# QMePls

by Team Titans

# Team Members

Jolene Tan (U1921255B) - Project Manager

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# Outline

1. Product Introduction
2. Live Demonstration
3. Design for Maintainability
4. Software Quality Assurance
5. Project Management
6. Risk Management

# Product Introduction

- Background
- Objective
- Product and Functionalities

# Background

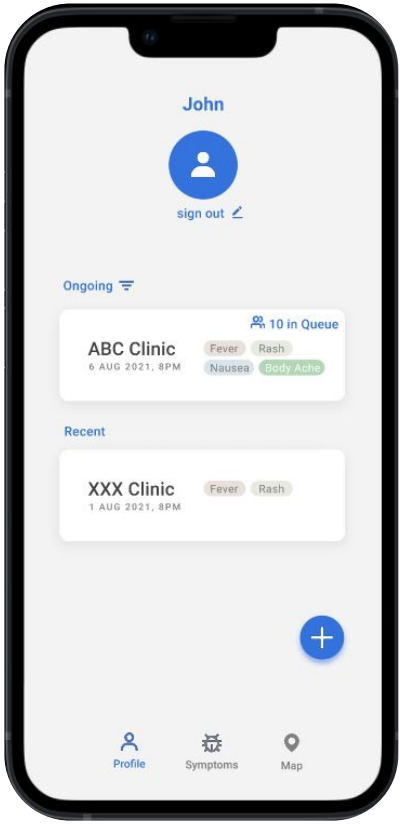
- Increasing waiting time in clinics, in addition to the rise of COVID-19 cases
  - A clinic in Sengkang was observed to have an average waiting time of 86 minutes 95% of time
- Patients dread waiting times at clinics, especially when ill
- Limited capacity due to social distancing measures

# Objectives

- Enhance the queuing experience of patients
- Breach the gap between waiting time and which clinic to visit
- End-to-end clinic booking application

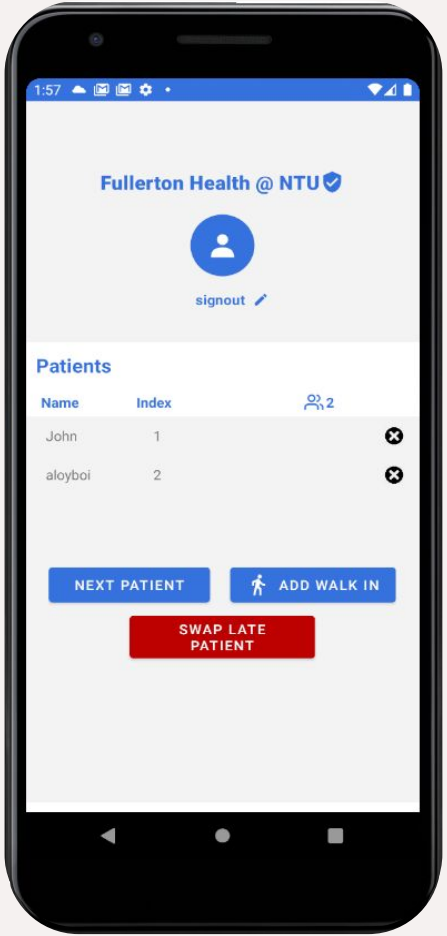
# The Product

- ‘QMePls’ is an end-to-end Android application where users are able to check waiting times at nearby clinics, book queue slots and further input relevant symptoms as a log to ease consultation with doctors



