will oversee cost management and report on the project’s cost performance to the Project Sponsor, Ministry of Health, with regular monthly reviews to assess financial progress. Any cost deviations or cost-related issues will be authorized and resolved by the Project Sponsor.

## Cost Management Approach

We chose to create Cost Accounts at the fourth level of the WBS as an example since many project management offices don’t have a Project Management Information System. If you are using a Project Management Information System then you can, and should, manage costs down to the work package level. For those who don’t have a Project Management Information System you’ll want to determine which level of the WBS you can most effectively manage the project’s costs from. The further down in the WBS you go, the more detailed your cost management is. However, you should balance the granularity at which you want to manage costs against the amount of effort it takes to manage at that level. The more granular your cost management, the more work is necessary to manage it.

Costs for this project will be managed at the work package level (Level 3) of the Work Breakdown Structure (WBS). Each work package has been assigned a specific budget allocation as detailed in the WBS Dictionary. Control Accounts (CA) are established for each Level 2 phase (Design, Development, Testing, Deployment, Maintenance), with detailed tracking at the work package level.

Earned Value calculations for the CA’s will measure and manage the financial performance of the project. Although activity cost estimates are detailed in the work packages, the level of accuracy for cost management is at the fourth level of the WBS. Credit for work will be assigned at the work package level. Work started on work packages will grant that work package with 50% credit; whereas the remaining 50% is credited upon completion of all work defined in that work package. Costs may be rounded to the nearest dollar and work hours rounded to the nearest whole hour.

Cost variances of +/- 0.1 in the cost and schedule performance indexes will change the status of the cost to cautionary; as such, those values will be changed to yellow in the project status reports. Cost variances of +/- 0.2 in the cost and schedule performance indexes will change the status of the cost to an alert stage; as such, those values will be changed to red in the project status reports. This will require corrective action from the Project Manager in order to bring the cost and/or schedule performance indexes below the alert level. Corrective actions will require a project change request and must be approved by the Project Sponsor before it can become within the scope of the project.

## Measuring Project Costs

For the MediQ project, costs will be measured and managed using a combination of cost management techniques and Earned Value Management (EVM). This comprehensive approach ensures that we accurately estimate, budget, and control project costs while providing a reliable forecast of future expenditures.

* **Cost Estimation:** To estimate an approximation of the resources required to complete the project we will use a combination of techniques. These include:
  + Top-down estimates: Utilize historical cost data from similar projects found online to form an initial baseline.
  + Bottom-up estimates (summing costs for individual work items): Sum the estimated costs for individual work items and resources. For example, each item or resource cost is identified, estimated, and then aggregated to produce a total project cost.
  + Computerized tools. We will store these estimates on the Microsoft Project.
  + For instance, by gathering cost data from previous healthcare IT projects, we can derive a top-down baseline estimate and then refine it using detailed bottom-up calculations, ensuring our overall estimate is both realistic and data-driven.
* **Cost Budgeting** involves distributing the total estimated project cost across each work item and phase. To achieve this, we will use a structured approach on our Work Breakdown Structure. For example, after obtaining the cost estimate, we will allocate budgets to major phases like design, development, testing, deployment, and maintenance.
  + **Example:**
    - If our total project estimate is $500,000, we might allocate:
    - $90,000 for the design phase (requirements gathering, system architecture, UI/UX design)
    - $225,000 for the development phase (frontend, backend, and integration)
    - $85,000 for testing (system and security testing)
    - $50,000 for deployment
    - $50,000 for maintenance
  + **Implementation:**
    - These allocations will be documented as a time-phased cost baseline in the Microsoft Project, enabling us to monitor spending against each phase and quickly identify any variances.
* **Cost Control:** is the process of monitoring expenditure and ensuring that actual spending remains aligned with the budget. To achieve this, we will use Earned Value Management (EVM) like the Cost Performance Index and Schedule Performance Index (SPI) to monitor cost efficiency. For example, if the CPI drops below 0.9, that means we are spending more than was initially planned. Below is an example of the metrics we will be using:
  + **Schedule Variance (SV):**
    - SV = EV – PV
    - Indicates whether the project is ahead or behind schedule. A zero SV means the project is exactly on schedule.
  + **Cost Variance (CV):**
    - CV = EV – AC
    - Reflects whether the project is under or over budget. A positive CV suggests being under budget, while a negative CV indicates being over budget.
  + **Schedule Performance Index (SPI):**
    - SPI = EV / PV
    - Measures schedule efficiency; an SPI close to 1 indicates that progress is nearly on schedule.
  + **Cost Performance Index (CPI):**
    - CPI = EV / AC
    - Measures cost efficiency; a CPI of 1 indicates spending exactly as planned. If the CPI drops below 0.9, for example, it signals that we are spending more than planned for the work completed, triggering a review.

The performance of the project will be measured using Earned Value Management. The following four Earned Value metrics will be used to measure projects cost performance:

* Schedule Variance (SV)
* Cost Variance (CV)
* Schedule Performance Index (SPI)
* Cost Performance Index (CPI)

If the Schedule Performance Index or Cost Performance Index has a variance of between 0.1 and 0.2 the Project Manager must report the reason for the exception. If the SPI or CPI has a variance of greater than 0.2 the Project Manager must report the reason for the exception and provide management with a detailed corrective plan to bring the project's performance back to acceptable levels.

|  |  |  |
| --- | --- | --- |
| **Performance Measure** | **Yellow** | **Red** |
| Schedule Performance Index (SPI) | Between 0.9 and 0.8 or Between 1.1 and 1.2 | Less Than 0.8 or Greater than 1.2 |
| Cost Performance Index (CPI) | Between 0.9 and 0.8 or Between 1.1 and 1.2 | Less Than 0.8 or Greater than 1.2 |

