

Combined Project Plan: MemorEZ Application

Version 3.0

Consolidated by James Eble (Project Manager)

UMGC SWEN670 – Spring 2022

Professor: Dr. Mir Assadullah

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Section 1 – Overall Project Scope

Project Manager: James Eble

Revision History for Combined Project Plan:

Version	Date	Reason	Approved By
1.0	1/30/22	Combined Versions	James Eble
1.1	1/31/22	Fixed Headings	James Eble
1.2	2/3/22	Professor Feedback	James Eble
2.0	2/6/22	Add Test Plans	James Eble
3.0	3/23/22	Revision	James Eble

1. Background

The SWEN670 spring semester project expectations are conveyed in the course syllabus (UMGC, 2022). To briefly summarize the project, the class is to create a mobile application that can be utilized by those with short term memory loss. Available to students are a set of application requirements appropriated by the professor under UMGC along with a prototype application designed and developed by the previous semester's students. From these artifacts the class is to plan, design and document an open source application through one development lifecycle.

2. Stakeholders

The following tables show the stakeholders directly involved in the project. Included are university associates, student teams, and subject experts.

Table 1.

University Associates

Name	Role
UMGC	University of Maryland Global Campus
Dr. Mir Assadullah	Professor
Roy Gordon	Mentor
Rob Wilson	Mentor
Daniel Avery	Mentor

Table 2.

Subject Experts

Name	Role
Andrea	Requirement Author and Nursing Home Owner
Dr. Andrea Evangelista	Primary Care Physician / Subject Expert

Table 3.***Project Teams***

Team	Role
James Eble	Project Manager
FlutteringMind	Patient Mode
RememberAll	Caregiver Mode
DevSecOps	Development/Security/Operations

3. Project Work

General work requirements for the project are stated in the course syllabus (UMGC, 2022). The course is divided into four milestones with related work as follows:

- **Milestone 1** (Due 1/15/2022)
 - Project Plan
 - Software Requirements Specification (SRS)
- **Milestone 2** (Due 1/29/2022)
 - All Teams: Technical Design Document
 - Development Teams: Add Software Test Plan to Project Plan
 - DevSecOps Team: Development and Operations Guide
- **Milestone 3** (Due 3/19/2022)
 - Development Teams: Programmer Guide
 - Development Teams: Deployment and Operations Guide (Runbook)
 - DevSecOps Team: Add Software Test Plan to the Project Plan
 - DevSecOps Team: User Guide
- **Milestone 4** (Due 04/02/2022)
 - Development Teams: User Guide
 - All Teams: Test Report
 - DevSecOps Team: Programmer Guide

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Figure 1 below shows a diagram of the work for each team with estimates of time to complete for each artifact.

Figure 1.

Diagram of Work Breakdown

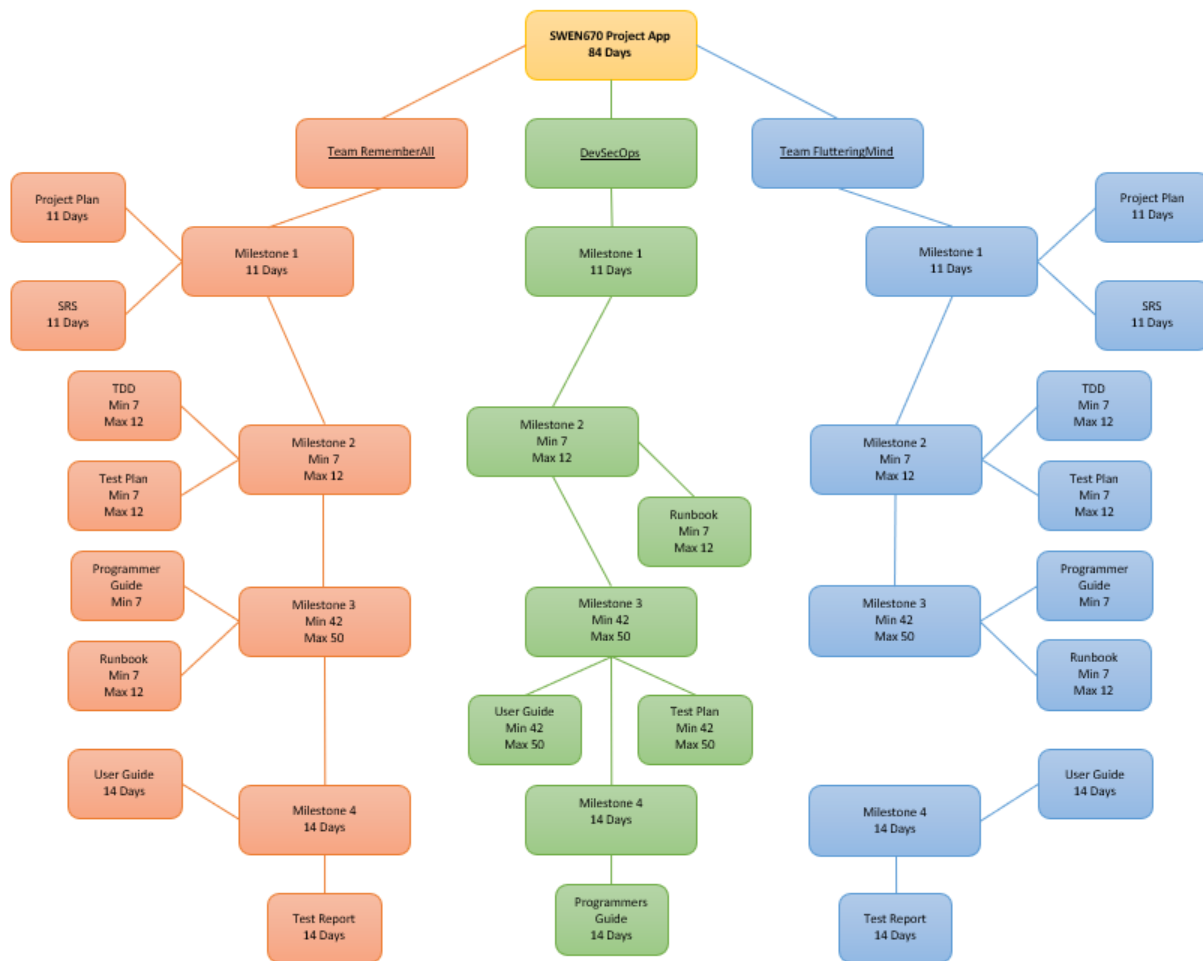
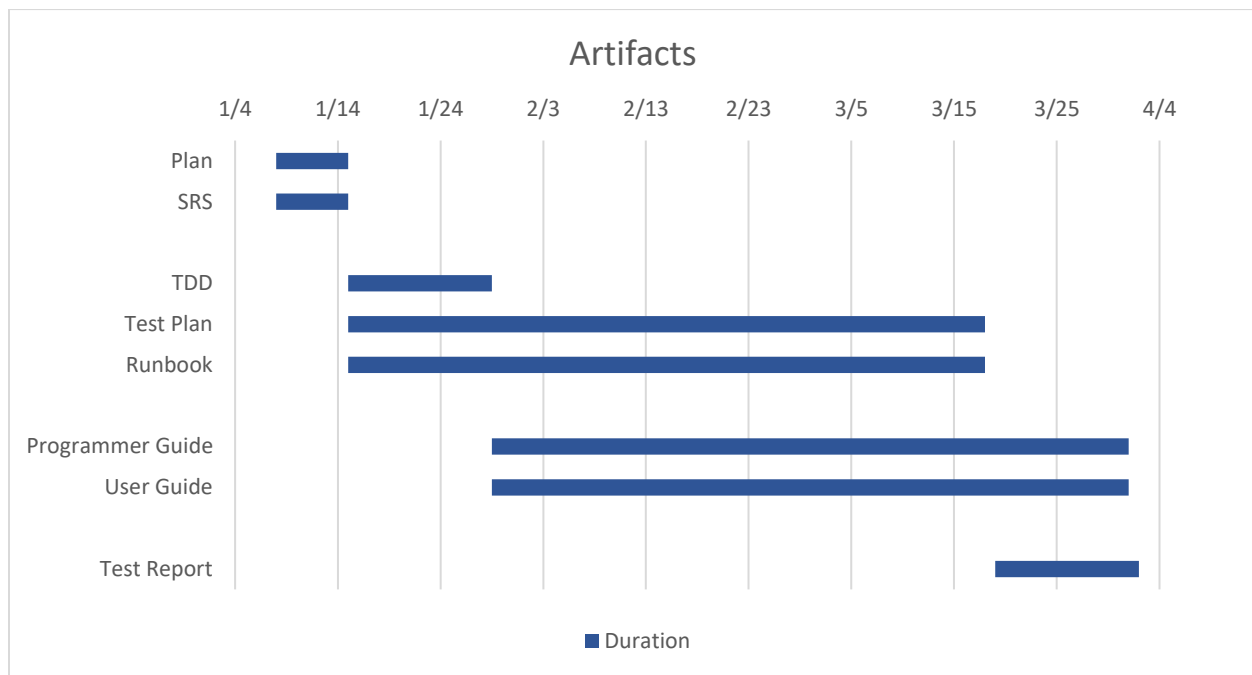


Figure 2 below shows a graph of the scheduled times and duration for each of the artifacts.

Figure 2.

Artifact Schedule Graph



4. Other Requirements

Although not mentioned in the contract (syllabus) additional directives include:

- Utilization of cloud resources for collaboration
- Implementation of software through programming framework
- Automated delivery of software product

5. Estimates

The following salaries should be used in the project to estimate expenses:

- Project Manager: \$92,198 per year (*IT Project Manager Salary in United States, 2021*)
- UI/UX Designer: \$77,312 per year (*User Interface Designer salary in the United States, 2021*)
- Lead Developer: \$110,569 per year (*Lead Developer salary in United States, 2021*)
- Test Engineer: \$86,641 per year (*Software Test Engineer salary in United States, 2021*)
- Developer: \$117,993 per year (*Software Engineer salary in United States, 2021*)
- Business Analyst: \$68,971 per year (*IT Analyst salary in United States, 2021*)
- DevSecOps: \$117,760 per year (*Development Operations Engineer salary in United States, 2021*)

References for Section 1

Development Operations Engineer salary in United States. (2021). Indeed.com. Retrieved 2/3/2022 from https://www.indeed.com/career/development-operations-engineer/salaries?from=top_sb

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University of Maryland Global Campus. (2022). *Syllabus*. SWEN670 9040 Software Engineering Project (2222). <https://www.umgc.edu/index.cfm>

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Section 2 – MemorEZ Patient Mode

Team FlutteringMind

Revision History for Patient Mode

Revision Number	Date	Description	Authors	Reviewed & Approved By
1.0	01/21/2022	Initial Release	Selina Zaman Vanessa Stringer Joshua Fischer Joseph Jewell Daryle Urrea Sean LaMonica Anusha Ramanan	Selina Zaman, Vanessa Stringer, Joshua Fischer
1.1	01/28/2022	Updated Requirements	Selina Zaman Vanessa Stringer	Selina Zaman Vanessa Stringer Joshua Fischer Joseph Jewell Daryle Urrea Sean LaMonica Anusha Ramanan
1.2	01/05/2022	Added Software Test Plan	Selina Zaman Anusha Ramanan	Selina Zaman Vanessa Stringer Joshua Fischer Joseph Jewell Daryle Urrea Sean LaMonica Anusha Ramanan
1.3	03/19/2022	Updated Project Plan	Selina Zaman Anusha Ramanan	Selina Zaman Anusha Ramanan

1. General Information

1.1 Background

Short-term memory or active memory helps people store a small amount of information in their minds and have it available right away as needed for a short period of time. Basically, short-term memory is a brief memory to store 5-9 items at once for a 20 -30 second timeframe (Cherry, 2021). Inability of storing small amounts of information in active memory is known as short-term memory loss or STML. Aging and as well as many diseases and non-permanent factors can cause STML. Some of the diseases include Alzheimer's, dementia, and non-permanent factors include misuse of alcohol and drugs, depression, stress, sleep deprivation, and medication side effects, etc.

A study in 1999 by Petersen RC, Smith GE and a group of researchers showed that 10% of people aged 65 years or older have some signs of cognitive impairment which affects their ability of remembering, learning something new, concentrating, or making decisions that affect their everyday life, and nearly 15% of them eventually develop Alzheimer's each year. (Cherry, 2021). An article from CDC states that an estimated 5.1 million Americans aged 65 years or older may currently have Alzheimer's disease, the most well-known form of cognitive impairment; this number may rise to 13.2 million by 2050 (CDC, Cognitive Impairment, 2011). To help people with STML, United Global Masters Coders are working to develop a mobile application with improved features and sub-features with speech recognition technology to help them provide reminders of their daily activities.

1.2 Statement of Need

The purpose of the project is to design and build the Patient mode of the MemorEZ application and merge this Patient mode with the Admin/Caregiver mode which will be designed and built by team RememberALL. Teams will collaborate to help design, build, improve, and implement an application required by our clients to help people with STML disease. Our team will go through the requirements of the client to satisfy the business needs of the application. Once the requirements are finalized and confirmed by the stakeholder, the team will start building the technical design documents and start implementing the application. This project plan will help provide an overview on the overall high-level plan for the patient mode for this project.

1.3 Vision Statement

The vision for United Global Masters Coders is to merge team FlutteringMind's work of Patient mode with team RememberALL's Admin mode to implement an improved user interface (UI), screen layout, improved visual features and sub-features of the application to help individuals with STML to view reminders and tasks from their caregivers to better prepare them for their daily activities.

2. Project Assignment

Our product will utilize the SMART tool technique, which stands for Specific, Measurable, Achievable, Realistic, and Time. Below is a table provided on how our system 's matrix will be implemented with the SMART tool (Project-Managment.com, 2019).

- MemorEZ application will implement **Specific** features and sub-features based on the requirements by the clients.
- MemorEZ application will be **Measurable** and will be able to track project goals and assess the effectiveness of the short-term memory aid.
- MemorEZ application will be **Achievable** to meet the project's success criteria.
- MemorEZ application will be **Realistic** which aims to make our objectives more realistic with the agreed time and budget which may lower the total project plan.
- MemorEZ application will be completed within the **Time** that is the most practical option for addressing the problem within a deadline/milestone.

Below is a table explaining the SMART goals for the project.