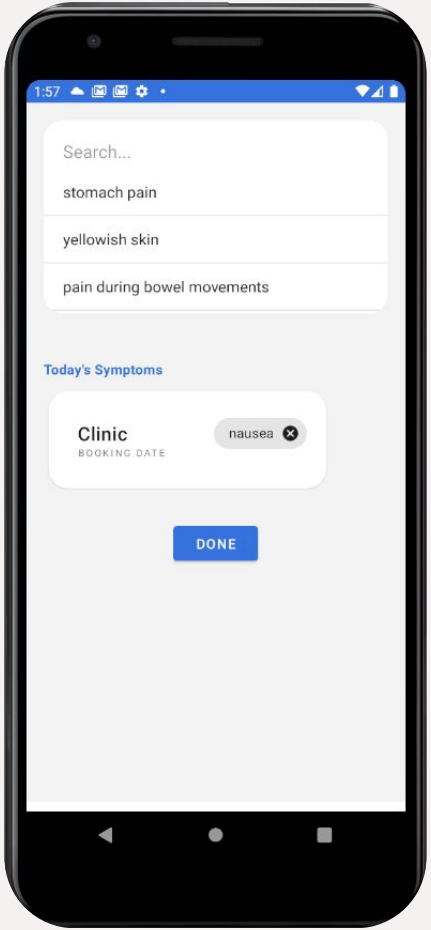
# Login/User Authentication

- Two domains - Patient and Clinic
- Register and Login with Gmail Account



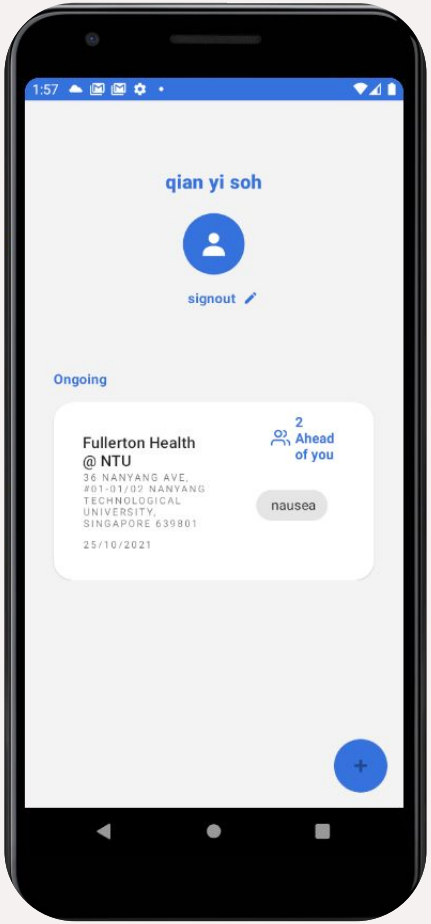
# Symptom Selector

- Symptoms retrieved from database
- Users can input symptoms in fuzzy search bar
- Add symptom into health report card



# Clinic Map & Book Appointment System

- Allows users to check current queue number for top 3 nearest clinics
- Allows users to book their slots for the selected clinic

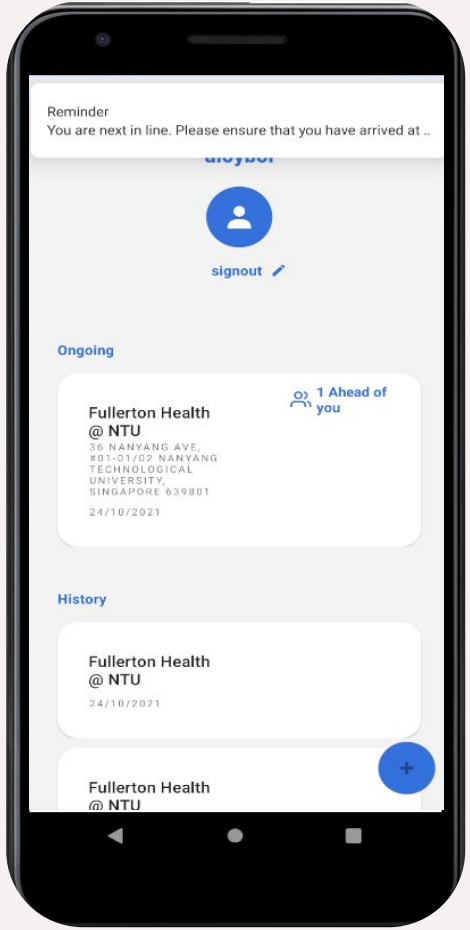


# Queue Management System

- System must retrieve the queue information from the User database
- Clinic Staff User must be able to
  - add a walk-in patient
  - skip to the next patient
  - push patient index down by 2

# Notification System

- Application sends notification to patient users when they are next in line



# Design for Maintainability

1. Design Strategies
2. Architectural Design Patterns
3. Software Configuration Management Tools

# Design Strategies

1. Planning Phase
2. Process of Development
3. **Correction by Nature**
4. Enhancement by Nature
5. **Maintainability Practices**