## WBS-Based Budget Allocation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **WBS Code** | **Element Name** | **Budget** | **Duration (Weeks)** | **Start Date** | **End Date** | **Assigned Resources** |
| **1.0** | **MediQ Project** | $500K | 17 | May 14, 2025 | Aug 13, 2025 | Full Team |
| **1.1** | **Design Phase** | $90K | 3 | May 14 | May 21 | PM, UX/UI Designers |
| 1.1.1 | Requirements Gathering | $25K | 1 | May 14 | May 16 | PM |
| 1.1.2 | System Architecture | $35K | 1 | May 15 | May 21 | Backend Developers |
| 1.1.3 | UI/UX Design | $30K | 1 | May 16 | May 21 | Ux/UI Designers |
| **1.2** | **Development Phase** | $225K | 7 | May 27 | Aug 4 | Frontend/Backend Developers |
| 1.2.1 | Frontend Developers | $90K | 3 | May 27 | July 30 | Frontend Developers |
| 1.2.2 | Backend Development | $90K | 3 | June 1 | July 30 | Backend Developers |
| 1.2.3 | Integration | $45K | 1 | June 6 | July 30 | Full Dev Team + QA |
| **1.3** | **Testing Phase** | $85K | 3 | Aug 4 | Aug 11 | QA Team + Developers |
| 1.3.1 | System Testing | $45K | 2 | July 1 | Aug 9 | QA Team |
| 1.3.2 | Security & Performance Test | $40K | 1 | Aug 9 | Aug 12 | Security Testers |
| **1.4** | **Deployment Phase** | $50K | 1 | Aug 12 | Aug 13 | Full Team |
| **1.5** | **Maintenance Phase** | $50K | Ongoing | Aug 15 | Ongoing | Developers |

## Reporting Format

Cost performance will be tracked in the monthly project status reports. Within the report, under a section called “Cost Management”, it will detail an overview of the Earned Value Metrics including SV, CV, SPI, and CPI. It will also highlight any cost variances that exceed defined thresholds, outline corrective actions planned or implemented to address budget deviations, and document any approved change requests impacting the project budget. This approach will ensure cost performance is transparent and effectively managed throughout the project's life cycle.

## Cost Variance Response Process

The Control Thresholds for this project are a CPI or SPI of less than 0.8 or greater than 1.2. If the project reaches one of these Control Thresholds, the project manager will perform the following steps:

* **Step 1.** Present the Project Sponsor with a Cost Variance Corrective Action Plan within 5 business days from the initial report of the CPO or SPI. These actions include increasing the project budget, reducing project scope or quality, or some other measures to realign the costs with the approved budget.
* **Step 2**. Develop & submit a formal Cost Variance Corrective Action Plan within three business days, from when the Project Sponsor selects a corrective action option. The Cost Variance Corrective Action Plan will detail the actions necessary to bring the project back within budget and how the effectiveness of the actions in the plan will be measured.
* **Step 3.** Review & acceptance of Cost Variance Corrective Action Plan by Project Sponsor.
* **Step 4**. Integrate Cost Variance Corrective Action into project plan to reflect the corrective actions.

## Cost Change Control Process

Cost changes occur when new requirements, unforeseen circumstances, or cost overruns necessitate an adjustment to the original budget. The Cost Change Control Process ensures that all changes are properly evaluated, approved, and integrated into the project plan.

**Steps for Cost Change Control**

1. **Identify Cost Variance or Required Change**
   1. Any potential cost changes, whether due to scope adjustments, resource fluctuations, or unforeseen expenses, must be identified and documented.
   2. The Project Manager will initiate a Cost Change Request (CCR) to formalize the proposed adjustment.
2. **Impact Assessment**
   1. The Project Manager and Finance Team will assess the financial implications of the proposed cost change, including:
      1. Effect on total project cost.
      2. Impact on project schedule and resource allocation.
      3. Potential risks associated with the change.
   2. A revised Cost Forecast Report will be prepared and submitted for review.
3. **Submission of Cost Change Request (CCR)**
   1. The Project Manager will submit the CCR to the Project Sponsor for approval.
   2. The request will include:
      1. Justification for the cost change.
      2. Breakdown of revised budget allocation.
      3. Mitigation strategies to minimize impact.
4. **Approval Process**
   1. The Project Sponsor will review the CCR and determine whether to approve, reject, or modify the request.
   2. If the cost change exceeds 10% of the total budget, additional approvals may be required from executive stakeholders.
   3. Approved changes will be documented in the Change Log.
5. **Implementation and Budget Update**
   1. Upon approval, the Finance Team will update the project budget and adjust cost baselines accordingly.
   2. The changes will be communicated to all relevant teams and reflected in the project management tools (e.g., Microsoft Project, GitHub, or Jira).
6. **Ongoing Monitoring and Reporting**
   1. The Project Manager will ensure that any cost changes are continuously monitored.
   2. Monthly reports will include details on cost performance, highlighting any deviations from the revised budget.

**Cost Change Control Approval Authority**

|  |  |
| --- | --- |
| **Cost Change Amount** | **Approval Authority** |
| < 5% of budget | Project Manager |
| 5% - 10% of budget | Project Sponsor |
| > 10% of budget | Executive Stakeholders |

This structured approach ensures that all cost changes are controlled, justified, and approved, minimizing financial risks while maintaining project feasibility.

## Project Budget

All work for this project will be performed by a team of 6 project team members who will assume roles of developers, PMO and QA.

**Monthly Recurring Expenses**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cost Type** | **WBS Reference** | **Monthly Rate** | **Quantity** | **Total Monthly Cost** | **Duration (Months)** | **Grand Total Amount** |
| Software Developers | 1.2.1, 1.2.2 | $8,000 | 5 | $40,000 | 8 | $320,000 |
| Project Manager | All WBS items | $10,000 | 1 | $10,000 | 8 | $80,000 |
| Infrastructure & Cloud Services - Planning phase | 1.1 | $1,000 | 1 | $1,000 | 4 | $4,000 |
| Infrastructure & Cloud Services - Execution phase | 1.2, 1.3 | $5,000 | 1 | $5,000 | 4 | $20,000 |
| **Total** |  |  |  |  |  | **$424,000** |

**Non-monthly Recurring Expenses**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cost Type** | **WBS Reference** | **Fixed Rate** | **Quantity** | **Amount** |
| Hardware | 1.2 | $2,500 | 6 | $15,000 |
| Software | 1.2 | $2,500 | 6 | $15,000 |
| Contingency Reserve (10%) | All EBS Items | $46,000 | 1 | $46,000 |
| **Total** |  |  |  | **$76,000** |

**Project total: $500 000**

Sponsor Acceptance

Approved by the Project Sponsor:

|  |  |  |
| --- | --- | --- |
|  |  | March 11, 2025 |
| **John Doe**,  Minister, Ministry of Health |  | Date |

# Quality Management Plan

## Purpose

This plan defines the processes, standards, and responsibilities necessary to ensure that the project meets its quality objectives. It provides guidelines for testing, and issue tracking to improve the system’s performance, security, and user satisfaction. The scope of this document includes testing methods, issue resolution steps, and compliance with industry standards.