Table 1 – SMART Goals focusing on the Patient Mode

Goal	Description
S - Specific	<p>In this semester, SWEN 670 Master Coders class's main goal is to build and improve MemorEZ application for the individuals with short term memory loss and their caregivers and deploy the application</p> <p>Some of the most important and specific goals that need to be accomplished:</p> <ul style="list-style-type: none"> • The patient mode shall allow for tasks, notes, calendar, profile, settings, chat and help functionalities need to be accomplished. • The system shall display the details of appointments entered by the caregiver mode in a read-only calendar in the patient mode. • Patient mode UI shall have large labeled, and colorful icons for easy viewing. • The application shall notify/remind the patient of an upcoming scheduled appointment or event at the time specified in the caregiver mode. • The device storage will be done locally, the MemorEZ application shall store all the data in the device locally. • The patient mode shall get customized reminders to receive notification for tasks and appointments from the caregiver mode.
M - Measurable	<p>To create the MemorEZ application, a measurable time frame is scheduled. The project shall use Scrum Methodology, 1 iteration and 2 weeks every sprint in the iteration. A progress shall fulfill the high-level criteria at the end of each weekly tech meeting for every sprint.</p>
A - Achievable	<p>After Dr. Mir Assadullah launched the project and the stakeholder requirements and expectations for SWEN670 Capstone Course, PM and the team members read through and analyzed the requirements, got into a meeting with the stakeholder to get clarification and feedback on the requirements and came up with the application's finalized list of requirements. The team's goal is to design and implement an application that shall satisfy the demand of the stakeholder providing an efficient solution for individuals with short-term memory loss within the given schedule.</p>
R - Realistic	<p>The team has completed each job and role for the purpose of the application design, development, and maintenance after assessing all the team members and the PM. The team shall be utilizing a Trello board with Trello cards each containing a requirement for the application. Given the work there will be about 80 cards in total to cover all the requirements.</p>

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Goal	Description
T - Time-bound	The team's project manager has established a milestone for each step and there are a total of four milestones before the MemorEZ application is released to the customer. The total time/schedule is set up for 11 weeks.. The project can be divided into five phases of software development life cycle (SDLC): 1) planning, 2) gathering and analyzing the requirements, 3) designing the application, 4) developing the application, and 5) testing the application. The project goal is to ensure that the final product is satisfactory before releasing it to the production for the client. The mobile application, MemorEZ shall be available for use after 11 weeks of the SWEN 670 course.

2.1 Project Scope

The Project Plan's scope for the FlutteringMind project team begins with the initial Planning Phase, during which a communication strategy is established, project goals and objectives are identified, and requirements are defined. A vision statement, business needs statement, Project Management and Business Analyst (BA) Statement of Work (SOW) will be drafted. In the Design Phase, UX/UI designers will create mockups for the software to fulfill the requirements outlined in the planning phase. In the Development and Engineering Phase, developers will write the application code to reflect the mockups created in the Design Phase and align with requirements. In the Testing Phase, testers will test the application to verify and validate the MemorEZ application. The Execution Phase will finalize the project, deploy the application, and submit a high-quality product to the customer.

The project work's scope is to develop a revision of a mobile application designed to aid individuals suffering from Short-term Memory Loss (STML) and their caregivers. The mobile application will be developed in Android Studio using Flutter and the Dart programming language for cross-platform use on Android and iOS. The caregiver mode of the MemorEZ mobile application will be developed by Team RememberAll. The FlutteringMind team will work towards the project objective in developing the patient mode of the MemorEZ mobile application using the following high-level functional and non-functional requirements.

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2.1.1 Functional Requirements:

Requirements#	Functional Requirements
Req 1	The application shall have a patient mode and an admin/caregiver mode.
Req 2	The application shall take the user through an onboarding process when opening the application for the first time.
Req 3	The application shall include a calendar.
Req 4	The application shall notify/remind the user of an upcoming scheduled appointment or event.
Req 5	The application shall display a list of Active tasks and event reminders for the day in the patient mode.
Req 6	The application shall display notifications for tasks assigned in the admin/caregiver mode to be visible to the user in the patient mode.
Req 7	The application shall allow the user to upload an image as a response to an assigned task, mark the specified task as complete, and remove the task from the Active list of tasks and event reminders for that day in the patient mode.
Req 8	The application shall allow the user save an assigned task to be completed later in the patient mode.
Req 9	The application shall allow the user to view completed tasks and event reminders once removed from the Active list of tasks and event reminders in the patient mode.
Req 10	The application should provide the option for a mood questionnaire to be displayed for the user to complete at the intervals assigned in the admin/caregiver mode.
Req 11	The application should allow the user to notify a specified contact if the user's mood response requires attention.
Req 12	The application shall have a Profile in the patient mode that displays information about the user.
Req 13	The application shall provide a text-to-speech function in the patient mode of the application.
Requirements#	Functional Requirements
Req 14	The application shall provide a search function that allows for search by keyword.
Req 15	The application shall provide a help button.
Req 16	The application shall store information locally on the user's device.
Req 17	The application shall allow the user to use the speech-to-text feature to transcribe notes.
Req 18	The application shall allow the user to add a new note using voice or text as well as modify and delete existing notes.
Req 19	The application shall allow the user to sort a list of notes by date and group the notes by subject category.
Req 20	The application shall have a default language option of English and support additional multi language options.

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Req 21	The application shall allow the user to customize and manage start, stop, and recall trigger words and phrases.
Req 22	Upon recognizing the user's voice and phrases, the system shall begin recording a text note.
Req 23	The application shall recognize and ignore background voices and environmental noises.
Req 24	The application shall transcribe speech when key trigger phrases are mentioned.
Req 25	The system shall identify notes by date or subject category.
Req 26	The application shall prompt the user to permit the application to access their microphone, camera, and storage resources.
Req 27	Features shall be hidden if disabled in admin/caregiver mode.
Req 28	The application shall only listen and record speech when listening mode is activated.

2.1.2 Non-Functional Requirements:

Requirements#	Nonfunctional Requirements
Req 1	The application shall require user authentication to access the admin/caregiver mode of the application.
Req 2	The application shall not require user authentication to access the patient mode of the application.
Req 3	The patient mode of the application shall have a simplistic user interface that incorporates large, labeled, and colorful buttons with icons for ease of use.

2.1.3 Out of Scope Work

The following items are outside of the scope of this project:

- Remotely connecting the patient mode and admin/caregiver mode of the application.
- Changes to product features unless approved by the Product Owner and Stakeholder, Dr. Mir Assadullah.

2.2 Project Assumptions

The following project assumptions apply:

- The user should have access to an Android or iOS mobile device with the MemorEZ application downloaded.
- The user's device should have an active phone, messaging, and internet connection for which the MemorEZ application can access.
- The admin/caregiver will assist the individual with STML during the initial launch of the application to assist with setup and permissions on the mobile device.
- Any changes to the scope must be approved by the project managers and project stakeholder, Dr. Mir Assadullah.
- The mobile application software will be available for free to use for Android and iOS mobile users via the Good Play Store and the App Store and is developed "AS-IS" without a warranty or guarantee of maintenance or continued development. The University of Maryland is not responsible for anything once the app is established, the user is solely responsible for use.
- Team FlutteringMind will strive to develop the mobile application using the requirements outlined above with the best fitting solution, though
- The dates of milestone deliverables will not be changed.
- The mobile application software is open-source and thus cannot guarantee protection to the user during use of this application.
- The Project Manager (PM) and Business Analyst (BA) will monitor the progress and health of the project on a weekly basis to ensure the project proceeds as defined in the project schedule.

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2.3 Project Cost

The FlutteringMind team will not spend any money on the hardware and software tools to design and develop the application this semester. Team members will be spending a specific amount of work hour per day in a week to complete the project within 11 weeks. The estimated costs of resources, hourly rate, total hours, and cost are shown below in the table. The prices are calculated on the cost of resource labor alone, approximately 4 hours a day, 5 days a week, for an 11 week-long project of application documentation, design, development, and testing.

Table 2 - Project Cost (Hourly rates have been estimated from indeed.com)

Resources Cost Breakdown					
Category	Staff#	Resources Names	Hourly Rate	Total Hours	Cost
PM/Scrum Coordinator	1	Selina Zaman	\$44.33	297.00	\$13,166.01
Bussiness Analyst/Tester	1	Vanessa Stringer	\$41.65	297.00	\$12,370.05
UX/UI Designer, Developer	1	Joshua Fischer	\$56.70	297.00	\$16,839.90
Lead Developer	1	Daryle Urrea	\$53.16	297.00	\$15,788.52
Developer	1	Joseph Jewell	\$56.70	297.00	\$16,839.90
Tester	1	Anusha Ramanan	\$41.65	297.00	\$12,370.05
Tester	1	Sean LaMonica	\$41.65	297.00	\$12,370.05
Software tools	N/A	N/A	N/A	N/A	\$0.00
Hardware tools	N/A	N/A	N/A	N/A	\$0.00
Total	7		\$ 335.84	2079.00	\$99,744.48

2.4 Acronyms and Abbreviations

Table 3 – Acronyms and Abbreviations

Acronyms and Abbreviations	Definition
BA	Business Analyst
CDC	Center for Disease Control
DSO/DecSecOps	Development Security Operations
HIPAA	Health Insurance Portability and Accountability Act
PII	Personable Identifiable Information
PM	Project Manager
SDLC	System Development Life Cycle
SMART	Specific, Measurable, Achievable, Realistic, Time-bound. SMART tools aid in establishing the objectives of a project
SOW	Statement of Work
STML	Short-term Memory Loss
UI	User Interface
UX	User Experience
WBS	Work Breakdown Structure
OS	Operating System
iOS	Apple Operating System
SME	Subject Matter Expert

3. Risk Analysis

3.1 Risk Framework

Risk management is the process of identifying, assessing, planning for, and responding to threats. The risk analyst framework pictured below in Figure 1 will be utilized in order to maintain consistency for the duration of the project. A strong risk management plan can ensure preparedness to mitigate risks and impact of each risk (Montgomery O, 2021).



Figure 1 Risk Framework (Risk Framework, January 15, 2022)

3.2 Risk Assessment

The reason for the risk assessment is to help with the determination of priority levels of each risk. A matrix will be used (refer to section 3.4) to assess the likelihood of occurrence as well as the level of impact. This matrix organizes the risks into an easily understandable visual format. This communication will help the team understand and help mitigate the risks.

3.3 Application Risks and Vulnerabilities

Table 4 details the possible risks and vulnerabilities related to the MemorEZ application.

Table 4 – Risk and Vulnerabilities

Risk #	Threat	Vulnerability	Summary
1	Information Compromised	Application security features not kept up to date	Updates to OS of device or application
2	Feature Loss/Unavailability	Device not connected to network with internet	Patient mode Application dependency on caregiver mode
3	Not Inclusive Experience	OS/Device platform differences could affect end user experience	Application view or behaviors on different OS/Devices effects inclusivity
4	Data Integrity	PII compromised/stolen	Personal information stored in application could be stolen/manipulated
5	Data loss	Application data not saved	Application/user fault causes data to not be updated or saved accordingly

3.4 Risk Matrix

The risk matrix below helps to identify and categorize the risks mentioned in section 3.3. Each number in the matrix corresponds to the risk number in Table 4 in section 3.3. The matrix in Figure 2 breaks down the likelihood of happening as well as the acceptance level of the potential impact.

Figure 2 Key:

Low	
Medium	
High	
Very High	

Probability	Harm Severity			
	Negligible	Marginal	Critical	Catastrophic
Certain				
Likely	2			1
Possible		3	5	
Unlikely				4
Rare				
Eliminated				

Figure 2 Risk Matrix

3.5 Risk Register

A project risk register is used to track and monitor risks that might impact the project. The risk registry helps to minimize project setbacks. The risk register in Table 5 includes a risk number, risk description, probability of occurrence, risk owner, and mitigation plan.

Table 5 – Risk Register

Number	Description	Probability	Owner	Mitigation Plan
1	Scope not adequately defined	Possible	PM/BA	Understand requirements documents as well as meet with customer to ensure requirements are understood
2	Milestones not completed by due date	Possible	PM	Coordinate weekly meetings, initiate teams chat, create task list
3	Admin/patient mode integration failure	Likely	PM/Developers	PMs/developers from each team should work together to create plan for cross application functionality
4	Lack of Knowledge in Flutter/Dart causes missed deadlines for deliverables	Unlikely	Developers	Developers put time into learning Flutter to be able to deliver product

4. Organization of the project

The Team follows the agile scrum methodology. The scrum master will be hosting the daily scrum meetings for 15 minutes for a two-week sprints. There will be only one program increment with approximately two to three sprints in it. Milestone meetings are held before the milestone deadline. The repository will be created by DevSecOps Team. GitHub is used to track the development of the project, and other documents are stored in Microsoft Teams files.

4.1 Communication

Microsoft Teams will be used for the communication for the discussion related to the project. Weekly Team meetings will be held on Tuesdays to get the update on the project status. The overall project manager acts as a facilitator between the two team's project managers to get the project's status update and to resolve any open issues. Microsoft Team will be used for sharing any project related documents. It enables team productivity by leveraging its editing and version history feature.

4.2 Explanation of the Methodology

The agile Scrum framework is different from traditional methods. Work is divided into goals that can be completed in a two-week timed sprint. The team will hold daily scrum meetings of less than 15 minutes to keep track of the progress of the sprint. Once a sprint is complete, information is collected and reviewed to find out what to prioritize in the next sprint.