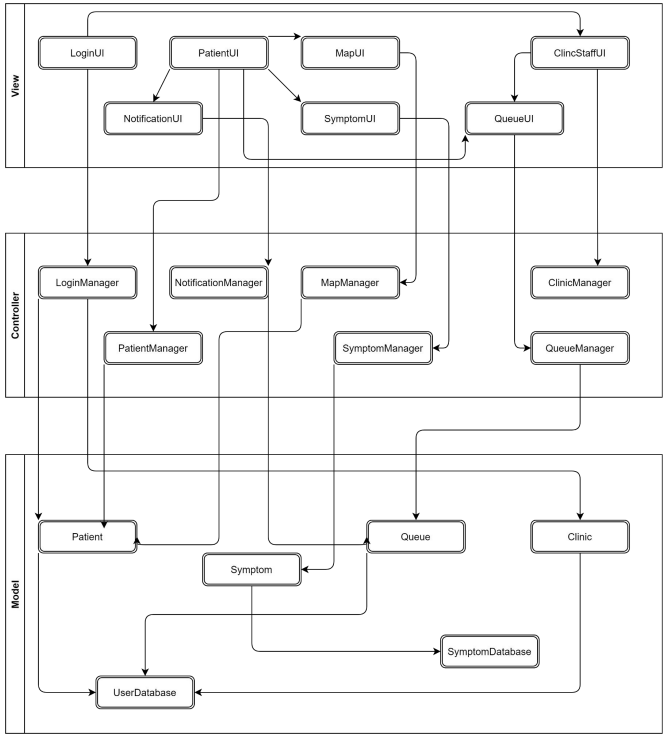
# Correction by Nature

- Corrective Maintainability
- Preventive Maintainability

# Maintainability Practices

- Codes are commented for better readability and ease of understanding
- Standardized documentation format
- Frequent and incremental changes to the code base
- Version control
- Loose coupling
- High cohesion
- Modularity

# Architectural Design Patterns



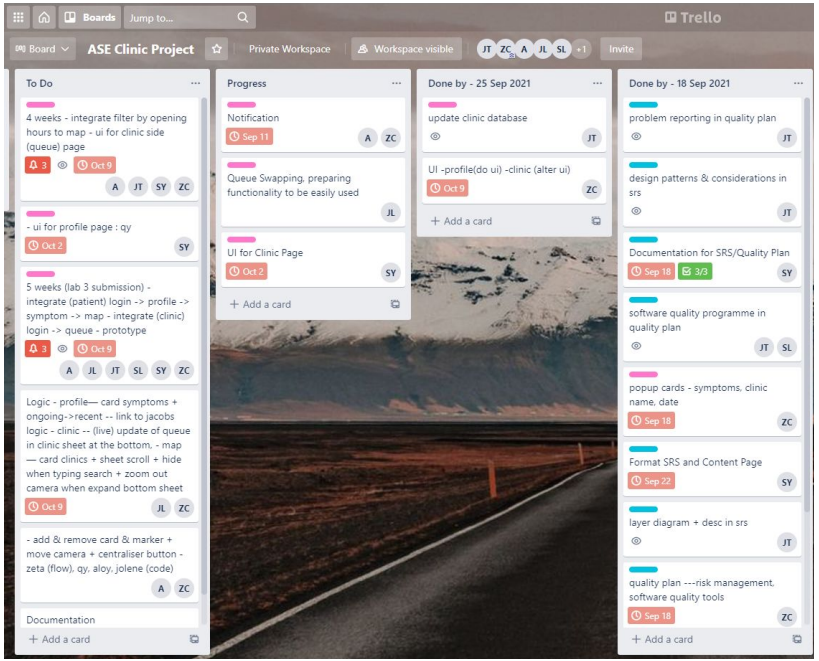

## Model-View-Controller

In a Layered System Architecture format

# Software Configuration Management Tools




# Trello


Boards
Jump to...
Trello
Board
ASE Clinic Project
Private Workspace
Workspace visible
Invite
To Do
4 weeks - integrate filter by opening hours to map - ui for clinic side (queue) page
Oct 9
- ui for profile page : qy
Oct 2
5 weeks (lab 3 submission) - integrate (patient) login -> profile -> symptom -> map - integrate (clinic) login -> queue - prototype
Oct 9
Logic - profile— card symptoms + ongoing->recent -- link to jacobs logic - clinic -- (live) update of queue in clinic sheet at the bottom. - map — card clinics + sheet scroll + hide when typing search + zoom out camera when expand bottom sheet
Oct 9
- add & remove card & marker + move camera + centraliser button - zeta (flow), qy, aloy, jolene (code)
Documentation
Add a card
Progress
Notification
Sep 11
Queue Swapping, preparing functionality to be easily used
UI for Clinic Page
Oct 2
Add a card
Done by - 25 Sep 2021
update clinic database
UI -profile(do ui) -clinic (alter ui)
Oct 9
Add a card
Done by - 18 Sep 2021
problem reporting in quality plan
design patterns & considerations in srs
Documentation for SRS/Quality Plan
Sep 18
3/3
software quality programme in quality plan
popup cards - symptoms, clinic name, date
Sep 18
Format SRS and Content Page
Sep 22
layer diagram + desc in srs
quality plan ---risk management, software quality tools
Sep 18
Add a card