## References

* MediQ Project Charter
* MediQ Scope Management Plan
* MediQ Project requirements
* ISO/IEC 25010:2023

## Roles & Responsibilities

|  |  |  |
| --- | --- | --- |
| **Name** | **Role** | **Responsibilities** |
| Ministry of Health | Sponsor | * Approves changes to the scope, budget or schedule when required to fix quality issues * Reviews and approves QA and user acceptance tests results |
| Stanislav Chirikov | Project Manager | * Monitors issues log and test results * Assigns issues priorities * Requests changes to the scope, budget or schedule when required to fix quality issues * Reviews QA and user acceptance tests results and presents them to the sponsor for approval |
| Leigh Balite, Hamza Teli, Jordan Purcell, Matthew MacLennan | Development Team | * Develop product according to project requirements * Perform unit, integration and system tests at each stage of development * Prepare technical documentation and training materials * Assist, monitor and review QA and user acceptance tests * Identify and document bugs * Resolve any technical issues |
| Deen Adenowo | QA Tester | * Creates and executes test plans and scripts * Prepares and oversees user acceptance tests * Ensures all functionalities meet requirements * Identifies and documents bugs * Coordinates with frontend, backend, and database developers to resolve any issues * Presents tests results to the project manager for review |

## Quality Metrics

|  |  |  |
| --- | --- | --- |
| **Metric** | **Target** | **Method** |
| Load Time | Maximum 5 seconds for search results | Measured through performance testing |
| Data Accuracy | Reported wait-times accuracy of 85% minimum | Verified with simulated tests |
| Uptime | 99.9% uptime | Use existing vetted cloud infrastructure such as Azure |
| Accessibility Compliance | Minimum 70% compliance | Verified via accessibility documentation and checklists |

## Quality Standards

The MediQ system is a healthcare-focused web application designed to provide Ontarians with real-time hospital and clinic wait-times. Due to its critical role, the system must adhere to high-quality standards to ensure reliability, security, and performance.

To meet these quality standards, the MediQ system will align with ISO 25010 guidelines, which provides a framework for evaluating and improving software quality. It covers sections such as functionality, efficiency, reliability, usability, security, maintainability, and portability.

In addition, the system will also comply with AODA (Accessibility for Ontarians with Disabilities Act) standards. This ensures that people with disabilities can use our system with ease.

By adopting such standards, MediQ will be a secure, efficient, and user-friendly application that meets the healthcare needs of Ontarians.

## Quality Methods

To ensure the MediQ project meets its quality objectives, a structured approach to quality assurance will be implemented. The following methods will be applied throughout the project:

1. Issue Logging & Tracking

* A GitHub-based issue log will track all identified bugs, system failures, and enhancement requests.
* Issues will be classified by severity: Critical (system failure), Major (feature impact), Minor (UI/UX glitches).
* Real-time monitoring tools will be used to detect system crashes, slow response times, and error logs.

1. Unit Testing

* Developers will conduct unit testing after completing each module.
* Tests will validate code functionality, ensure proper integration with APIs, and identify edge-case failures.
* Automated test scripts will be implemented for repetitive testing.

1. Integration Testing

* Conducted at the end of every sprint to ensure individual components work together correctly.
* Backend API integration with frontend UI and database interactions will be validated.
* All endpoints will be tested for response time, error handling, and security vulnerabilities.

1. System Testing

* Comprehensive testing at key milestones to evaluate overall system performance.
* Includes load testing, stress testing, security testing, and compliance testing.
* Simulated high-traffic loads will test system stability and resilience.

1. User Acceptance Testing (UAT)

* UAT will be performed in the final sprint before deployment.
* Ministry of Health stakeholders and select end users will participate in structured test scenarios.
* UAT will validate real-world use cases and overall user experience.

1. Regression Testing

* Regression testing will ensure that new code deployments do not break existing functionalities.
* Conducted before major feature releases or patches.

1. Documentation & Training

* Technical documentation will be maintained to record test cases, system architecture, and troubleshooting procedures.
* Training materials will be prepared for users to ensure smooth adoption of the system.

1. Compliance & Security Testing

* Application security audits will be conducted to ensure compliance with ISO 25010.
* Data protection best practices will be followed to maintain confidentiality and security.

Achieving Compliance:

* Define Quality Objectives: Set clear performance and security benchmarks.
* Implement Secure Development Practices: Follow best practices for data security.
* Adopt a Quality Management System (QMS): Use structured testing and tracking tools.
* Perform Regular Testing: Continuous validation throughout development.
* Conduct Audits & Reviews: Stakeholder and expert evaluations to ensure compliance.

**Quality Management Activities**

To ensure an effective execution of the quality standards and methods we defined in this plan, G1 Solutions will perform the following quality management activities throughout the project lifecycle:

1. **Quality Planning & Kick-off:**
   1. Kick-off meeting: When the project starts, conduct a kick-off meeting with all stakeholders to review quality objectives, roles, timelines, and deliverables
   2. Quality Plan Review: Establish clear quality objectives that align with project goals and schedule regular checkpoints to review the progress and make any updates to the Quality Management Plan if need be.
2. **Quality Assurance (QA):**
   1. Daily Standups: Brief daily meetings will be incorporated to review ongoing issues, provide updates, track progress, and discuss risks
   2. Regular QA Reviews: We will schedule weekly reviews to assess progress on QA activities such as code reviews, documentation checks, and test plan validations
   3. Compliance Audit: Perform an audit to determine if our system meets regulations
3. **Quality Control (QC) Measures:**
   1. Automated monitoring: Utilize real-time monitoring tools in our cloud provider to track system performance
   2. Issue Tracking & Reporting: will be completed and tracked via GitHub Issues
4. **Continuous Improvement:** 
   1. Sprint Retrospective: After each sprint, we will hold a very brief meeting to identify lessons learned, the challenges we faced, and discuss how we can improve in the next sprint
   2. Refine Process: Regularly update QA testing procedures, and documentation based on feedback from team and performance metrics
5. **Training & Awareness:**
   1. Knowledge Sharing Sessions: Host knowledge-sharing sessions to ensure all team members are aware of the tools, technologies being used, and security standards

## Problems Reporting & Corrective Action Process

Issues are first identified through various methods including testing, users feedback, system monitoring, and stakeholder input. These issues will be promptly logged into GitHub, the project’s issue tracking tool, and categorized by severity: critical (system crashes, data loss), major (significant functionality impact), or minor (minimal impact).