4.3 Project Staffing

Team FlutteringMind has a total of seven members including a PM, a requirements specialist, business analysts, UX/UI designers, developers, and testers. The team members support each other based on their expertise, deadline, needs, and availability. As our project is following Scrum methodology, our time frame is very short of 11 weeks which requires one team member to take on multiple responsibilities as the project moves forward. Below is a chart of all the team members working on the application on the Patient mode:

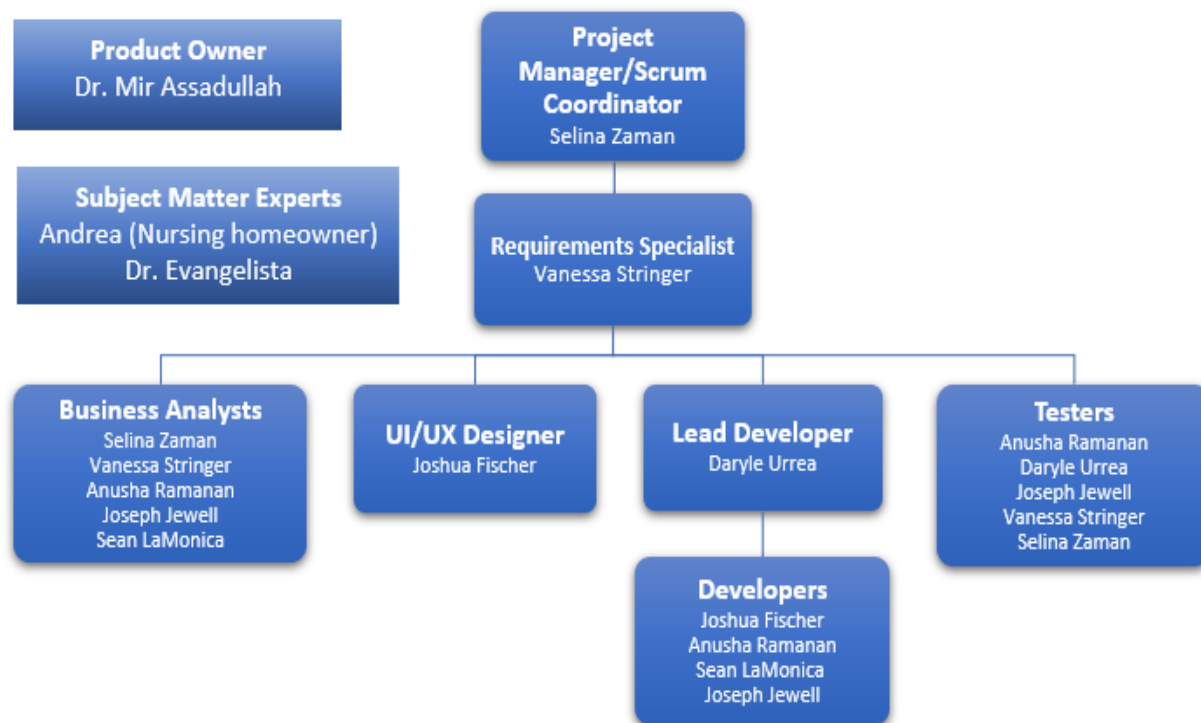


Figure 3 Project Staffing

4.4 Roles and Responsibilities

Table 6 – Team Roles

Team Role	Team Member Names	Responsibilities
Product Owner	Dr. Mir Assadullah	Verifies and ensures the project team is informed about the purpose of the application and the customers who will use the application. They will communicate with the PM to ensure that they are not misguided throughout the iteration process.
Subject Matter Expert (SME)	Andrea (Nursing homeowner) Dr. Evangelista	Subject matter experts for the application who explains how the application should be functioning to achieve the requirements. They will participate in client meetings as they are considered as clients and provide their feedback on how the application could be user friendly and satisfy user needs.
Project Manager	Selina Zaman	Coordinates with the team and monitors the project to ensure successful completion throughout the iteration. Plans, assigns, and tracks tasks, assists team members in their roles and keeps them informed about their responsibilities.
Requirements Specialist	Vanessa Stringer	Gathers requirements and feedback from the project and stakeholders. Coordinates with the PM, business analysts, and UX/UI designer to inform, clarify, and guide with questions on how the product should function and look like.

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Team Role	Team Member Names	Responsibilities
Business Analyst	Selina Zaman Vanessa Stringer Anusha Ramanan Daryle Urrea Joseph Jewell Sean LaMonica	Utilizes project requirements, various studies, research, stakeholder feedback, requirements specialist feedback, and data analytics to ensure the project is moving towards the right direction and meets the requirements goals for successful completion.
UI/UX Designer	Joshua Fischer	Utilizes requirements and feedback from stakeholder and requirements specialists to create design mockups for intended customers. Creates designs that match the requirements, are user friendly, reasonable to the intended users, show simplicity, and is achievable within the given time frame.
Lead Developer	Daryle Urrea	Coordinates and works closely with the development team and the DevSecOps team to build the application. Join the development meetings to review the code and ensure the application is functioning properly. Shares development progress with the PM and the project team members.

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Team Role	Team Member Names	Responsibilities
Developer	Joseph Jewell Vanessa Stringer Selina Zaman Joshua Fischer	Responsible for looking at the requirements and design for the software in order to code, develop, debug and merge all the pieces of the code for the application for mobile use.
Tester	Anusha Ramanan Sean LaMonica Daryle Urrea Joseph Jewell Selina Zaman	Tests the application to verify, validate, and help improve the quality of the application. the developers' project work and creates manual and automated test scripts to ensure the project has no bugs and functions properly based on the requirements.

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4.5 Responsibility Assigned Matrix

FlutteringMind RACI Matrix	Product Owner	Stakeholder	Advisor/ Mentor	Advisor/ Mentor	Project Manager/ Scrum Coordinator	Requirements Specialist/ Business Analyst	UX/UI Designer/ Developer	Lead Developer	Developer / Tester	Tester/ Developer	Tester/ Developer
R: Responsible A: Accountable C: Consulted I: Informed	Dr. Mir Assadullah	Dr. Andrea Evangelista	Roy Gordon	Robert Wilson	Selina Zaman	Vanessa Stringer	Joshua Fischer	Daryle Urrea	Joseph Jewell	Anusha Ramanan	Sean LaMonica
Deliverable	Leadership				Project Team						
Milestone 1											
Project planning	C	C	C	C	R	R	R	R	R	R	R
Software Requirement Specification (SRS)	C	C	C	C	I	I	I	I	I	I	I
Weekly Project/Tech Meeting	I	I	I	I	R	R	R	R	R	R	R
Client/ Project Meetings	R	R	R	R	R	R	R	R	R	R	R
Daily Standup	I	I	I	I	R	R	R	R	R	R	R
Peer Evaluation	I	I	I	I	R	R	R	R	R	R	R
Presentation 1	C	C	C	C	R	R	R	R	R	R	R
Milestone 2											
Technical Design Document	C	C	C	C	I	I	I	I	I	I	I
Weekly Project/Tech Meeting	I	I	I	I	R	R	R	R	R	R	R
Client/ Project Meetings	R	R	R	R	R	R	R	R	R	R	R
Daily Standup	I	I	I	I	R	R	R	R	R	R	R
Peer Evaluation	I	I	I	I	R	R	R	R	R	R	R
First Presentation	C	C	C	C	R	R	R	R	R	R	R
Milestone 3											
Programmer Guide	C	C	C	C	C	R	R	R	R	R	R
Deployment and Operations Guide (Runbook)	C	C	C	C	C	I	I	I	I	I	I
Weekly Project/Tech Meeting	I	I	I	I	R	R	R	R	R	R	R
Client/ Project Meetings	R	R	R	R	R	R	R	R	R	R	R
Daily Standup	I	I	I	I	R	R	R	R	R	R	R
Peer Evaluation	I	I	I	I	R	R	R	R	R	R	R
Project Plan Update	C	C	C	C	R	R	R	R	R	R	R
Milestone 4											
User Guide	C	C	C	C	C	I	I	I	I	I	I
Test Report	C	C	C	C	C	R	R	R	R	R	R
Weekly Project/Tech Meeting	I	I	I	I	R	R	R	R	R	R	R
Client/ Project Meetings	R	R	R	R	R	R	R	R	R	R	R
Daily Standup	I	I	I	I	R	R	R	R	R	R	R
Peer Evaluation	I	I	I	I	R	R	R	R	R	R	R
Project Plan Update	C	C	C	C	R	R	R	R	R	R	R
Final Presentation	C	C	C	C	R	R	R	R	R	R	R

Figure 4 Responsibility Matrix

4.6 Project Tools

The table below shows the tools that the Project will use to produce the mobile application.

Table 7 – Project Tools

Tool	Description
Appian	Appian is a Java based business process management tool used to design visual elements of the application.
Android Studio	Android Studio is an integrated development environment (IDE) for Android application development.
Zoom	Zoom is a cloud- based video conferencing platform used for audio conferencing, video conferencing, meetings, and webinars.
Dart	Dart is a client-side programming language used with flutter to create web and mobile apps.
Flutter	Flutter is Google's open-source UI framework for developing cross platform applications for iOS, Android.
GitHub	GitHub is a distributed version-control platform where users can collaborate on or adopt open-source code projects, share ideas and more.
Google Play Store	A Google mobile application store for Android devices.
App Store	An Apple mobile application store for iOS devices.
Microsoft Teams	Microsoft Teams is a collaboration and video conferencing tool that enables people to communicate more efficiently across several platforms.
Microsoft Word	Microsoft Word is a word processing program that allows for the creation of both simple and complex documents.

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Tool	Description
Microsoft PowerPoint	Microsoft PowerPoint is a virtual presentation software used to facilitate visual demonstrations for group presentations.
Trello	Trello is the visual work management tool that empowers teams to ideate, plan, manage, and celebrate their work together in a collaborative, productive, and organized way.

4.7 Project Storage

GitHub will be used as a tool for the source code repository. All the project related documents will be stored in the SharePoint. It enables the team productivity by leveraging its editing and version history feature.

4.8 Deliverables

Table 8 – Deliverables

Milestone	Deliverable	Description	Deadline
1	Project Plan	Document describing plan of the project on what is required to successfully execute, monitor, control, and complete the project to release to production successfully.	January 22, 2022
	Software Requirements Specification (SRS)	A document that specifies and defines the list of requirements from the client and how it should be done.	
2	Technical Design Document	Document describing the details of the entire application design for the team.	February 5, 2022
	Project Plan Update – adding Software Test Plan	An update made to the Project Plan to include adding the Software Test Plan.	
3	Programmer Guide	A guide intended for future programmers working with the software developed by the team.	March 19, 2022

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Milestone	Deliverable	Description	Deadline
	Deployment and Operations Guide (Runbook)	This Runbook should guide deployment and operation of the application.	
	Project Plan Update (if and as needed)	Any necessary changes made to the Project Plan.	
4	User Guide	A guide intended for future users of the application as an aid to working the application successfully.	April 2, 2022
	Test Report	A summary of testing results, activities, and objectives.	
	Project Plan Update (if and as needed)	Any necessary changes made to the Project Plan.	
	Completed Functioning Application	Memory application for the patient mode shall be completed.	

MemorEZ Combined Project Plan

4.9 Project Schedule/WBS

		Task Moc	Task Name	Duration	Start	Finish	Predecessor	Resource Names
1			STML Project Team FlutteringMind	73.5 days	Sat 1/8/22	Fri 4/1/22		
2			Kick-off meeting	0 days	Sat 1/8/22	Sat 1/8/22		Anusha,Daryle,Joseph,Josh,Sean,Selina,Vanessa
3			Milestone 1	13.25 days	Mon 1/10/22	Mon 1/24/22	2	
4			Project planning	10 days	Mon 1/10/22	Thu 1/20/22		Anusha,Joseph,Josh,Selina,Vanessa
5			Requirements Gathering/Analysis	7 days	Mon 1/10/22	Mon 1/17/22		Daryle,Josh,Sean,Vanessa
6			Weekly tech meeting	1 day	Mon 1/10/22	Mon 1/10/22		Anusha,Daryle,Joseph,Josh,Sean,Selina,Vanessa
7			Software Requirement Specification (SRS)	12 days	Mon 1/10/22	Mon 1/24/22		Josh,Sean,Vanessa,Daryle
8			Milestone 1 Complete	0 days	Mon 1/24/22	Mon 1/24/22	7	
9			Milestone 2	10.13 days	Tue 1/25/22	Fri 2/4/22	8	
10			Technical Design Document	9 days	Tue 1/25/22	Fri 2/4/22		Daryle,Josh,Sean,Selina,Vanessa
11			Add Software Test Plan to the Project Plan	5 days	Tue 1/25/22	Mon 1/31/22		Vanessa,Anusha,Joseph
12			Milestone 2 Complete	0 days	Fri 2/4/22	Fri 2/4/22	10	
13			Milestone 3	36.25 days	Mon 2/7/22	Sat 3/19/22	12	
14			Programmer Guide	12 days	Mon 2/7/22	Tue 2/22/22		Daryle,Joseph,Josh,Sean,Selina,Vanessa
15			Deployment and Operations Guide (Runbook)	22 days	Wed 2/23/22	Sat 3/19/22	14	
16			Milestone 3 Complete	0 days	Sat 3/19/22	Sat 3/19/22	15	
17			Milestone 4	11.13 days	Mon 3/21/22	Fri 4/1/22	16	
18			User Guide	4 days	Mon 3/21/22	Thu 3/24/22		Sean,Anusha,Daryle
19			Test Report	6 days	Fri 3/25/22	Fri 4/1/22	18	Vanessa,Anusha,Selina
20			Milestone 4 Complete	0 days	Fri 4/1/22	Fri 4/1/22	19	