# Software Quality Assurance

Ensures that QMePls meets and complies with defined or standardized quality specifications

# Quality Assurance (QA)

**Product Assessments**

- Weekly checklist for functional requirements
- Weekly checklist for non-functional requirements

**Process Assessments**

- Weekly code review to be in line with software metrics
- Weekly progress check for QMePls against proposed Gantt Chart timeline
- Weekly meeting to verify adherence to requirements specification

## Management Reviews

1. Weekly scheduled meetings
2. Cloud storage for documentations (Google Drive)
3. Evaluate effectiveness of management approach

## Technical Reviews

1. Ensure design practices are followed and consistent
2. Follow closely with Software Metrics
3. Testing

# Testing

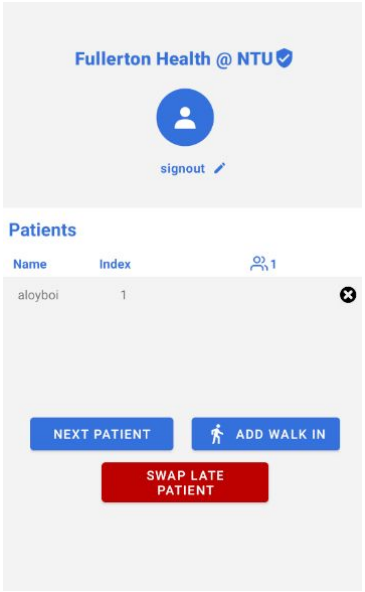
# Blackbox Test: Clinic Staff Testing

| | |
|---|---|
| **Test Case ID:** | 16 |
| **Test Executed By:** | Aloysius Seow |
| **Test Description:** | Testing the ability to remove the first person in clinic queue with only one person in queue. |
| **Priority:** | Medium |
| **Precondition:** | 1. The system has an active connection to the internet.<br>2. Clinic Staff User has already logged into the system under ‘Clinic’ Domain.<br>3. The clinic queue must only have one patient in Queue |
| **Test Data:** | - |
| **Test Steps:** | 1. Click on ‘Next Patient’ button<br>2. Click on ‘Confirm’ |
| **Expected Results:** | Clinic queue reduce to 0 |
| **Actual Result:** | java.lang.NullPointerException: Attempt to invoke virtual method 'void android.widget.TextView.setVisibility(int)' on a null object reference |
| **Status (Pass / Fail):** | Fail |
| **Comments:** | App crashes when queue number becomes 0 |

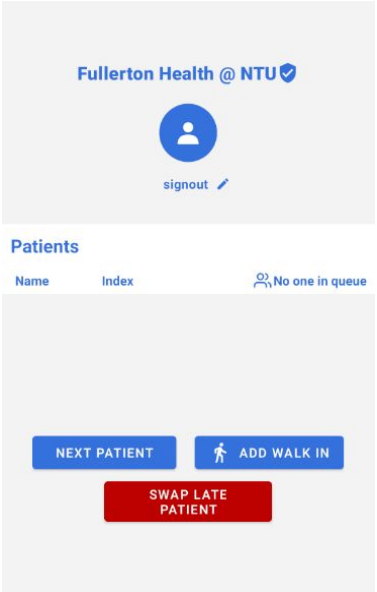
# Blackbox Re-test: Clinic Staff Testing

| | |
|---|---|
| **Re-test Case ID:** | 1 |
| **Test Executed By:** | Aloysius Seow |
| **Test Description:** | Retesting Test Case 16 after code fix |
| **Priority:** | High |
| **Precondition:** | 1. The system has an active connection to the internet.<br>2. Clinic Staff User has already logged into the system under ‘Clinic’ Domain.<br>3. The clinic queue must only have one patient in Queue |
| **Test Data:** | - |
| **Test Steps:** | 1. Click on ‘Next Patient’ button<br>2. Click on ‘Confirm’ |
| **Expected Results:** | Clinic queue reduce to 0 |
| **Actual Result:** | Clinic queue reduce to 0 |
| **Status (Pass / Fail):** | Pass |

| Comments: | |
|---|---|




(Before)