The Project Manager, Stanislav Chirikov, will prioritize and assign most issues to the appropriate team members based on the issue’s nature. The Project Manager will determine whether these issues will require change requests or if they can be resolved within the current sprint. Any issues that cannot be resolved within the current sprint or that require additional resources are escalated to the Project Sponsor, Ministry of Health.

Critical issues will require immediate action and escalation to the Project Manager to mitigate the impact. This may include rolling back a release, applying a temporary fix, or escalating the issue. A permanent fix will be developed shortly for a resolution. Depending on the severity, the fix will be implemented in the next sprint or as part of a hotfix. Fixes will undergo various testing, including regression and staging environment checks, to confirm and ensure the issue is resolved without causing new problems. Once resolved, the issue will be marked completed from the issue log. The Project Manager will further communicate statuses of critical and major issues to the Project Sponsor.

All issues and corrective actions are thoroughly documented and reviewed in sprint retrospective to identify lessons learned and prevent similar issues in the future. To also ensure continuous improvement, feedback from stakeholders and end users will be consistently collected and used to refine the system. The Problem Reporting and Corrective Action Process will undergo regular reviews and updates to maintain efficiency.

## Supplier Quality & Control

Supplier quality and control ensure that all external vendors and suppliers contributing to the MediQ project meet predefined standards and expectations. Suppliers must deliver services or hardware components that align with the project`s technical requirements, timelines, and budget constraints.

Key Factors:

* Supplier Selection Criteria: Vendors are evaluated based on experience, technical expertise, past performance, reliability, and compliance with healthcare data privacy regulations.
* Quality Agreements: Each supplier will sign a formal quality agreement defining quality expectations, delivery timelines, communication protocols, and deviation or escalation procedures.
* Performance Monitoring: Supplier performance will be continuously monitored through regular reviews, audits, and milestone-based evaluations. Any deviations will trigger corrective actions.
* Compliance Audits: Periodic compliance checks ensure that suppliers adhere to data protection standards and contractual obligations.
* Issue Escalation and Resolution: Any quality concerns will be documented and escalated promptly to the project manager and procurement lead for swift resolution.
* Supplier Reviews: Quarterly performance reviews will be conducted with key suppliers to evaluate service delivery, gather feedback, and identify opportunities for improvement.

## Sponsor Acceptance

I hereby confirm that I have reviewed and approved the Quality Management Plan for the MediQ Project, including all attachments and referenced documents.

Approved by the Project Sponsor:

|  |  |  |
| --- | --- | --- |
|  |  | March 18, 2025 |
| **John Doe**,  Minister, Ministry of Health |  | Date |

# Communication Management Plan

## Purpose

The key to success in any project is effective communication. The Communication Management Plan ensures that all stakeholders will remain informed, aligned, and engaged throughout the entirety of the project lifecycle. The plan defines the communication objectives, such as facilitating real-time updates on hospitals or walk-in clinic wait-times, system performance, and data privacy compliance. It also outlines the roles and responsibilities of stakeholders to maintain clarity and accountability, specifying the reports, communications, and updates they must provide, along with their frequency.

It clarifies who escalates issues and gathers feedback, ensuring that the right information reaches the appropriate team efficiently and in a timely manner. Additionally, the plan establishes a step-by-step process to mitigate disruptions by addressing critical risks, bugs, and delays.

By following this plan, the project team aims to minimize misunderstandings, keep the stakeholders engaged, and ensure the MediQ platform meets its goal of improving healthcare access in Ontario.

## Definitions, Abbreviations, Acronyms

| Term | Definition |
| --- | --- |
| Application | The software component of the system |
| Software | An electronic program consisting of algorithms, control logic, data structures, data sets, operating system, and user interface. Software may consist of critical and non-critical components and may be used as a part or as an accessory of a medical device to perform pre-defined and approved operations on medical devices. Software itself may be a medical device. Software may be used in the production of a device (e.g. programmable logic controllers used in the manufacturing of equipment). Software may be used in the implementation of the device manufacturer’s quality system (e.g. Software that records and maintains the device history record. |
| SOP | Standard Operating Procedure |
| MediQ | The web-based application that provides real-time wait-times for hospitals and walk-in clinics in Ontario. |
| Wait-time | The interval between patient check-in and consultation |
| API | Application Programming Interface, used to integrate wait-time data from healthcare organizations and third-party sources. |
| UI | User Interface (UI) is the graphical layout in which users will interact with MediQ application. |
| User Experience (UX) | The overall experience of users when interacting with MediQ. It covers usability and accessibility of the application design. |
| Agile | A project management approach based on iterative development. |
| Sprint | A short, time-boxed period where specific tasks and deliverables are completed in Agile projects. |
| Quality Assurance (QA) | The systematic process of verifying that the MediQ application meets the standards and functions correctly before deploying. QA includes testing the application for bugs and performance. |
| Stakeholder | Any individual or organization whether internal or external with an interest or impact on the project. This can include end users, healthcare providers, regulatory bodies, and internal team members. |
| Change Request | A proposal to modify any aspect of the project scope, budget, or timeline that must go through the defined approval process |

## References

* MediQ Project Management Plan - Reference as per organization standards
* Accessibility for Ontarians with Disabilities Act (AODA). *Information is available via* [*https://www.ontario.ca/page/accessibility-in-ontario*](https://www.ontario.ca/page/accessibility-in-ontario)
* Personal Health Information Protection Act (PHIPA). *A key regulation for handling healthcare data in Ontario.*
* Google Maps Platform Documentation. *Accessible via* [*https://developers.google.com/maps/documentation*](https://developers.google.com/maps/documentation)
* Leaflet Maps Documentation. *Accessible via* [*https://leafletjs.com/reference.html*](https://leafletjs.com/reference.html)

## Stakeholder communications requirements

Each stakeholder group has distinct communication needs to facilitate smooth project execution and ensure timely updates.