Figure 5 Work Breakdown Structure

MemorEZ Combined Project Plan

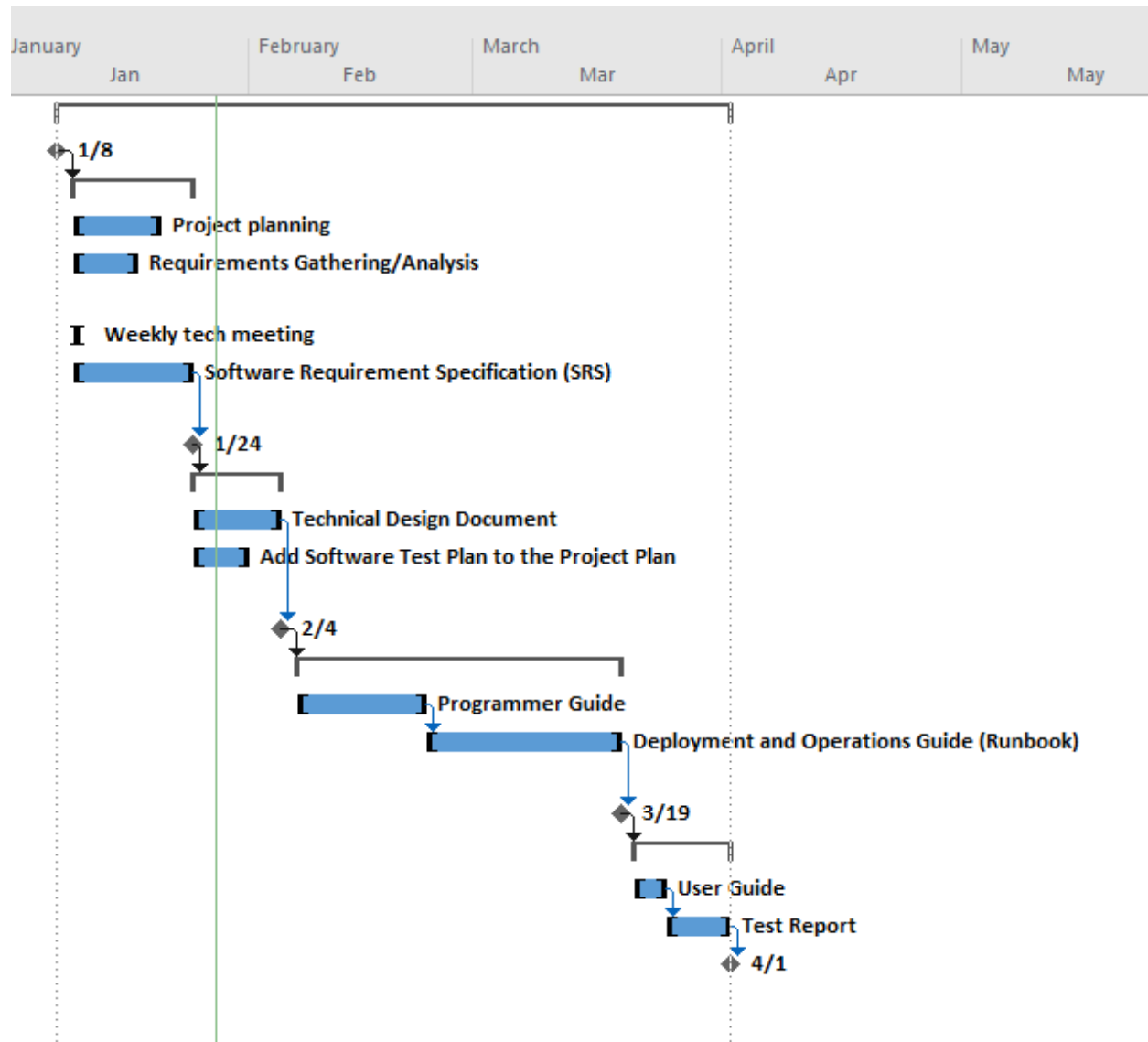


Figure 6 Project Schedule

5. Software Test Plan

Software test plan documents a set of goals, approach, features to be tested and not to be tested, test matrix with the types of testing that shall be covered during the software iteration. In this section, all the plans for software testing of the MemorEZ application shall be covered.

5.1 Purpose

The purpose of this test plan is to define the various Testing approach and overall framework that will drive the testing of the MemorEZ application. A primary objective of testing is to ensure that the system meets the full requirements, including quality requirements (functional and non-functional requirements) and fit metrics for each quality requirement and satisfies the use case scenarios and maintain the quality of the product. The user should find that the project has met or exceeded all of their expectations as outlined in the requirements at the end of the project development cycle.

5.2 Scope

This test plan will hold the types of testing Team FlutteringMind shall perform during and after the development of the MemorEZ application. Team FlutteringMind shall perform unit/widget testing to ensure all the widgets are functioning properly, functional testing to identify all the defects for all the testing on the functional features of the MemorEZ application, integration testing to ensure the application is properly integrated with the local devices, end-to-end testing will help test the start to end flow of application, and regression testing will ensure existing functionality is working as expected along with the newly implemented functionalities.

- **Unit/Widget Testing** – Team FlutteringMind will run unit tests to provide the foundation for testing for MemorEZ application, representing the largest number of tests and a full code coverage. Unit tests will cover the widget testing of the application and tests will be done manually due to the necessity of a user's voice when using the application's features for testing.
- **Functional Testing** – Team FlutteringMind will perform functional testing to check that the Software Requirements Specification document's requirements are met. Team FlutteringMind's demonstration of the product's ability to fulfill the Specification requirements to the satisfaction of the client will be considered complete and successful testing. During the functional testing phase, all relevant quality assurance policies will be implemented.
- **Integration Testing**– Team FlutteringMind will perform a robust testing cycle to help integrate the application with local devices and minimize the defects. This testing will also cover the integration between the patient and caregiver modes. Integration testing will be performed with a combination of manual testing and via flutter.

- **End-to-End Testing** - Team FlutteringMind will also test the functionality and performance of the MemorEZ application under real world-like circumstances and data to replicate the production settings. The goal of this testing will be to simulate what real user scenarios look like from beginning to the end of the test.
- **Regression Testing** - As each new feature and sub feature of the software is built by the team, we will ensure that new code will not impact currently existing functionality of the MemorEZ application. Regression testing will be performed with a combination of manual testing and via flutter.

5.3 Test Items

There are many items to be tested for the MemorEZ application. Items that are within the scope of the project. MemorEZ application shall go through multiple different testing starting with unit testing, integration testing, functionality testing, and user acceptance testing when the application is fully functional.

5.3.1 Test Items to Be Tested

1. **Accessing the mode:** The user in the patient mode shall not require login access but caregiver mode shall require login access.
2. **Onboarding process:** MemorEZ application shall successfully help the user in the patient mode with the onboarding process of 15 seconds voice recording.
3. **Onboarding recording:** MemorEZ application shall not save any recorded voice audio except for the onboarding voice recording.
4. **Speech-to-text:** MemorEZ application shall only recognize the user's voice who is mainly using the patient mode and shall record as the user taps on the microphone icon to record their voice on what they want to record using speech-to-text format.
5. **Voice recognition:** MemorEZ application shall ignore all the other noises and voices in the background except for the unique user's voice.
6. **Listening mode:** MemorEZ application shall allow the listening mode to be activated and deactivated.
7. **Notes:** MemorEZ application shall provide speech-to-text functionality to transcribe notes.
8. **Managing notes:** MemorEZ application shall allow the user in the patient mode to add, edit, update, delete and recall notes.
9. **Trigger words:** MemorEZ application shall replay transcribed text to the user when the user requests with unique phrases or trigger words.
10. **User interface:** MemorEZ application shall have a user friendly, large labeled and functioning GUI that shall provide maximum user experience to the users in the patient mode.
11. **Profile:** MemorEZ application shall allow patient information to be stored in the profile section.

12. **Calendar, reminder, tasks, mood questionnaire:** MemorEZ application shall allow users to view calendar, tasks, reminders, mood surveys.
13. **Managing features:** MemorEZ application shall allow caregivers certain to disable or enable certain features and sub features in the patient mode based on the necessity of the user.
14. **Help:** MemorEZ application shall allow users to utilize two types of help features; “how to” to help users on how a feature functions and helpful links and phone numbers.

5.3.2 Test Items to Not Be Tested

There shall be no remote connection between the patient mode and caregiver mode of the MemorEZ application. Along with that, features and requirements that are not included in the above 5.2.1 will be out of scope and shall not be tested for MemorEZ application.

5.4 Approach

Team FlutteringMind will use GitHub for backlog tracking, defect tracking, test results of expected and actual, reports, expected results, criticality level of the defects and all the requirements of the MemorEZ application of the patient mode. As explained earlier in the scope of testing, below is a list of testing approaches that team FlutteringMind shall take in order to ensure a successful test coverage.

Unit/Widget Testing – Unit/Widget testing will be the foundation of testing that Team FlutteringMind will run for the MemorEZ application. Unit/Widget testing will represent all the tests for a full code coverage. Unit/Widget Testing will be done manually.

Functional Testing – Team FlutteringMind will perform functional testing to check that the Software Requirements Specification document's requirements are met. During the functional testing phase, all relevant quality assurance policies will be implemented and any issues found will be reported.

Integration Testing– Team will perform a robust testing cycle to help integrate the application with local devices and integration between patient and caregiver modes.

End-to-End Testing - Team FlutteringMind will also test the functionality and performance of the MemorEZ application from beginning till the end to ensure the overall flow of testing meets the requirements.

Regression Testing - Team FlutteringMind will ensure that as each new features and sub features of the software is built by the team, we will ensure that new code will not impact currently existing functionality of the MemorEZ application.

5.5 Pass/Fail Criteria

For each requirement specified in Section 2.1.1 , the tester will build test cases. User inputs and relevant outputs will be included in the test cases. Furthermore, the test will pass based on the outcome of the test case and the predefined conclusion. The tester can decide whether a test has failed by reviewing the test output, and if it does not match the predetermined outcome, the test will be marked as failed.

5.6 Defect Severity Levels

1. Low – Any cosmetic defects including spelling mistakes or alignment issues or font casing can be classified under Low Severity.
2. Moderate – The severity of a defect that does not cause the system to terminate but instead causes it to provide erroneous, incomplete, or inconsistent results will be labeled as moderate.
3. Critical - Functional requirement bugs that need to be addressed immediately.
4. Blocker – A blocker defect is one that entirely obstructs or prevents the product/feature from being tested. An example might be in UI testing, when the UI just hangs in one pane or doesn't proceed any farther to trigger the function .

5.7 Risk and Contingencies

1. Voice recordings that are not properly transcribed may mislead the user when played back later on.
2. The user might tap on the microphone icon in the application to start recording at unwanted times which will lead to increased battery usage on the device.
3. The user might not remember to tap off the microphone to deactivate the listening mode of the application.

5.8 Test Matrix

5.8.1 Unit Testing (Widget)

Fluttering Mind team will be developing the unit test cases for the below features

1. Logging into the system through onboarding process
2. Accessing the application
3. Completing the mood task
4. Viewing the scheduled/assigned tasks list
5. Viewing the scheduled events or appointments in the calendar
6. Viewing the self-profile in read only mode
7. Viewing the contact information in read only mode
8. Viewing the care team information in read only mode
9. Viewing the preferred transportation services in read only mode
10. Accessing settings section
11. Accessing the Help page
12. Viewing the completed tasks
13. Searching a task or a remainder using keywords
14. Recording a note by using speech-to-text feature
15. Using trigger words to start and stop recording a note
16. Add, Modify and Delete and Recall Notes
17. Activating/Deactivating listening mode
18. Sending SMS to the caregiver mode based on the mood/health questionnaire

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5.8.2 Functional Testing

(STML Patient Test Cases)

5.8.2.1 Test Case 1

Test Number	1
Feature Being Tested	3.1.1 On-boarding voice assistance
Test Process	1. The actor opens the app for the first time and selects the “Patient Option” 2. The on-boarding process should record the user's voice for 15 seconds
Expected Result	The users voice should be recorded
Assumptions	The user must be a first-time registered user to login to the application.
Actual Result	
Pass/Fail	

5.8.2.2 Test Case 2

Test Number	2
Feature Being Tested	3.1.2 Accessing the application
Test Process	1. The actor opens the app
Expected Result	The app displays the STML patient home screen
Assumptions	The user must be registered to use the application with all permissions previously approved on the device.
Actual Result	
Pass/Fail	

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5.8.2.3 Test Case 3

Test Number	3
Feature Being Tested	3.1.3 Completing a mood task
Test Process	1. The actor selects health check from the active task list 2. The actor selects a mood icon
Expected Result	The task is marked as completed
Assumptions	The user must be assigned or scheduled a Health Check (mood) task from the admin/caregiver mode.
Actual Result	
Pass/Fail	

5.8.2.4 Test Case 4

Test Number	4
Feature Being Tested	3.1.4 Viewing and completing a task or reminder
Test Process	1. The actor navigates to the Tasks screen 2. The actor selects a task to complete 3. The actor marks the task as complete
Expected Result	The system marks the task as complete and closes the task
Assumptions	The user must be assigned or scheduled tasks from the admin/caregiver mode.
Actual Result	
Pass/Fail	

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5.8.2.5 Test Case 5

Test Number	5
Feature Being Tested	3.1.5 Viewing the Calendar
Test Process	1. The actor selects the tasks button 2. The actor selects the calendar tab
Expected Result	The system displays the calendar feature
Assumptions	The user must be assigned or scheduled events or appointments
Actual Result	
Pass/Fail	

5.8.2.6 Test Case 6

Test Number	6
Feature Being Tested	3.1.6.1 About Me
Test Process	1. The actor selects the profile button
Expected Result	The system displays the about me section of the profile
Assumptions	The user must have the profile completed from the caregiver mode
Actual Result	
Pass/Fail	

5.8.2.7 Test Case 7

Test Number	7
Feature Being Tested	3.1.6.2 Contacts
Test Process	1. The actor selects the profile button
Expected Result	The system displays the contact me section of the profile
Assumptions	The user must have the profile completed from the caregiver mode
Actual Result	
Pass/Fail	

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5.8.2.8 Test Case 8

Test Number	8
Feature Being Tested	3.1.6.3 Care Team
Test Process	1. The actor selects the profile button
Expected Result	The system displays the care team section of the profile
Assumptions	The user must have the profile completed from the caregiver mode
Actual Result	
Pass/Fail	

5.8.2.9 Test Case 9

Test Number	9
Feature Being Tested	3.1.6.4 Transportation
Test Process	1. The actor selects the profile button
Expected Result	The system displays the transportation section of the profile
Assumptions	The user must have the profile completed from the caregiver mode
Actual Result	
Pass/Fail	

5.8.2.10 Test Case 10

Test Number	10
Feature Being Tested	3.1.6.5 Settings
Test Process	1. The actor selects the profile button
Expected Result	The system displays the settings section of the profile
Assumptions	The user must have the profile completed from the caregiver mode
Actual Result	
Pass/Fail	

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5.8.2.11 Test Case 11

Test Number	11
Feature Being Tested	3.1.7 Accessing the Help Page
Test Process	1. The actor selects the Help button
Expected Result	The system displays contact options
Assumptions	The user must have contacts assigned to help page options from the admin/caregiver mode
Actual Result	
Pass/Fail	

5.8.2.12 Test Case 12

Test Number	12
Feature Being Tested	3.1.8 Viewing completed tasks
Test Process	1. The actor selects the tasks button 2. The actor selects the history tab 3. The actor selects a completed task
Expected Result	The system displays a read only version of the completed task
Assumptions	The user must have tasks that have been marked as complete
Actual Result	
Pass/Fail	

5.8.2.13 Test Case 13

Test Number	13
Feature Being Tested	3.1.9 Search Function
Test Process	1. The actor selects the tasks button 2. The actor enters text in the search text field
Expected Result	The system displays a list of tasks and reminders that match the search
Assumptions	The user must be assigned or scheduled a task or reminder from the admin/caregiver mode
Actual Result	
Pass/Fail	