(After)

# Build Verification Test (BVT)

```
> Task :app:mergeDebugAndroidTestAssets UP-TO-DATE
> Task :app:compressDebugAndroidTestAssets UP-TO-DATE
> Task :app:processDebugAndroidTestJavaRes NO-SOURCE
> Task :app:mergeDebugAndroidTestJavaResource UP-TO-DATE
> Task :app:mergeDebugAndroidTestJniLibFolders UP-TO-DATE
> Task :app:mergeDebugAndroidTestNativeLibs UP-TO-DATE
> Task :app:desugarDebugAndroidTestFileDependencies UP-TO-DATE
> Task :app:dexBuilderDebugAndroidTest UP-TO-DATE
> Task :app:checkDebugAndroidTestDuplicateClasses UP-TO-DATE
> Task :app:mergeExtDexDebugAndroidTest UP-TO-DATE
> Task :app:mergeLibDexDebugAndroidTest UP-TO-DATE
> Task :app:mergeProjectDexDebugAndroidTest UP-TO-DATE
> Task :app:validateSigningDebugAndroidTest UP-TO-DATE
> Task :app:packageDebugAndroidTest UP-TO-DATE

> Task :app:connectedDebugAndroidTest
Starting 1 tests on Pixel_2_API_30(AVD) - 11

> Task :app:connectedAndroidTest

BUILD SUCCESSFUL in 1m 13s
94 actionable tasks: 2 executed, 92 up-to-date
Build step 'Invoke Gradle script' changed build result to SUCCESS
No emails were triggered.
Finished: SUCCESS
```

# Project Management

1. Project Organization
2. Project Estimation
3. Project Schedule

# Project Organisation

1. **Team Structure**
2. Roles and Responsibilities
3. **Team Communication**

# Team Structure

- Project Manager - Jolene Tan
- QA Manager/QA Engineer - Aloysius Seow
- Release Manager - Soh Qian Yi
- Lead Developer - Jacob Law
- Back-End Developer - Samuel Lee
- Front-End Developer - Zeta Chua

# Team Communication

- Bi-weekly physical meetings
- Telegram group
- Weekly online discussions
- Splitting into subgroups

# Project Estimation

1. Unadjusted Function Points
2. **Efforts, Duration and Team Size Estimation**
3. Cost Estimates

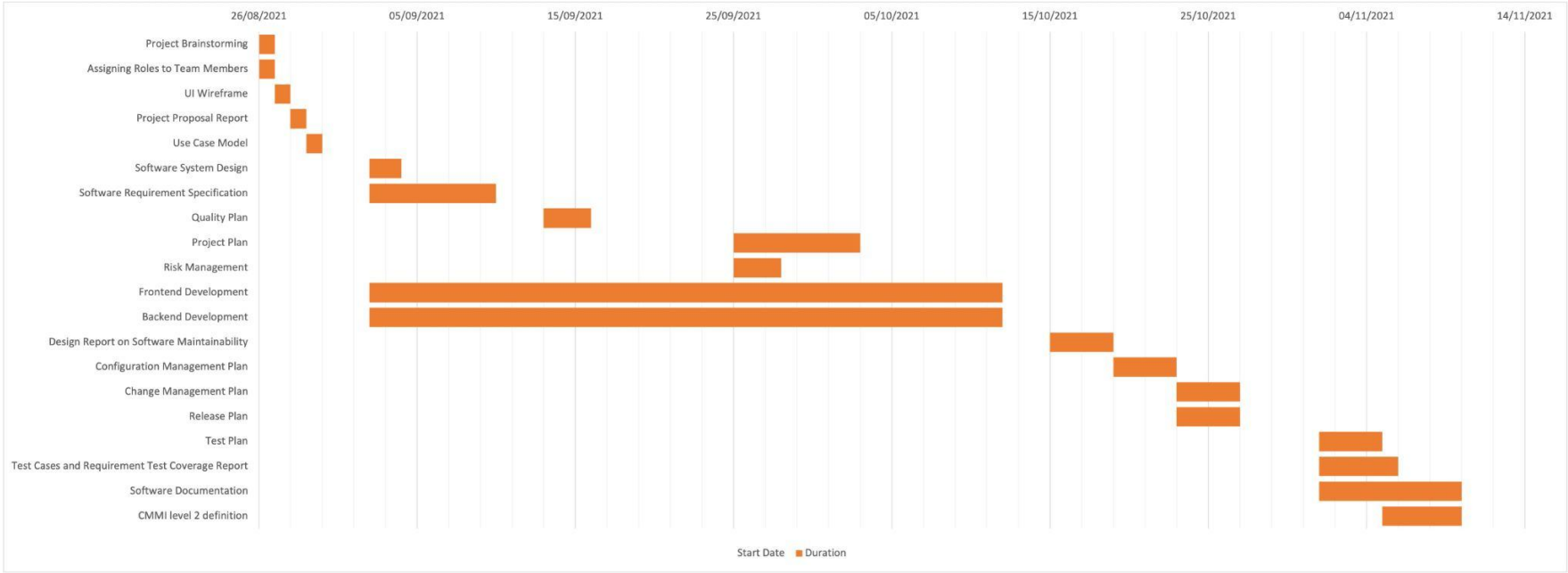
# Efforts, Duration and Team Size Estimation