**Communication Objectives:**

i) Ensure transparent, structured, and timely communication across all stakeholders.

ii) Facilitate real-time updates on hospital wait-times, system performance, and data privacy compliance.

iii) Provide a structured approach to resolving errors, delays, and risks.

iv) Establish a feedback loop for continuous improvements in development, design, and outreach.

## Communications Matrix & Responsibilities

This communication matrix outlines how communication will be managed between all the stakeholders of the project.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Communication Type** | **Purpose** | **Audience** | **Frequency** | **Format / Medium** | **Information Communicated** | **Owner** |
| **Project Kickoff Meeting** | Formally launch the project; set expectations, clarify roles, and confirm objectives. | Sponsor (Ministry of Health), PM, Dev Team, QA, SMEs | Once at project start | In-person or virtual meeting | - Project scope & objectives  - Key milestones  - Team roles & responsibilities  - Communication protocols | Project Manager (PM) |
| **Weekly Status Report** | Provide brief updates on progress, tasks completed, next steps, and any blockers. | Sponsor, PM Dev Team, QA, Key SMEs | Weekly (Every Friday) | Email / PDF or Word doc | - Completed tasks  - Work in progress  - Upcoming tasks  - Risks & issues  - Earned Value Metrics (optional) | PM collects input from Dev Team |
| **Sprint Review & Demo** | Demonstrate completed features; gather feedback for iterative improvement. | PM, Dev Team, QA, Sponsor (as needed) | End of every 2-week sprint | Virtual meeting (Zoom/Teams), recorded if needed | - Demonstration of completed user stories  - Stakeholder feedback  - Updated product backlog | Dev Team / Scrum Master |
| **Monthly Steering Committee Meeting** | Discuss high-level progress, budget status, and major risks or changes requiring sponsor decisions. | Sponsor (Ministry of Health), PM, possibly Execs | Monthly | In-person / Virtual | - Financial & schedule overview  - Major risks/roadblocks  - Scope changes or approvals  - Resource needs | PM |
| **Risk Review Session** | Identify and reassess project risks; decide on mitigation steps or escalations. | PM, Dev Leads, QA | Monthly or As Needed | Virtual meeting (Zoom / Teams) | - Updated Risk Register  - Probability & impact scores  - Mitigation/contingency actions  - Owner & due dates | PM |
| **Ad-Hoc Requirements Clarification** | Resolve questions about requirements or design details quickly. | Dev Team, QA, SME (Healthcare orgs) | As Needed | Email / Slack / Quick Call | - Clarifications on acceptance criteria  - Data exchange formats  - Minor scope refinements | Lead Developer or QA |
| **Executive Update Report** | Summarize the project’s strategic alignment, budget usage, and significant achievements for executive stakeholders. | Sponsor’s Executive Stakeholders | Quarterly or As Needed | Slide deck (PowerPoint) | - Budget usage vs. plan  - Major milestones reached  - ROI projections or strategic fit  - Key challenges & mitigations | PM with Sponsor’s input |
| **User Communications** | Notify public users about new features, updates, or planned downtime. | Ontario public (end-users) | As Needed (version releases) | Web announcements / Email list / social media | - New feature announcements  - Scheduled maintenance windows  - Changelog or release notes | Dev Team (Frontend / PM) |

## Comments & Guidelines

There are a few important comments and guidelines to adhere to which are detailed below.

1. **Communication Etiquette:** All communication must be clear, concise, and professional. Email communications must be responded to within 24 hours, and more urgent messages via slack should be acknowledged within 2 hours during business hours.
2. **Meeting Best Practices:** All meetings must have an agenda attached to each invite. Each meeting must have notes, and the next actions compiled.
3. **Documentation:** All documentation will be stored in a shared repository in the cloud. This includes meeting minutes, and updates.

## Escalation procedures for resolving issues

To maintain project efficiency, all issues must be escalated systematically based on their severity and impact.

|  |  |  |  |
| --- | --- | --- | --- |
| **Severity Level** | **Description** | **Resolution Timeline** | **Escalation Level** |
| **Critical (P1)** | System outage, data loss, security breach. | Immediately (within 4 hours). | Escalate to Project Manager, Development Lead, and QA Lead. |
| **High (P2)** | Major bug(glitch) affecting hospital wait-time updates, app crashes. | Within 24 hours. | Escalate to Development Lead and QA Team. |
| **Medium (P3)** | UI/UX issues, performance slowdowns, non-critical bugs. | Within 3-5 days. | Escalate to the Development Team. |
| **Low (P4)** | Minor usability issues, design feedback. | Within 7 days. | Escalate to UX Lead. |

**Escalation Pathway**

Step 1: Initial Reporting

* Reporter:Any team member, stakeholder, or user reports an issue via Slack, GitHub, JIRA, and or email.
* Assigned Team: The issue is assigned to the relevant team (Development, UX, QA, or Business).

Step 2: Internal Review & Resolution

* Development Team: Fixes coding errors, API failures, or performance issues
* QA Team: Tests, fixes and verifies bug resolution.
* UX Team: Adjusts design flaws or accessibility concerns.

Step 3: Escalation to Project Leadership

* If not resolved within the designated timeline, the issue is escalated to the Project Manager and relevant department heads.
* Critical issues (**P1, P2**) require immediate resolution and communication with the sponsor if they impact project timelines or budget.

Step 4: External Escalation (if required)

* Legal Escalation: If the issue relates to data privacy, compliance, or legal risk, the Legal Consultant is involved.
* Business Escalation: If the issue affects API integration with external partners, the Business Partner & Project Manager engages directly.
* Public Escalation: If a major issue (e.g., inaccurate hospital wait-times) is raised by users, the Survey & Outreach Team coordinates public messaging.

## Revision procedures

To ensure continuous improvement, the MediQ project communication plan and development processes must be revised periodically.

**Revision Triggers:**

* Major project milestones reached (e.g., Beta testing, product launch).
* Stakeholder feedback suggests inefficiencies in communication or issue resolution.
* New risks, technologies, or compliance requirements emerge.
* Persistent escalation of issues beyond expected resolution timelines.