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5.8.2.14 Test Case 14

Test Number	14
Feature Being Tested	3.1.10.1 Using the Microphone button
Test Process	<ol style="list-style-type: none"> 1. The actor selects the microphone button 2. The actor selects the second microphone button and begins to speak 3. The actor stops speaking and/or releases the microphone 4. The actor selects the save button
Expected Result	The system saves the notes
Assumptions	The user must have a device with a microphone and permissions to access device resources granted
Actual Result	
Pass/Fail	

5.8.2.15 Test Case 15

Test Number	15
Feature Being Tested	3.1.10.2 Using Trigger words
Test Process	<ol style="list-style-type: none"> 1. The actor says a start Trigger word 2. The actor says a stop Trigger word 3. The actor deactivates listening mode by selecting the microphone button or by voice prompt.
Expected Result	The system save
Assumptions	The user must have a device with a microphone and permissions to access device resources granted
Actual Result	
Pass/Fail	

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5.8.2.16 Test Case 16

Test Number	16
Feature Being Tested	3.1.11.1 Add Note
Test Process	<ol style="list-style-type: none"> 1. The actor selects the notes button 2. The actor selects the add note button 3. The actor enters a note 4. The actor saves the note
Expected Result	The system saves the note
Assumptions	None
Actual Result	
Pass/Fail	

5.8.2.17 Test Case 17

Test Number	17
Feature Being Tested	3.1.11.2 Modify Note
Test Process	<ol style="list-style-type: none"> 1. The actor selects the notes button 2. The actor selects a note 3. The actor uses the device keyboard to modify the note and selects the save button.
Expected Result	The system saves the note
Assumptions	None
Actual Result	
Pass/Fail	

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5.8.2.18 Test Case 18

Test Number	18
Feature Being Tested	3.1.11.3 Delete Note
Test Process	1. The actor selects the notes button 2. The actor selects a note 3. The actor selects the delete button
Expected Result	The system deletes the note
Assumptions	The system must have previously entered note stored
Actual Result	
Pass/Fail	

5.8.2.19 Test Case 19

Test Number	19
Feature Being Tested	3.1.11.4 Recall Note
Test Process	1. The actor activates the search feature and speaks.
Expected Result	The System displays and plays back related notes
Assumptions	The system must have listening mode activated.
Actual Result	
Pass/Fail	

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5.8.2.20 Test Case 20

Test Number	20
Feature Being Tested	3.1.12.1 Using Trigger Word
Test Process	1. The actor says a start recording trigger word “Can you say that again” 2. The actor says a stop recording trigger word “Got it” 3. The actor says a playback notes trigger word “Talking about”
Expected Result	The system starts and stop recording based on the trigger word
Assumptions	The user must have a device with a microphone and permissions to access device resources granted.
Actual Result	
Pass/Fail	

5.8.2.23 Test Case 21

Test Number	21
Feature Being Tested	3.1.13.1 Activating Listening Mode
Test Process	1. The actor taps the microphone or says a trigger word
Expected Result	The system activates listening mode and displays an indicator
Assumptions	The user must have a device with a microphone and permissions to access device resources granted. An Activation Trigger Word must be assigned.
Actual Result	
Pass/Fail	

5.8.2.24 Test Case 22

Test Number	22
Feature Being Tested	3.1.13.2 Deactivating Listening Mode
Test Process	1. The actor taps the microphone or says a trigger word
Expected Result	The system deactivates listening mode ,turns off the device microphone, and stop listening to speech
Assumptions	The user must have a device with a microphone and permissions to access device resources granted. An Activation Trigger Word must be assigned.
Actual Result	
Pass/Fail	

5.8.3 Integration Testing

This testing covers the integration scenarios between the caregiver and patient mode. Integration testing is conducted to evaluate the compliance of a system or component with specified functional requirements.

5.8.4 End-to-End Testing

The End-to-end (E2E) test will help to ensure all the integration features and their intended functionality are working as expected. The quality control team will develop a list of E2E test cases after the application is developed, to cover the entire functionality of a feature set that a normal user would use to interact with the application.

5.8.5 Regression Testing

The regression testing for the MemorEZ application will be performed using flutter and manually. The goal of the regression testing will be to verify and validate that all the existing functionalities are functioning properly and nothing is breaking after the new functionalities are added to the application.

MemorEZ Combined Project Plan

6. Appendices

6.1 Project Schedule/WBS

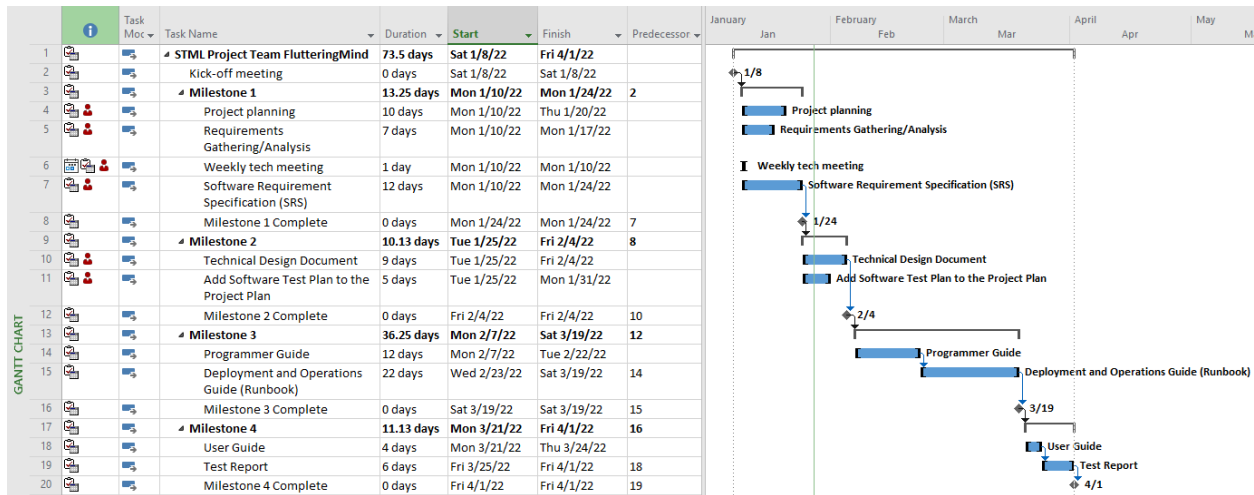


Figure 7 Project Schedule and Work breakdown Structure

6.2 Change Control Board

Name	Role	Responsibility
Dr. Mir Mohammed Assadullah	Stakeholder	Final approval or denial or proposed change
James Eble	General Project Manager	Approval or denial of proposed change; escalates proposed change to stakeholder if approved
Selina Zaman	Team FlutteringMind Project Manager	Approval or denial of proposed change for team FlutteringMind; escalation of proposed change to general project manager if approved
Brian Avadikian	Team RememberAll Project Manager	Approval or denial of proposed change for team RememberAll; escalation of proposed change to general project manager if approved

6.3 Change Request Form

Change Request Form			
Project Name			
Requested By		Date	
Request No.		Name of Request	
Change Description			
Change Reason			
Impact of change			
Proposed Action			
Status	In Review	Approved	Rejected
Approval Date			
Approved by			

Change Request Form (Change Request Template, 2018)

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Section 3 – MemorEZ Caregiver Mode

Team RememberAll

Revision History for Caregiver Mode

Revision Number	Date	Description	Approved By
1.0	01/22/2022	Initial Release	Brian Avadikian
2.0	01/28/2022	Incorporating feedback after JAD requirements session and Milestone 1 feedback. Updates in the following sections: 2.3, 2.5, 6.1, 2.6, 4.4, 4.6	Brian Avadikian
3.0	02/05/2022	Incorporating some feedback after Milestone 1 submission, Inclusion of Project Plan.	Brian Avadikian
4.0	3/18/2022	Inclusion of WBS, update of Backlog Management Process, editorial corrections. Updated defect management process to reflect our practices.	Brian Avadikian

1 Introduction

1.1 Background

As a requirement in the UMGC's Master's Program for IT: Software Engineering, students are required to complete a Capstone Course designed as an "Examination of the tools, skills, and techniques of software engineering" (UMGC, 2021). All the students in this Spring 2022 cohort have been divided into teams to improve upon the work of the Fall 2021 cohorts' application titled "Memory Magic". "Memory Magic" is an application designed to assist users with short-term memory (STM) challenges and their caregivers. This cohort's adaptation of "Memory Magic" will be called MemorEZ.

STM refers to a system in the brain that retains a piece of information for approximately 30 seconds (Cascella & Khalili, 2021). STM plays a vital role in shaping our ability to function. As a result, short-term memory loss (STML) can make day-to-day activities such as self-care, scheduling, and eating difficult. It is challenging for a person with STML to live independently. Along with incorporating new requested features, RememberAll's objective is to simplify existing features and enhance the user experience for people with STML and their caregivers.

Our team is composed of 7 self-arranged UMGC students gathered from a pool of 16. The purpose of this team is to satisfy the requirements of SWEN 670 while developing the additions and improvements to "Memory Magic". This project will be active from 1/8/2022 through 4/6/2022. As part of our resources to complete this project, the University of Maryland Global Campus has provided our team with access to a professor, three mentors, and a subject matter expert (SME) on health care / short term memory (STM).

1.2 Statement of Need

This project aims to add additional functionality to the short-term memory enhancer mobile application developed to assist people with STML and their caregivers in navigating their daily activities.

1.3 Vision Statement

We envision developing a user-friendly application that will improve the capacity of a caregiver in monitoring someone with STML in a few key areas such as appointment/lab attendance, memory test recording, and hygiene habits. We intend for MemorEZ to provide value for its users and maximize the educational experience of both development teams.

2 Project Assignment

2.1 Project Scope

This development effort aims to reduce the amount of time spent by people in organizing and documenting repetitive daily tasks that may be challenging to those suffering with STML. To accomplish this, United Global Master Coders will modify previous features and incorporate feedback received from previous stakeholders to upgrade the usability and benefit of the flutter-dart mobile application “Memory Magic”. UMGC is tasked with building on / productionizing the development efforts of the previous semester and issuing the final product under the name MemorEZ. MemorEZ will address any evolving feedback received relating to the features/look and feel of the application through the change management request process and be published to the Android and Apple application market places.

RememberAll is specifically tasked with developing and implementing the requirements/features associated with the caregiver mode of the application. There are some areas where the STML user mode interfaces with the caregiver mode, so both teams will work together in these efforts. To address this exception, a small group has been established with representatives from both teams and both PM’s. This group will be responsible for coordinating development that requires input from both teams. RememberAll is also responsible for all items described in Section 0 of this plan.

Functionality of the application which is for the STML user only is outside of the scope of RememberAll’s project. Additionally, there will be no testing of the application with STML users. Lastly, application benchmarking/performance testing will be out of scope for this development effort.

2.2 Project Objectives

The objective is to deliver an easy to use, working product by the end of Milestone four on April 2, 2022. All members of the team will take part in developing the application. Each team member has a primary role as well as a helping role. The project main milestones and product delivery times are indicated in Section 0.

RememberAll will present the final milestone presentation to the stakeholder and product owner at the presentation session on April 2, 2022. RememberAll will deliver the following products in their final version at Milestone four.

- iOS and Android Deployable Flutter Dart Application
- Project Plan
- Software Requirements Specification (SRS)
- Technical Design Document (TDD)
- Deployment and Operations Guide (Runbook)
- Programmer Guide
- User Guide
- Test Report

2.3 Project Requirements

Functional Requirements:

The raw requirements statements for this project were methodically collected by RememberAll into a single document (RememberAll, 2022) in order to ensure that no statement was overlooked. This document included e-mail correspondence from the professor, the previous stakeholder Andrea, discussion from the mentors, and transcriptions of the professors' voice in his meetings with the teams.

From there, the requirements were serialized and duplicates were removed. RememberAll conducted a JAD session with these requirements to obtain concurrence, or clarification on each one. The resulting list of requirements and the features that are planned to address them are contained in the RememberAll SRS document (RememberAll, 2022).

Table 1 presents the requirements for MemorEZ with a focus on the Caregiver Mode of the Application.

MemorEZ Combined Project Plan

Table 1: System Requirements

Requirement	#	Description
RE- 1		The application shall retain the AI and NLP features developed over previous semester.
RE- 1.1		The AI and NLP related aspects that are background or unrelated to UI/UX can remain as-is.
RE- 1.2		The feature in the last iteration where it asks questions and answers questions will remain as a feature that can be turned on or off
RE- 1.3		The application shall support NLU interaction that integrates with an Amazon Lex Natural Language understanding system.
RE- 1.4		The application shall retain the NLP engine that was used in the last iteration from the Fall 2021 semester.
RE- 2		The application shall allow for a caregiver to remove features from view in the STML User mode of the application.
RE- 2.1		The application shall allow the caregiver mode to enable or disable certain features for the STML User mode.
RE- 3		The application shall allow for documentation of dates of appointments and lab work that the user (STML User) requires each month for caregiver reference.
RE- 4		The application shall have two operational modes: a STML User mode and a caregiver mode.
RE- 5		The application shall store and display information about the user (STML User) including the names and phone numbers of the physician care team, insurance information, emergency contact(s) name(s) and phone number(s), and the name(s) and phone number(s) for the Relatives in both the STML User and caregiver modes.
RE- 5.1		The application shall store and display information in the Profile section about the user (STML User) including past medical history, medications, and allergies.
RE- 6		The application shall provide a link to a short-term memory test in caregiver mode.
RE- 6.1		find a memory test and see if you can put a couple of those quizzes in there for that person and keep track of how the person is scoring
RE- 7		The application shall have labeled buttons.
RE- 8		The application shall have a streamlined process for taking and sending pictures.
RE- 9		The application shall use a 12-hour clock time format using AM and PM.
RE- 10		The application shall not implement a database.
RE- 11		The application shall opens in "STML User" as default mode after installation
RE- 12		The application shall support reminder notifications with customizable text phrasing.
RE- 12.1		The application shall ask the user direct questions specified by a caregiver about how the STML User is feeling requiring a yes or no response from the user.
RE- 12.2		The application shall have an option to send a reminder notification for the user (STML User) to drink water.
RE- 12.3		The application shall have an option to send a reminder notification for the user (STML User) to eat.
RE- 12.4		The application shall have an option to send a reminder notification for the user (STML User) to stand up and walk.
RE- 12.5		The application shall provide data from the installed device sensors to determine if the STML user actually walks after a notification
RE- 12.6		The application shall have an option to send a message to ask how the user (STML User) is feeling and request a response which is sent to the caregiver via SMS.
RE- 12.7		The application shall delete reminders from the checklist after the checkbox has been marked.
RE- 12.8		The application shall allow for user relevant and personalized notifications.
RE- 13		The application shall prompt the user to permit the application to access their microphone, camera, and storage resources.
RE- 14		The application shall toggle to listening mode when the user taps on the microphone button.
RE- 15		The application shall record the user's speech and transcribe into a note, then save the transcribed notes on the user's device.
RE- 16		The application shall allow the user to view and sort a list of notes by date and group the notes by subject category.
RE- 17		The application shall allow the user to add a new note as well as modify and delete existing notes.
RE- 18		The application shall have a functioning Graphical User Interface (GUI) with large, user-friendly icons for the STML Users.
RE- 19		The application shall allow notes to be searchable by keyword and date.
RE- 20		The application shall provide a Help menu.
RE- 21		The application shall allow users the ability to increase note security by leveraging the device's existing security features such as a PIN, finger print, or facial recognition.
RE- 22		The application shall have a language settings option to support language internationalization.
RE- 22.1		The application shall allow the caregiver mode to change the application language.
RE- 22.2		The application shall support speech-to-text transcription from the user in multiple languages.
RE- 23		The application shall include a calendar.
RE- 24		The application shall provide links and/or contact for free government resources to the caregiver

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Nonfunctional Requirements:

1. The MemorEZ application shall be developed using Flutter, an open-source framework by Google.
2. Dart programming language shall be used to develop the MemorEZ application.
3. The application code shall be placed on GitHub, so that team members may readily access it.
4. The code shall be merged and compiled for submission by DevSecOps (DSO).
5. Testing shall take place concurrently with development to ensure that the project development is fulfilling the plan and meeting requirements.