- Working days include 5 days in a week
- Effort = Size / Production Rate = (6919.68 LOC) / (62 LOC/PD)  = 111.61 PD
- Duration = 3 × (111.61)⅓ = 14.44 Days
- Initial schedule = 14.44 Days/ 5 Days a week = 2.89 Days
- Team Size = Effort / Duration = 111.61 / 14.44 = 7.73 P= 8 Persons
- Working hours include 8 hours in a working day.
- Total person-hours (PH) = 111.61 × 8 = 892.88 PH

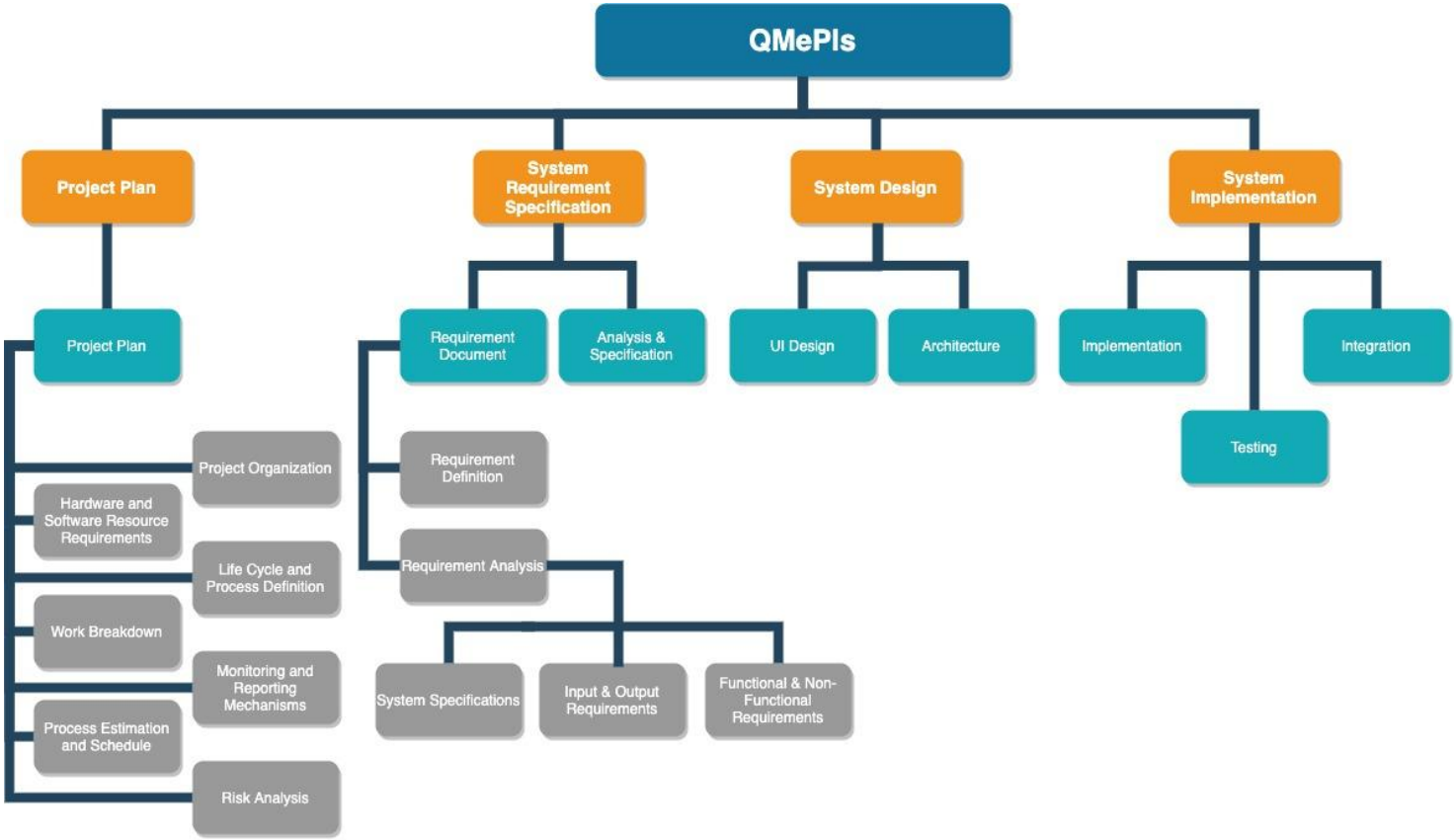
# Project Schedule

1. **Activity Dependencies and Schedule**
2. **Work Breakdown Schedule**
3. Work Packages
4. Activity Dependencies
5. Work Package Details

# Activity Dependencies and Schedule



# Work Breakdown Schedule



# Risk Management

# Purpose of Risk Management

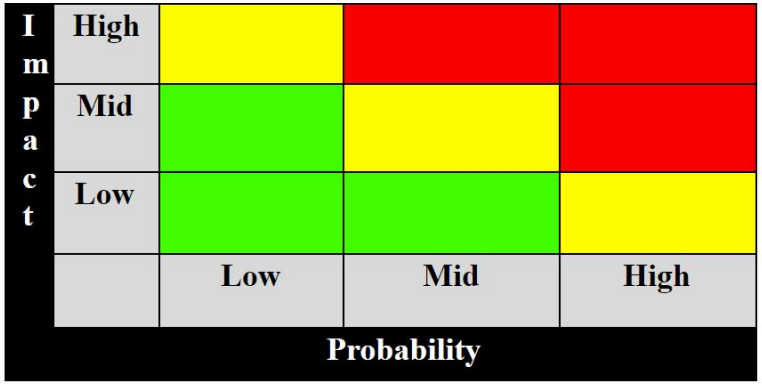
1. Risk Identification
2. Analysis of the risk to reward/satisfaction
3. Risk Response Planning
4. Monitoring of said risks

# Risk Identification

- Technical - Data related issues
- Project Management - Project objectives
- Resource Management - Budget & Time
- Political - Legal Obligations
- Project Team - Communications & Leadership

# Risk Analysis

- Qualitative Risk & Quantitative Risk
- Probability - Chance of Occurence
- Impact - Cost, Schedule or Performance



# Risk Analysis - Qualitative

| Risk | Probability | Impact | Consequences |
|---|---|---|---|
| Fully loaded database | Medium | Medium | - Slow fetching times<br>- Inability to add new Patient Users/Clinics |
| Malicious attacks on the server | Medium | High | - Disclosure of confidential information |
| Loss of server data | Low | High | - Loss of confidential information<br>- Loss of functionality of system |

# Risk Analysis - Quantitative

| Risk | Numerical Risk Value (1-10) |
|---|---|
| Fully loaded database | 5 |
| Malicious attacks on the server | 8 |
| Loss of server data | 9 |

# Risk Response Planning

- Avoid - Malicious Attacks, Fully Loaded Database
- Mitigate -Fully Loaded Database, Project awareness/objective changes
- Accept - Change in stakeholders direction/plans
- Transfer - Loss of Server Data

# Risk Monitoring

- Generate a list of high risk issues and have regular updates/reports as a component of the project status
- Draft a Standard Operating Procedure (SOP) document detailing steps to mitigate/avoid/transfer said risks
- Quarterly risk assessments to update and asses current and new potential risks.
- Notify managements on important changes to risks statuses as a component of the Executive Project Status Report

# Live Demonstration

# Thank You!