**Revision Process:**

|  |  |  |
| --- | --- | --- |
| **Step** | **Action** | **Responsible Party** |
| 1. Review Communication Logs | Analyze project reports, meeting minutes, and issue logs. | Project Manager |
| 2. Gather Stakeholder Feedback | Conduct surveys or meetings with teams and external partners. | Outreach Lead |
| 3. Identify Gaps & Inefficiencies | Assess communication delays, unresolved issues, or missing escalation steps. | Development & QA Leads |
| 4. Implement Changes | Update communication matrix, escalation policies, and documentation. | Project Manager |
| 5. Notify All Stakeholders | Share the revised communication plan via email and meetings | Project Manager |

# Risk Management Plan

## Purpose

MediQ will become a modern application that will be serving thousands of users across Ontario daily. Implementation of any project of this scale requires significant resources, time and talent and involves many risks and uncertainties that must be addressed as they arise. If not properly controlled, risks can jeopardies the entire project or cause a great impact on its budget, scope and schedule. Effective project risk management is required to avoid this, which in turn requires a detailed plan prepared before the product development starts.

Historically, project risk management was one of the most overlooked parts of project management in many fields including IT. Our team believes that best practices lead to higher project success rates, thus it is essential to have a proper risk management plan prepared. This document will address any risks the project team can foresee, methods used to identify those risks and strategies that will be used to manage them.

Since this is a not-for-profit project, we do not anticipate any positive risks, so most emphasis will be on identifying, quantifying, analyzing and preventing any risks or minimizing their impact on project success. We will also discuss methods and tools (including software) that will be used to control those risks.

## Roles & Responsibilities

|  |  |  |
| --- | --- | --- |
| Name | Role | Responsibilities |
| John Doe - Project Sponsor | Executive Oversight | * Approves the Risk Management Plan and any major risk-response funding * Provides direction on risk tolerance and escalation thresholds * Makes go/no-go decisions on high-impact risks |
| Stanislav Chirikov - Project Manager | Risk Owner & Facilitator | * Leads all risk-management activities and owns the Risk Register * Chairs monthly risk-review meetings and ad-hoc escalations * Ensures risk responses are integrated into scope, schedule, and budget baselines |
| Deen Adenowo - QA / Lead | Quality-Related Risk Owner | * Identifies testing and defect-related risks (e.g., performance, security) * Tracks mitigation tasks (automated tests, penetration tests, etc.) * Reports residual quality risks to the PM |
| Leigh Balite - Front-End Dev Lead | Technical Risk Owner  (UI/UX) | * Flags UI/UX feasibility or third-party API risks (Google Maps, auth SDKs) * Owns mitigations such as fallback libraries or design simplifications |
| Hamza Teli & Jordan Purcell - Back-End Dev Leads | Technical Risk Owners (API & Data) | * Identify server-side, data integrity, and scalability risks * Implement mitigations (rate limiting, DB indexing, cloud auto-scaling) |
| Matthew MacLennan - DBA / DevOps | Infrastructure Risk Owner | * Monitors cloud cost, availability, and backup/restore risks * Maintains DR scripts, automated backups, and uptime dashboards |
| Ministry of Health SME | Business Stakeholder | * Highlights policy, compliance, and privacy risks * Reviews risk responses that affect regulatory alignment |
| All Team Members | Risk Contributors | * Proactively log new risks in jira “Risk” issue type * Execute assigned response actions and update status weekly |

## Risk Management Procedures

1. **Risk Planning**
   1. Approve this Risk Management Plan during project initiation.
   2. Define probability/impact scales (1-5) and an overall Risk Exposure score (P x I).
   3. Set escalation thresholds: any risk with Exposure > 15 goes to Sponsor review.
2. **Risk Identification**
   1. Hold a Kick-off Risk Workshop using brainstorming, checklists (PMBOK, ISO 27005), and SWOT analysis.
   2. Continuously capture new risks in a Risk Register (maintained in Jira). Each entry gets a unique ID, date, description, category, and initial owner.
3. **Qualitative Analysis**
   1. Every sprint, team members estimate Probability (1-5) and Impact (1-5).
   2. Plot risks on a 5x5 heat map; categorize as High (>15), Medium (8-14), or Low (<7).
   3. Update risk status (Open, Mitigated, Transferred, Accepted, Closed).
4. **Quantitative Analysis (High Risks Only)**
   1. For Exposure > 15, perform Expected Monetary Value (EMV) or PERT schedule impact.
   2. Use Monte Carlo simulation in Excel to model cumulative schedule slippage if >3 high risks materialize.
5. **Response Planning**
   1. Select one strategy per risk: Avoid, Mitigate, Transfer, Accept, or Exploit (positive risks).
   2. Document concrete actions, budget, and trigger conditions.
   3. Assign an Action Owner and Target Date in the Risk Register.
6. **Implementation & Monitoring**
   1. Embed response tasks into the Sprint Backlog with story points and due dates.
   2. Tracks completion in daily stand-ups; PM reviews risk burndown each Friday.
   3. Re-evaluate probability/impact after each sprint demo, update residual risk
7. **Escalation & Reporting**
   1. If a risk crosses its trigger (e.g., CPI < 0.8 or data-breach incident), the PM calls an Emergency Risk Meeting within 24 hours.
   2. Include a Risk Section in the bi-weekly status report: top 5 open risks, trend arrows, and newly closed items.
8. **Lessons Learned & Closure**
   1. Upon project close-out, conduct a Risk Retrospective to capture successful mitigations and failed assumptions.
   2. Archive the final Risk Register in the project repository and feed lessons into the organization’s risk knowledge base.