2.4 Project Assumptions

- The mobile device will have access to the internet.
- The application will be used by people with mild STML and/or their caregivers.
- The labor cost of developing the app will remain within the estimated labor charge.
- The application shall be developed on the google open-source framework Flutter, using the Dart language, as a mobile application for Android and iOS smartphones.
- Development team size will not change during the duration of project completion.
- Development team will use an agile software development methodology that allows for incremental development.
- RememberAll will be meeting weekly to connect and discuss project status.
- Team members shall communicate regularly using MS Teams.
- Team members shall use GitHub as a platform for storing, tracking, and collaborating media.

2.5 Product Approval/Acceptance Criteria

This project plan is prepared to deliver a working product that facilitates caregivers' ability to help people with STML. Each team member shall evaluate the product progress during weekly meetings. Project managers shall check in with developers and reach out to advisors and SMEs as needed to keep the project on track. In addition, the reviewed product progress shall be evaluated by the advisors and product owner on the first and fourth milestone presentation until the final product approval.

The app will have 2 modes, patient and caregiver. RememberAll shall develop the caregiver section of the user interface. The team has decided to combine the concepts of administrator and caregiver to simplify the application. As a result, caregivers and administrators of people with STML will interact with the same interface in the application. At this time, RememberAll is planning to develop the caregiver UI based on the following acceptance criteria and definitions.

Caregiver – Relative, Nurse, Owner of Nursing Home, Care Service or Doctor

STML user – An individual with mild stage STML as per Mini-Mental State Exam (Arevalo-Rodriguez et al., 2020).

The detailed requirements and associated acceptance criteria are presented in RememberAll's Software Requirements document (RememberAll, 2022). The requirement acceptance criteria was modified to follow the Specific, Measurable, Attainable, Relevant, Time-based (SMART) goal.

1. The application shall have a UI dedicated to the caregiver.
 - **Acceptance Criteria:** The app should display clearly that the user is in caregiver mode. A caregiver should be able to view "caregiver mode" when in caregiver mode.
2. The application should allow the caregiver to register using a phone number, username, and password.
 - **Acceptance Criteria:** The application should display an input box to enter a phone number, username, password, and a save button to save for the next time login.
3. The application should allow the caregiver to login into the application.
 - **Acceptance Criteria:** The caregiver should be allowed to navigate to the home page when entering the username and password on the application login page.

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4. The app should allow the caregiver to toggle between the caregiver and STML user mode.
 - **Acceptance Criteria:** The application should have a toggle button for the caregiver to switch modes.
5. The caregiver mode of the application should have a patient's profile page.
 - **Acceptance Criteria:** An application should allow the caregiver to click a profile button that navigates to a patient profile page.
6. The caregiver should be able to add and edit patient profile.
 - **Acceptance Criteria:** An application should allow an editable page when the caregiver navigates to the patient profile page.
7. The application shall provide a link to a short-term memory test.
 - **Acceptance Criteria:** A link to an outside website will be displayed from the page of the application.
8. The application shall allow the caregiver to change the application's settings.
 - **Acceptance Criteria:** The caregiver mode of the application opens a setting page when caregiver clicks the setting button from the home page. The setting page provides a setting page with A reset button that will be included for the language selection to switch back to the default language easily.
9. The application shall set the time for reminder using a 12 am/pm hours
 - **Acceptance Criteria:** All-time display in the UI of the application will use 12 am/pm clock
10. Caregiver should be able to access STML user's completed tasks and activities
 - **Acceptance Criteria:** The caregiver should be able to see tasks when clicked task from the home buttons menu. Once the patient checks the reminder, the activity should be crossed out from the caregiver's list.
11. Caregiver should be able to create and view STML user's appointments.
 - **Acceptance Criteria:** A caregiver should be able to open the calendar from the calendar button on the home page and add and edit events.
12. Caregiver should be able to search events on the app.
 - **Acceptance Criteria:** The app should provide a search bar where caregiver can type a search keyword.
13. Caregiver should be able to send health check tasks to the STML user
 - **Acceptance Criteria:** The app should be able to display health check tasks when STML user clicks the task button from the home page

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2.6 Project Cost

The project cost is considerably low due to the usage of the Google-developed open-source framework, flutter. The salary cost for involved professionals is calculated based on Salary.com reported median hourly wage in the United States as of December 2021 (Salary Calculator, n.d.).

The labor cost is calculated for each professional involved in the project, estimated time approximately 3 hours a day, five days a week, for 11 weeks.

- Project Manager: \$64.00hr
- Business Analyst: \$31.00hr
- Lead Developer: \$66.00hr
- Developer (3): \$46.00hr
- Tester (2) \$34.00hr

Labor is estimated based on a 3hr workday, 5 days a week on a 11 week-long project.

Table 2: Project Costs

Category	Total Estimated Costs
Labor	\$60,555
Software	\$0
Hardware	\$0

3 Risk Analysis

3.1 Risk Framework

RememberAll believes that managing risks throughout the lifecycle of project is a key ingredient for the success of the project. Accordingly, at the planning stage of the project enough emphasis should be given to identify potential risks and set up a proactive plan that will address them.

Understanding the risk management lifecycle will help RememberAll to master the methods designed to anticipate adverse events that could negatively impact the project. RememberAll will plan an appropriate response should these items actually arise. Being able to develop alternative solutions to reach our objectives under all circumstances will be a priority for RememberAll in regard to risk management (Gisclard-Biondi, 2021).



Figure 1: The 5 steps of the risk lifecycle (Gisclard-Biondi, 2021).

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1. Risk Identification

- List the different risks the project could face during its execution,
- Define their characteristics considering the context in which the project will take place

2. Risk Assessment

- Assess the risk level based on the possible impact
- Consider the probability of occurrence
- Assign degree of importance and priorities

3. Treatment

- Develop and assign a risk mitigation plan based on control strategies
- Avoid the risk
- If the risk can't be avoided, mitigate the adverse effect produced

4. Monitoring

- Monitor the risks throughout the project lifecycle
- Update the Risk Register regularly

5. Reporting

- Keep and save the analysis record to make it available for future projects

3.2 Risk Assessment

Software risk assessment is a process of identifying, analyzing, and prioritizing risks. In general, there are large, medium, and small software projects that each of them can be influenced by a risk. Therefore, it needs a unique assessment process of the possible risks that may cause failure or loss of the project if they occur (Sharif, M. A. 2011).

In this section, team RememberAll adopt a risk assessment that can attribute the reduction of potential risks by identifying, evaluating and mitigating a plan. In the coming section a detail discussion of MemorEZ application risk and vulnerabilities and risk matrix to help to identify potential risks.

A Risk Matrix is an indication system assessing the probability of a risk occurring against the severity of the risk outcome (Roseke, 2018). We have used a risk matrix and a risk register to indicate the likelihood that an event will occur and the severity/impact of the consequences for the MemorEZ app development. The impact of risk is defined in the five following categories:

Negligible	risk is assigned if the threat has no significant impact on the project's health.
Minor	risk has a small potential for negative consequences but won't significantly impact the overall project.
Moderate	risk is when the threat may cause negative consequences in the project's future.
Significant	risk is assigned when the risk results in substantial negative consequences that will seriously impact the project's success.
Severe	risk is assigned when the risk will result in highly negative consequences, as in fatal errors that can stop the application performance or affect the daily activity of the application. This is a risk level that would be a high priority to address.

The likelihood of risk occurring is defined using the following terms:

High	risk is assigned when the application is in fatal danger. This level requires immediate attention.
Very likely:	Risks that are highly likely to occur. These are the risks that get priority addressed.
Likely:	Risks that are almost certain to occur.
Possible:	Risks with 50% chance of occurring.
Seldom:	Uncommon risks that have a very low chance of occurring

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Unlikely: Risks that arise extremely rarely with almost zero probability of occurring.

The risk levels are assigned based on the four categories:

Low: The consequences of risk are minor, and it is unlikely to occur.

Medium: Risks are somewhat likely to occur. If possible, these risks need to be prevented from happening but should not impact the project significantly.

High: Serious risks that have both significant impacts and are likely to occur

Extreme: Risks that have severe consequences and are very likely to occur. Therefore, these are a high priority that must be dealt with immediately.

Table 3: Standard Risk Matrix (edet, 2018)

		Impact				
		Negligible	Minor	Moderate	Significant	Severe
Likelihood	Very Likely	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	Extreme	Extreme	Extreme
	Possible	Low	Medium	Medium	High	High
	Seldom	Low	Medium	Medium	Medium	High
	Unlikely	Low	Low	Low	Medium	Medium

3.3 Risk Register

A risk register that documents identified risks, likelihood of occurrence, the impact on project progress, and mitigation plans is presented below. RememberAll shall monitor and review risks during application development to identify the potential risk and regularly update the risk register. The mitigation plan shall be designed by team members collaborating with subject matter experts.

Table 4: Risk Register

Risk ID	Risk	Likelihood	Risk Owner	Possible Effect on the project	Impact	Mitigation Plan
RS-1	Project plan and SRS are not well defined	Possible	PM	Delay project delivery.	High	Take enough time and brainstorm with the team to identify complete project plan and SRS, update consistent with modifications during updates
RS-2	Team lacks the skill to fulfill the requirement	Unlikely	PM	Compromise the delivery time and quality of the application	Medium	Encourage team members to sign up for the task they can contribute the most and create an environment where team members can help each other.
RS-3	Misunderstanding and incomplete requirements	Seldom	PM	Poor quality product, delays caused by time spent specifying	Medium	Stay connected with the stakeholders and assign multiple checkpoints during the project life.
RS-4	Time constraint to complete the required products within the allocated milestone	Possible	PM	Unfinished product that is not ready for production	Medium	Create a communication media where team members update their progress and request help.
RS-5	Missing or incorrect tools to develop the product	Seldom	PM/ Developer	Poor quality product	Medium	Identify the required tools at the beginning of the project and plan accordingly with stakeholders.
RS-6		Unlikely	PM/	Delay of product delivery time	Low	Maintain good communication with the team members

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Risk ID	Risk	Likelihood	Risk Owner	Possible Effect on the project	Impact	Mitigation Plan
	Team members availability		Team Members			and identify member's availability on a routine basis / reduce single points of failure.
RS-7	System development and integration complexity	Possible	Developer	Non-working product	High	Identify system complexity at the early stages of the project and discuss it with the Team. Set priorities for each complexity.
RS-8	Non-Familiarity with project tools/frameworks	Likely	PM	Non-working product	Extreme	To mitigate this, our team strategize to match developer role to the relatively experienced developers in other technologies to shorten the learning curve of the new technologies. The PM has also tasked developers with learning early at the expense of personnel to complete documentation.

Table 4 is extended by Table 5 below in specific instances where threats to/vulnerabilities of the MemorEZ application exist. Risk indicates the potential loss or damage when a threat exploits a vulnerability.

Vulnerability is the weak side of the application open for attackers to exploit the application system. A threat refers to an incident that can potentially harm the application system (Watts, 2020). The objective is to prevent threats from escalating to risks exploiting vulnerabilities.

Table 5: Risks and vulnerabilities

Risk	Vulnerability	Threat
Lack of authentication and authorization	Sensitive patient profile and information exposure	Information exposure/data loss
Links to compromised resources	Device exposed to malwares	Application crashes / Application functionality reduces

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Risk	Vulnerability	Threat
Improper application configuration	Improper configuration could interfere with application feature usability	Compromised service availability
Failure to update device regularly	Device could be exploited by hackers	Identity theft, loss of confidential data
Interception of Personally Identifiable Information (PII)	Transfer of unencrypted data over the internet	Exposure to Identify theft

4 Organization of the project

The project was established by Professor Mir Assadullah with a kick-off e-mail welcoming us to the capstone course, outlining the general team, and introducing us to three mentors. From there, the full class of 16 students were expected to self-organize into three teams. The leadership roles in these teams were selected from the pool of 16 students by the mentors. After the leadership positions were filled, the leader of each team began forming its roster so that each team had a balanced compliment of developers and business analysts. The Org chart in Figure 2 depicts the rosters for each of the development teams, the members of the DevSecOps team, the three mentors, and the two main stakeholders.

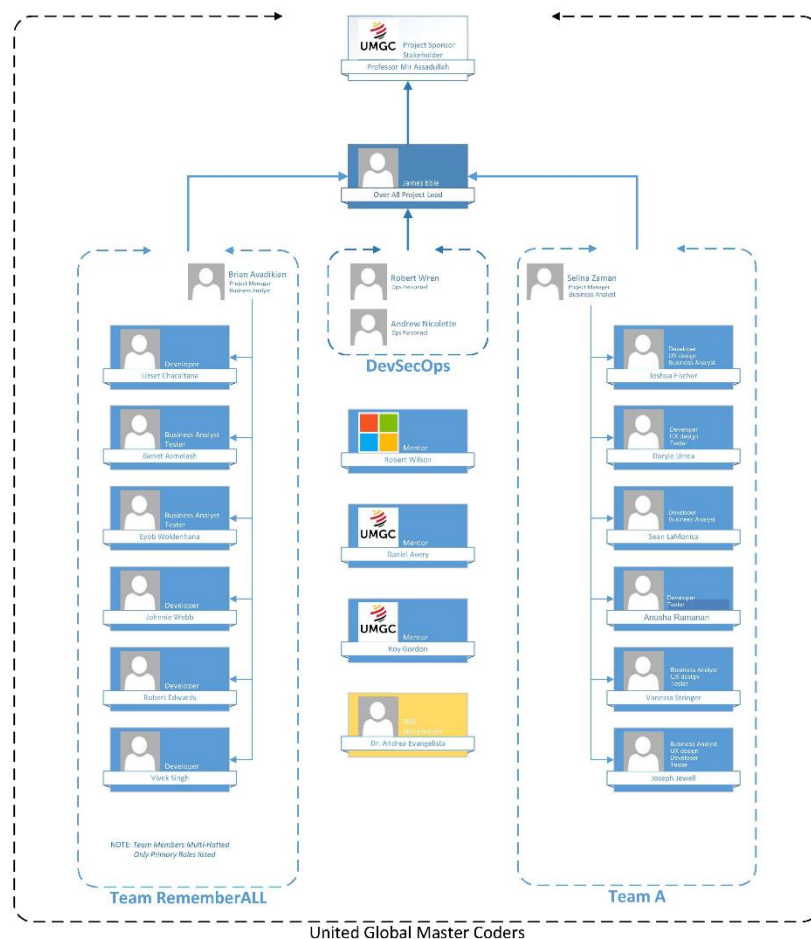


Figure 2: United Global Master Coders - Org Chart

At the suggestion of the Mentors, a Co-PM arrangement has been discussed amongst the members of RememberAll, and Genet Asmelash has elected to take on that role. This arrangement will support Genets leading the group in the event the other Co-PM is not available, and it empowers them to create and lead subgroups as necessary.

4.1 Stakeholder Identification, Management and Engagement

A basic list of stakeholders and mentors was compiled by RememberAll's PM based on the early e-mail communications from the professor and the statements made during the MS Teams kickoff conference call. From there, a list was compiled in the RememberAll wiki in MS Teams as the contact info and communication preferences were determined.

Mentors / Stakeholders	
Professor Mir Assudullah: Time Zone - EST	<ul style="list-style-type: none"> • Communication should ideally begin with the overall PM, then to the mentors, and up to the professor if necessary • Responds to E-mail within 1-2 days • Responsive on Teams
Roy Gordon: Time Zone - EST	<ul style="list-style-type: none"> • uspsrgordon@aol.com • (301)366 8852 • Responds quickly to e-mail
Rob Wilson: Time Zone - Pacific	<ul style="list-style-type: none"> • rwilson@umgc.dev • Responds within a day using Teams
Daniel Avery: Time Zone - TBD	<ul style="list-style-type: none"> • daniel@danielavery.net • Mentor for developers - can support with emulator setup in android studio • Responds quickly in Teams
Dr.Andrea Evangelista: Time Zone - TBD	<ul style="list-style-type: none"> • To minimize confusion and over-contact, communications with Dr.Evangelista should be coordinated through James Eble • The Mentors and Professor shall be included on all correspondence with Dr.Evangelista • andrea.evangelista@mclaren.org

Figure 3: List of Project Stakeholders

The first step in RememberAll's plan for stakeholder management was to collect this information into this one central location. From there, each of the stakeholders preferred means of engagement was noted, including any additional information about the proper way to conduct or coordinate that engagement.

To effectively engage the stakeholders throughout the project, the needs and interests of the stakeholders had to be accounted for. For this project, it is RememberAll's assessment that there are four main groupings of stakeholders with a large influence over the likelihood of project success: the Professor, the SME Dr.Evangelista, the mentors Roy / Rob / Daniel, and the students distributed throughout the three teams/management. Unfortunately, due to time constraints, direct users of the software such as care providers and STML user's will not have a large influence on the project, and the SME Dr.Evangelista will be consulting the teams on their behalf.

The Professor – Primary Stakeholder

The professor needs all the students to conform to the requirements and deadlines established in the SWEN 670 course Syllabus. The professor also needs the course to conclude before April 6th in order to fit within UMGC's online course/semester schedules.

The professor is interested in the team developing a cogent and usable app that STM caregivers and STML users can use to improve their efficiency and hopefully quality of life. The professor is also interested in conveying the maximum amount of education to this capstone cohort that is possible. The professor influences the potential success of this project by grading / direct assessment of the deliverables outlined in the

4.10 Deliverables section of this Plan.

The Mentors - Stakeholder

The mentors are volunteering their time on this project. This group of stakeholders needs to conform to a set of interference rules established in the kickoff e-mail that explain that mentors “do not 1) provide content for project documentation, 2) decide/approve system design architecture, 3) perform code reviews *, 4) perform software Customer Acceptance Testing, and 5) schedule team (student) meetings with clients/customers or the professor” (Gordon, 2021).

The mentors are also interested in conveying the maximum amount of education to this capstone cohort as is possible. The mentors may also potentially be interested in maintaining networking opportunities that this project presents and/or gaining knowledge in the Software Development Process by guiding those with less experience. The mentors influence the likelihood of project success with their feedback on the deliverables in the

4.10 Deliverables section of this Plan.

Dr.Evangelista – Subject Matter Expert, Stakeholder

Dr.Evangelista is volunteering her time on this project as a subject matter expert in the health care field. Dr.Evangelista needs to conform to the same set of interference rules as the mentors described above.

Dr.Evangelista is interested in potentially gaining access to a software tool designed to improve the quality of life for individuals with STM challenges and the primary care providers of those individuals. Dr.Evangelista may also be interested in supporting the

educational development aspects of this program. This stakeholder/SME's influences project success based on their feedback on some of the deliverables in the

4.10 Deliverables section of this Plan.

Students/Management

Across all three teams, the students need to pass this capstone course in order to earn their master's degree in IT – Software Engineering from UMGC. The students also need to conform to the requirements and deadlines established by the professor in the SWEN 670 course syllabus. This group of stakeholders also need to abide by communication protocols and preferences dictated by the mentors and the professor. The details of this communication will be presented in the Communication section of this Plan.

This group of stakeholders has a diverse set of interests. Some within this group are interested in the final grade of the course, while others may be interested in the resume opportunities this project can provide. Some students may be interested in learning a new framework, while others may be interested in applying a known skill to the problem. The students within the teams and the team management affect the success of the project by their attitudes throughout the project and their grades on the items from the

4.10 Deliverables section of this plan.

The PM and Co-PM of RememberAll will keep these stakeholders in mind and meet their needs through attention and management of stakeholder engagement. RememberAll's members and management will work to practice appropriate stakeholder engagement throughout the life of the project and adjust communication plans/strategies as the need arises.

4.2 Communication

The communication in this course will be relatively simple without a formal communications standard to abide by. This decision was reach by examining the proximity of the stakeholders to one another from an organizational view. All of the stakeholders, with the possible exception of Dr.Evangelista are within the same organization, *United Global Master Coders*. This proximity supports the use of flexible ad-hoc communications, over a more rigid alternative. The following subsections present the four main communication channels RememberAll will be utilizing to communicate with the project stakeholders.

4.2.1 Microsoft Teams

Microsoft Teams will be utilized as the primary source of communication for this project. This means that most of the coordination and communication should take place in the Teams environment.

Video Conferencing

The video conferencing feature of Microsoft Teams will be utilized to host team/organizational meetings. These meetings may be held in the any of the tabs described below. Meetings may also be scheduled in advance (and recorded), but this functionality requires coordination with the Mentor Rob Wilson. Recorded meetings will support retention of key information and lower the notetaking burden on team members.

“RememberAll” Teams Tab

Table 3: Communication Types and Uses

Posts	<ul style="list-style-type: none"> • Pinned Posts Require Action or Acknowledgement by most of the team before un-pinning. • Posts starting with “UPDATE:” stand to inform the team of new information distributed from the SME/Professor/Mentors. • Emoji reactions stand to inform the poster or commenter that you have read or understood the message/post content. • Posts either contain all the information needed to understand it, or it links to the required information.
Files	<ul style="list-style-type: none"> • Primary storage location for RememberAll project files. • Milestone Deliverables shall be separated into unique folders to facilitate download/zipping and submission. • Storage area for reference material collected during research.
Wiki	<ul style="list-style-type: none"> • Presents Due Dates – Maintained as current by PM • Stores team, mentor, SME, and Sponsor Contact Info • Stores resources that require repeated referencing
RememberAll Team Chat	<ul style="list-style-type: none"> • Used for rapid fire discussion /quick organization about a topic.

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4.2.2 E-Mail

E-mail will be used as a means of communicating with some of the stakeholders since it is their preferred method of communication. Some e-mail communication should be directed through the overall project manager to reduce confusion and inbox clutter of some stakeholders. Please see the Stakeholder Identification, Management and Engagement section above. While Teams is intended as a primary source of communications for the team, it is acceptable to reach out via e-mail when trying to establish contact with a team member.

4.2.3 GitHub

GitHub offers a few key communication features that will be utilized by the project. GitHub offers a free issue tracking feature that will be useful for the developers to coordinate work as it arises whether expected or unexpected. Git hub also has the commit and merge notes that will be used to inform the team of development work as it is completed throughout the 12 weeks.

4.2.4 Phone Calls

Phone calls will be an acceptable means of emergency communication so long as both parties have agreed to the call or both have shared their phone number in the RememberAll wiki – Contact Info section. Examples of emergency call could be reaching out to remind about meeting or if access to a file or system is blocked by another user. If a phone call is made but not answered, the caller will attempt to leave a voicemail requesting a call back and providing a quick synopsis of the situation at hand.

4.3 Change Control

The change control will be implemented to minimize the impact of scope creep, communication of any change will be key. The SDLC in some form or fashion will experience change, how that change is handle will either negatively or positively impact deliverables.

Once the project plan and any design documents have been created and finalized, any changes will need to undergo a change request process via the form in Section 0. This process will include the change request form that will be filled out by any of the teams, internal stakeholders, external stakeholder, and a clear description of their recommended change. The change will be announced via communication channels currently being utilize (most likely Teams).

The request form will need to be reviewed collectively by the team, then the PM's will make the final say based on their evaluation of the project and its stage. The same process will be applied to changes from other teams, internal stakeholder, and external stakeholder. As change occur not every change is beneficial to the overall project and will be declined with plausible reasons to support the rejection.

4.4 Explanation of the Methodology

This project offers a unique set of challenges relating to the chosen software development methodology chosen to carry it out. A few RememberAll team members were familiar with the scrum process, and some had even recently taken courses on how to work within a scrum project. The face-to-face requirements/coordinated pose a challenge to the team since each team member may be balancing a full-time job, other coursework, and their own personal responsibilities that may or may not be disclosed to Project Management.

For the reasons stated above, it was determined that an asynchronous methodology would be the best way to get high level development out of our team with the least amount of disruption to their other commitments. The methodology we intend to implement will be iterative software development and adapted from Scrum to fit the asynchronous requirements of the team. Figure 4 presents a generic Scrum workflow, with several bottlenecks where there is work stoppage and team syncing. These main bottle necks are the sprint planning meeting, the Daily Scrum, the Sprint Review, and the Sprint Retrospective.

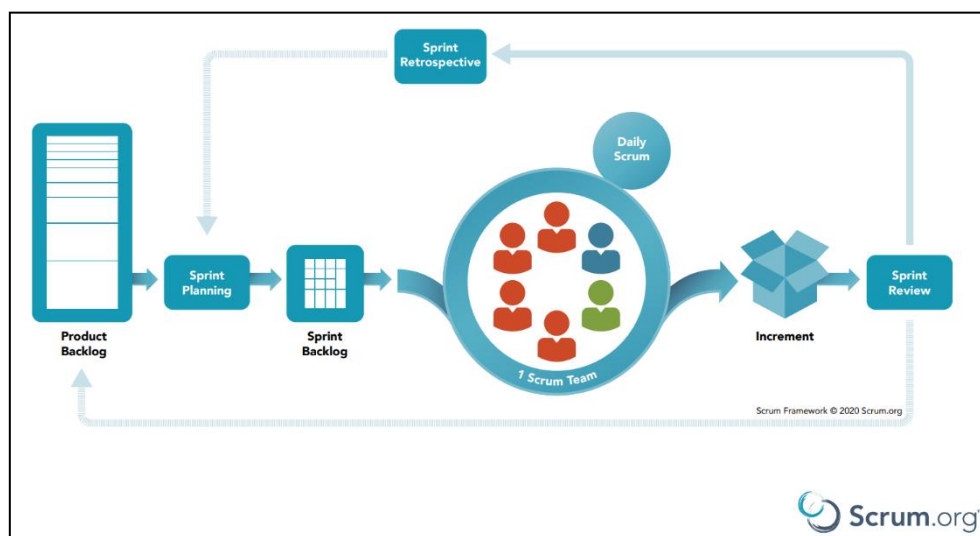


Figure 4: Standard Scrum development workflow Image Credit (Scrum.Org, 2022)

In order to break this methodology out of the strict synchronous reporting, RememberAll will be utilizing Microsoft Teams and GitHub. Figure 5 depicts RememberAll's adaptation of the Scrum workflow to attempt to eliminate the bottlenecks imposed by sitting the team down for meeting. The first adjustment was to remove the sprint backlog since the project development time is so short and the functionality being implemented is relatively

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narrow. After an analysis of the team's availability and work schedules, there will be about 1 Sprint per week, with a "Daily Post" due on Monday and Friday Night.