## Risk Management Deliverables

Below is a list of risk management deliverables for the MediQ project, including definitions and purpose of each item:

|  |  |  |
| --- | --- | --- |
| **Risk Deliverables** | **Definition** | **Purpose** |
| Risk Management Plan | A comprehensive document defining how risks will be identified, analyzed, responded to, and monitored. Includes methodology, roles/responsibilities, and risk thresholds. | Provides the framework for all risk management activities and ensures a consistent approach across the project team. |
| Risk Register | A centralized log (maintained in Jira) that tracks all identified risks with details including:   * ID, description, owner * Probability (1-5), Impact (1-5), Exposure (PxI) * Response Strategy (Avoid/Mitigate/Transfer/Accept) * Status (Open/Mitigated/Closed)   Updated continuously throughout the project. | Central repository for risk information that enables tracking and ensures no risks are overlooked. Provides visibility to all stakeholders. |
| Probability Impact Matrix | A 5x5 grid categorizing risks by severity:   * High (Red): Exposure 15-25 * Medium (Yellow): Exposure 8-14 * Low (Green): Exposure 1-7 | Visual tool to prioritize risks and guide response planning. Helps focus attention on the most critical risks that require immediate action. |
| Risk Breakdown Structure | Hierarchical representation of risk categories:   * Technical (API failures, data accuracy) * Schedule (delays in approvals) * Compliance (AODA/PHIPA violations * Stakeholder (healthcare provider cooperation) * Security (data breaches) | Helps systematically identify risks by category and ensures comprehensive coverage of all potential risk areas. |
| Risk Response Plans | Detailed action plans for high-priority risks (Exposure >15) including:   * Avoidance: changing plans to eliminate risk * Mitigation: reducing probability/impact * Transfer: shifting risk to third party (outsource) * Acceptance: Passive (monitoring) or active (contingency reserves) | Provides clear guidance on how to address specific risks when they occur or are about to occur. Ensures preparedness and reduces response time. |
| Risk Reports | Regular reports (bi-weekly) including:   * Top 5 current risks * Recently closed risks * Risk exposure trends * Effectiveness of response actions * Newly identified risks   Distributed to project team and stakeholders via project status updates. | Keeps stakeholders informed about risk status and demonstrates proactive risk management. Supports data-driven decision making. |
| Contingency Plans | Pre-approved backup plans for high-impact risks, including:   * Alternate API providers (if Google Maps fails) * Additional budget allocation process * Extended testing timeline procedures * Data recovery protocols | Enables quick response to materialized risks without requiring lengthy approval processes during crises. |
| Risk Audit Reports | Periodic evaluations (monthly) of:   * Risk process effectiveness * Accuracy of probability/impact assessments * Completeness of risk identification * Proper implementation of response plans   Conducted by QA lead with findings reported to project manager. | Provides quality control for risk management activities and identifies opportunities for improvement in the risk management process. |
| Lessons Learned | Document created at project closure capturing:   * Most significant risks encountered * Effectiveness of response strategies * Unanticipated risks * Recommendations for future projects | Helps improve risk management practices for future projects by learning from actual experiences. |

## Risk Probability, Impact, Criteria

For both probability and impact categories, we will utilize a 5-point scale. Please see the sections below for a more thorough definition and explanation of each. In addition, the third table summarizes the acceptable levels of risk based on a unique risk exposure score, which is calculated by multiplying the probability rating by the impact for a given risk.

**Probability Categories**: will measure how likely it is that a risk event will occur.

|  |  |  |  |
| --- | --- | --- | --- |
| **Rating** | **Category** | **Definition** | **Criteria** |
| 1 | Rare | Highly unlikely to occur (less than 5% chance) | It occurs only in exceptional circumstances. Acceptable with minimal monitoring |
| 2 | Unlikely | Not expected to occur often (5% to 20% chance) | May occur occasionally. Acceptable if the impact is low |
| 3 | Possible | A moderate chance for risk event to occur, between 20% and 50% | Occurrence is feasible. However, there must be mitigation measures planned if the impact is moderate to high |
| 4 | Likely | The risk event is likely to occur, with a chance between 50% - 80% | Requires a pre-planned mitigation strategy |
| 5 | Almost Certain | The risk event is highly likely to occur, with a chance above 80% | Critical risk. Must be a comprehensive mitigation strategy. This is not acceptable unless impact is very minimal |

**Impact Categories**: The impact of a risk is evaluated based on how much it can affect the project’s schedule, cost, scope, or quality.

|  |  |  |  |
| --- | --- | --- | --- |
| **Rating** | **Impact Level** | **Definition** | **Criteria** |
| 1 | Insignificant | Minimal impact on scope, schedule, cost, or quality | Very minor delays (a few hours) and negligible cost differences that do not impact project outcomes. Acceptable with routine monitoring |
| 2 | Minor | Noticeable but manageable impact on scope, schedule, cost, or quality | Small delays (a few hours) or slight cost increases (less than 5% of the budget) can be accommodated without significant disruption. Acceptable if continuously monitored |
| 3 | Moderate | Significant effect on scope, schedule, cost, or quality | Potential delays lasting a few days or cost increases up to 10% of the budget. Requires proactive, planned mitigation measures to reduce the impact. |
| 4 | Major | Severe impact on scope, schedule, cost, or quality that can jeopardize project deliverables | A substantial delay (1-3 weeks), significant cost increases (10%-20% of budget), critical scope changes. This requires a high priority mitigation strategy. |
| 5 | Catastrophic | Complete failure on project scope, schedule, cost, or quality | Extreme delay exceeding one month, cost overruns greater than 20% of budget, major deviation from planned scope that undermines projects quality. This level of risk is unacceptable and requires immediate and comprehensive mitigation and escalation. |

**Acceptable Risk Levels Based on Exposure Score Table**

|  |  |  |
| --- | --- | --- |
| **Risk Exposure (Probability \* Impact)** | **Risk Level** | **Description** |
| Less than 7 | Low | Risks are generally acceptable with periodic monitoring |
| 8 to 14 | Medium | Risks require a planned mitigation strategy to keep them under control |
| 15 or more | High | Risks are not acceptable without an immediate, effective and comprehensive mitigation measure. This also requires an escalation to Project Manager. |

## Project Specific Risks

This section of the documents risks uniquely tied to the MediQ project’s scope, timeline, and stakeholders, as identified during risk workshops and sprint retrospectives. Each risk is cataloged in the Risk Register below.

**Risk Register**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **Description** | **Owner** | **Probability (1-5)** | **Impact (1-5)** | **Exposure**  **(PxI)** | **Response Strategy** | **Status** |
| R1 | Google Maps API integration fails | Leigh Balite  (Frontend) | 3 | 4 | 12 | Mitigate: Test fallback APIs (Leaflet.js); allocate buffer time | Open |
| R2 | Ministry of Health approvals causing schedule change | Stanislav Chirikov  (PM) | 4 | 3 | 12 | Mitigate: Buffer timeline for approvals; escalate to Sponsor | Open |
| R3 | Data inaccuracies (e.g. not meeting 85% accuracy target) | Deen Adenowo (QA)  Hamza Teli (Backend) | 2 | 5 | 10 | Mitigate: Add user validation and automated data checks | Open |
| R4 | Azure cloud outage disrupts | Matthew MacLennan  (DevOps) | 2 | 5 | 10 | Transfer: Use Azure SLA credits; implement multi-region backup | Open |
| R5 | PHIPA compliance violation due to data leaks | Stanislav Chirikov  (PM) | 2 | 5 | 10 | Avoid: Encrypt data; conduct security audits | Open |
| R6 | Low hospital participation in wait-time updates | Ministry of Health (sponsor) | 4 | 4 | 16 | Mitigate: Incentivize providers simplify data entry | Open |
| R7 | Third-party API downtime (e.g. healthcare providers) | Jordan Purcell  (Backend) | 3 | 4 | 12 | Transfer: SLA agreements; fallback | Open |
| R8 | Database scalability under high user load | Hamza Teli (Backend) | 3 | 4 | 12 | Mitigate: Optimize queries; implements caching | Open |
| R9 | Low user submissions of wait-times | Leigh Balite  (Frontend)  Deen Adenowo (QA) | 4 | 4 | 16 | Mitigate: Gamification; UX simplification, promotional campaigns | Open |

**Risk Analysis**

This section evaluates identified risks based on their probability, impact, and exposure to prioritize mitigation efforts. Risks are categorized as High, Medium, or Low using a 5x5 probability-impact matrix. Quantitative analysis estimates cost/schedule impacts, while contingency reserves are allocated to address high-priority risks. Root causes and residual risks are documented to ensure proactive monitoring.

**Risk Prioritization**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Risk Level** | **Risk ID(s)** | **Exposure (PxI)** | **Project Impact** | **Timeline** | **Linked Deliverable** |
| High | R6, R9 | 16 | **R6**: 3-week delay to Phase 3 **R9**: Accuracy drops to 70%, reducing overall accuracy of wait-time displays  Both risks cause critical impact towards the project’s functionality and success. Sufficient submissions and participation from hospitals/clinics are crucial for the project to move forward. | Immediate (Sprint 2-3) | Risk Report (Bi-weekly) |
| Medium | R1, R2, R7, R8 | 12 | **R1**: Sprint 3 delayed 1 week (API fallback testing).  **R7/R8**: Search latency exceeds 5s target. | Next Sprint | Sprint Retrospective Notes |
| Medium | R3, R4, R5 | 10 | **R3**: Data accuracy drops to 75%.  **R5**: PHIPA audit failure (fines up to $10K). | Monthly | Risk Audit Report; Lessons Learned |

**Quantitative Analysis**

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk ID** | **Potential Impact** | **Cost Impact** | **Schedule Impact** |
| R6 | Hospitals refusing data sharing | $20K (incentives and manual entry) | +3 weeks to Phase 3 (development) |
| R9 | Low user submissions (<50% target) reduce data accuracy to 70% (vs. 85% goal) | $15K (UX fixes and campaigns) | +1-2 weeks to Testing Phase |
| R1 | Google Maps API failure | $5K (fallback API testing) | Sprint 3 delayed by 1 week |

**Risk Heat Map**

A diagram of a heat map

AI-generated content may be incorrect.

**Contingency Reserve Allocation**

*From the Cost Management Plan’s $46K Contingency*

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk ID** | **Contingency Use** | **Amount** | **Owner** |
| R6 | Hospital incentive programs | $20K | Ministry of Health |
| R9 | User engagement campaigns | $15K | Leigh Balite |
| R1 | Leaflet.js license (fallback API) | $5K | Leigh Balite |

**Root Cause and Mitigation Adjustments**

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk ID** | **Root Cause** | **Revised Mitigation** | **WBS Task** |
| R6 | No mandate for hospitals to share data | Partner with Ministry to enforce SLAs | 1.2.2 (API Dev) |
| R9 | Complex UX discourages submissions | Simplify UI (per Quality Plan Section 5) | 1.1.3 (UI/UX Design) |
| R5 | PHIPA audits not scheduled | Monthly security audits (QA Lead) | 1.3.2 (Security Test) |

**Residual Risk Assessment**

*Below is a list of risks that remain after mitigation.*

|  |  |  |
| --- | --- | --- |
| **Risk ID** | **Residual Exposure** | **Monitoring Plan** |
| R6 | 2 (Medium) | Bi-weekly Ministry check-ins (per Communications plan) |
| R1 | 6 (Low) | API uptime alerts in Jira |

## Revision procedures

To ensure the MediQ Risk Management Plan remains effective and aligned with the project realities, a structured revision process is established. This process defines how changes to the plan are proposed, reviewed, approved and communicated to all stakeholders.

1. **Initiating a Revision**

Any project team member may propose a revision to the Risk Management Plan based on the following:

* Identification of new risk types not previously covered.
* changes in regulatory or organizational requirements.
* process inefficiencies discovered during implementation
* Lessons learned from previous risk events or sprint reviews.

**2. Review and Approval**

The Project Manager reviews all proposed revisions for completeness and relevance.

* Minor edits may be approved by the Project Manager alone.
* Moderate revisions require team review and consensus during sprint planning.
* Major changes must be reviewed and approved by the Project Sponsor.

Each approved must be documented in the Revision History Log, which includes Date of change, Description of change, name of requestor and approver.

**3. Communication and Training**

Upon approval, the updated plan or documentation will be:

* Distributed via project communication channels (e.g. Slack or email).
* Posted on project repository.
* Reviewed during the next team's sprint planning meeting.

**4. Frequency of Review**

Even without formal change requests, the Risk Management Plan will be reviewed quarterly by the Project Manager and QA Lead to ensure relevance and accuracy. This review will include.

* Alignment with current project and risk procedure
* Effectiveness of the current and deliverables.
* Feedback from stakeholders and retrospective insights.

**5. Version Control**

* All versions of the Risk Management Plan will be maintained in the project’s document repository under the version control, with file names following the convention.
* Only the latest version will be considered active; all prior versions will be archived for reference and audit purposes.

# References

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