From there, the "Daily Scrum" is replaced with a "Daily Post" on Microsoft Teams, where the developers shall communicate: What they have done since the last post, what they expect to do by the next post, and any barriers they currently have. After that, the Sprint Review has been replaced with a Branch Review, and will take place via a Microsoft Teams post where the developers/testers will present their findings for that merge request. Lastly, instead of a sprint retrospective, there will be a Merge Retrospective post outlining the lessons learned during development of that merge.

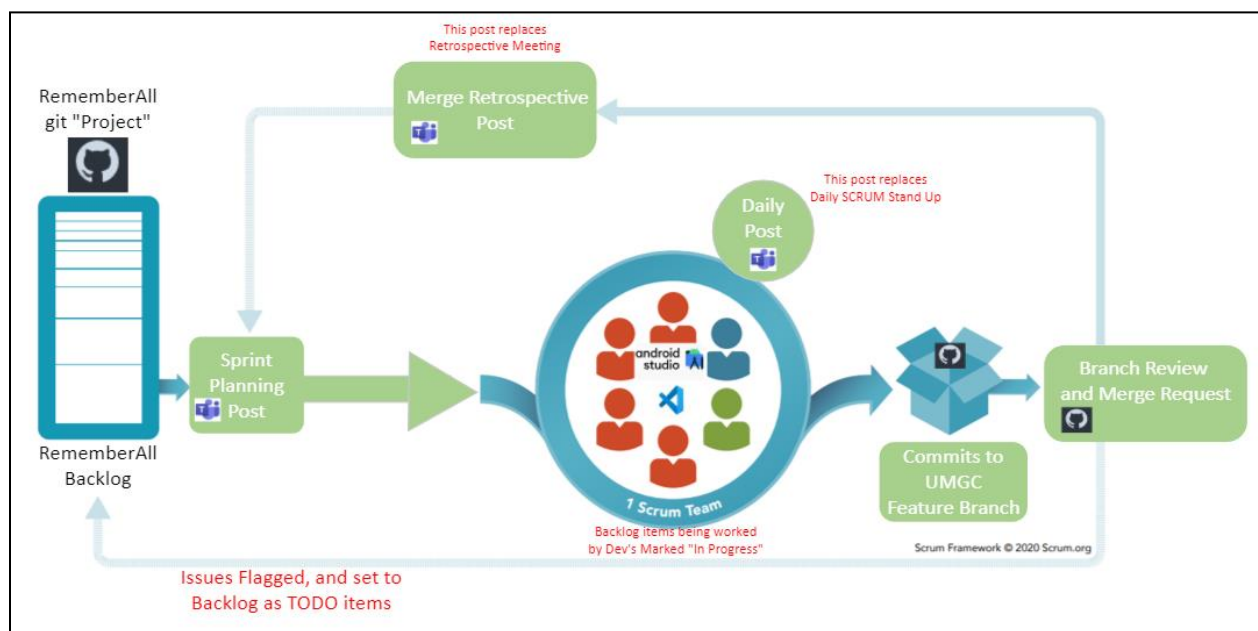


Figure 5: Asynchronous Adaptation of Scrum development workflow pre adjusted image Credit (Scrum.Org, 2022)

Lastly, the backlog will be managed using Atlassian's product -Trello. The backlog / Kanban board for MemorEZ is available here: <https://trello.com/b/8QXwf7N9/memorez-sprint-board>. Figure 6 Shows an image of the proposed RememberAll Trello Backlog workflow.

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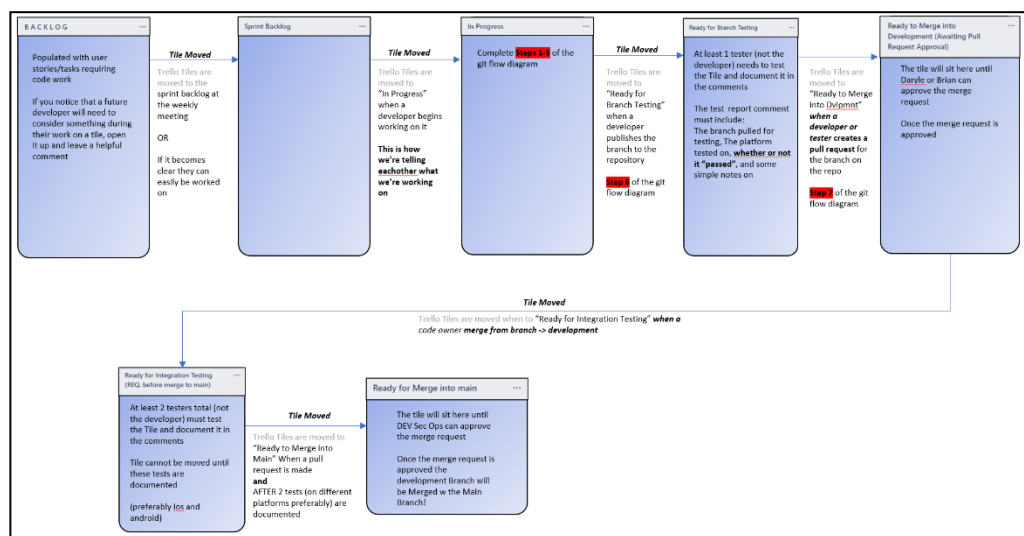


Figure 6: Image of Trello Backlog management proposal

Trello allows both development teams to communicate with each other quickly, effectively and asynchronously. This Trello board is publicly viewable and will be left behind for the benefit of future UMGC Cohorts.

4.5 Project Staffing

Due to the time and personnel constraints, the staffing for this project has been focused on communicating that the team members will wear multiple hats. Since the project kickoff, team members were split into two general groups: Developers and Business analysts. From there, a Co-PM position was established and filled by Genet. This Co-PM position was suggested early on by the project mentors to promote the overall health of the team.

Another key staffing decision made by RememberAll was to elect an individual to be focused on aspects of the application that require coordination between our developers and Fluttering Minds. A separate chat was established to foster these discussions and has already been helpful in clarifying which team will handle which requirements. This team will likely grow as the development becomes more complex.

4.6 Roles and responsibilities

Table 4 presents the roles and responsibilities for the members of RememberAll. The key responsibilities of the stakeholders outside of the RememberAll team are described in Section 0 of this project plan. It's important to note that all members will have multiple roles.

Table 4: Team members Roles and Responsibilities

Role	Member(s)	Responsibilities
Project Manager Co-Project Manager	Brian Avadikian Genet Asmelash	The PM and Co-PM are responsible for coordinating the efforts of the team in completing the tasks described in the Deliverables section of this plan.
UI Lead	Robert Edwards	The UI lead will coordinate the efforts of interested RememberAll developers in the creation of any required user Interfaces.
Developer Lead Interface Analyst	Johnnie Webb	The lead interface analyst is responsible for coordinating the efforts of the team in areas where development must be closely planned between RememberAll and any other group or system.
Lead Developer	Yusufu Sanu	The lead developer will coordinate the efforts of the Developers and communicate challenges to the PM's and relevant mentors as they arise.
Developer	Lizset Chacaltana Johnnie Webb Vivek Singh Robert Edwards	The developers will be responsible for writing code within the workflow established by DevSecOps. Developers will also communicate openly with the Lead Developer to convey any significant challenges or setbacks during their work.
Tester	Eyob Woldehana Genet Asmelash Robert Edwards Johnnie Webb	The testers will be responsible with ensuring that any functionality to be committed to the development branch is free from bugs / errors.

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Role	Member(s)	Responsibilities
Business Analyst	Eyob Woldehana Genet Asmelash Brian Avadikian	<p>The business analysts will focus on clearing the way for the Developers to complete their work, and facilitate their efforts by connecting the to mentors, resources, or the other team.</p> <p>The business analysts will also maintain the integrity of the team through the documentation on Microsoft Teams.</p>

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4.7 Responsibility Assigned Matrix

Figure 7 Displays the RACI matrix for RememberAll's major deliverables. This matrix was formatted to remain consistent with work from the previous cohort's project plan (Avery Et al, 2021) and adjusted by the RememberALL PM to represent the responsibility our team members and our division of work.

RememberAll Team RACI Matrix	Project Team											
	Robert Edwards (Developer)	Johnnie Webb (Developer)	Liise Chacaltana (Lead Developer)	Gineer Asmerilash (Co-Project Manager)	Brian Awadkhun (Project Manager)	James Elbie (Overall Project Manager)	Dr. Mir Asadulla (Product Owner)	Daniel Avey (Advisor/Stakeholder)	Boj Gordon (Advisor/Stakeholder)	Robert Wilson (Advisor/Stakeholder)	Eyob Woldemariam (Tester)	Vivek Singh (Tester)
Deliverable	Organization Leadership											
Milestone 1												
Project Plan	C	C	C	C	I	A	A	R	R	R	R	R
Software Requirements Specification	C	C	C	C	I	A	A	R	R	R	R	R
Project Team Meetings	I	I	I	I	I	R	R	R	R	R	R	R
SME Meetings	I	I	I	I	I	R	R	R	R	R	R	R
Peer / Individual Evaluations	I	I	I	I	I	R	R	R	R	R	R	R
Presentation	I	I	I	I	I	C	A	A	R	R	R	R
Milestone 2												
Technical Design Document	C	C	C	C	I	A	A	R	R	R	R	R
Project Plan Revision	C	C	C	C	I	A	A	R	R	R	R	R
Project Team Meetings	I	I	I	I	I	R	R	R	R	R	R	R
SME Meetings	I	I	I	I	I	R	R	R	R	R	R	R
Peer / Individual Evaluations	I	I	I	I	I	R	R	R	R	R	R	R
Milestone 3												
Programmer Guide	C	C	C	C	I	A	A	R	R	R	R	R
Deployment and Operations Guide	C	C	C	C	I	A	A	R	R	R	R	R
Project Plan Revision	C	C	C	C	I	A	A	R	R	R	R	R
Project Team Meetings	I	I	I	I	I	R	R	R	R	R	R	R
SME Meetings	I	I	I	I	I	R	R	R	R	R	R	R
Peer / Individual Evaluations	I	I	I	I	I	R	R	R	R	R	R	R
Milestone 4												
Software User Guide	C	C	C	C	I	A	A	R	R	R	R	R
Software Test Report	C	C	C	C	I	A	A	R	R	R	R	R
Presentation	C	C	C	C	I	A	A	R	R	R	R	R
Project Plan Revision	C	C	C	C	I	A	A	R	R	R	R	R
Project Team Meetings	I	I	I	I	I	R	R	R	R	R	R	R
SME Meetings	I	I	I	I	I	R	R	R	R	R	R	R
Peer / Individual Evaluations	I	I	I	I	I	R	R	R	R	R	R	R

Figure 7: RACI matrix for RememberAll

4.8 Project Tools

The table below details the tools used to complete this project. While several unique tools were added to this list that are specific to RememberAll, many of the tools and their description in Table 5 were included from the previous cohort of students working on a similar project in the Fall of 2021 (Avery et al., 2021).

Table 5: Tools used by RememberAll during the Project, NOTE: Some items pulled directly from Memory Magic Project Plan

Tool	Description
Android Studio	An integrated development environment (IDE) built for the development of applications for Android devices.
App Store	An Apple mobile application store for iOS operating systems.
Dart	A programming language used to develop the application at an accelerated pace. Dart is like other languages like Java and C# which will be an easy adjustment for the developers.
Flutter	An open-source UI software development kit developed by Google used to build iOS and Android applications. Flutter uses Dart as its language for cross-platform development.
GitHub	A repository hosting service that allows the Team to organize, share and edit the code for the project from anywhere. This environment will also be used to conduct issue tracking and manage the development backlog.
Google Play Store	A Google mobile application store for Android devices.
Microsoft Project	Microsoft project is a tool for project scheduling and personnel management / planning.
Microsoft Teams	A workplace integration platform developed by Microsoft that allows the Team to communicate through chat, videoconferencing, and file sharing.
Microsoft Word	A word processor created by Microsoft will allow the project team to prepare documentation to be shared to create a proper plan for each phase of the project.
Microsoft Visio	Microsoft Visio is used to quickly generate diagrams, charts and other visual communications.

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4.9 Project Storage

This project will be stored using a GitHub repository located at the following URL <https://github.com/umgc/Spring2022>. Please see the Explanation of Methodology section of this plan for a more detailed explanation on how code will be moved around and modified within this repository. Also, any project files associated with the deliverables will be contained in the Microsoft Teams RemeberAll environment, under the Files tab. Please see the Communication section of this plan for a more detailed explanation of the project information stored in Teams, please see the Communication section of this plan.

4.10 Deliverables

Milestone 1 - **Due 1/22 11 AM EST**

- Submission of **Project Plan**
 - Review + Compile relevant Project-Plan Documentation from previous teams
 - <https://umgc-cappms.azurewebsites.net/previousprojects>
 - Establish Project Scope
 - Compile/cite previous coursework regarding requirements gathering. Ensure appropriate elements of PMBOK are present in the Project Plan.
- Map Team and Client Meetings
 - Team Meetings Tentatively Tuesdays 7:30 PM EST
 - Project Management Meetings - Mondays 7:00 PM EST
- Submission of **Software Requirements Specification (SRS)**
 - Review + Compile relevant SRS Documentation from previous teams
 - The SRS should have all the elements that you studied in SWEN 645.
- **Team A Presentation - 25 min PowerPoint**

Earned Value Management Metric Reporting - **Recurring Weekly, Begins 1/21 11 AM EST**

- EVM metric reporting should commence at the conclusion of Week 2.
- Team shall take note of their hours worked on the project throughout the week and add them to the "Hours Pg." of the excel document to support the PM in creating this document.
- Each team PM produces a report that is sent to the overall PM for consolidation and forward to the professor, copy to Roy Gordon and Rob Wilson

Peer Assessment - **Due 1/26**

- https://docs.google.com/forms/d/1JZ81vZ9CrkUkvUjl1CTtX8hs9vldINzCwvbBqdGEow8/viewform?edit_requested=true
- Course evaluations are due by the following Wednesday after the milestone due date

Milestone 2 - **Due 1/29 11 AM EST**

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- Any deliverables for this defined/promised in the Project Plan for milestone 2
- **Technical Design Document**
- Add **Software Test Plan** to the Project Plan
 - Iterate the revision of the document

Peer Assessment - Due 2/2

- https://docs.google.com/forms/d/1JZ81vZ9CrkUkvUjl1CTtX8hs9vldINzCwvbBqdGEow8/viewform?edit_requested=true
- Course evaluations are due by the following Wednesday after the milestone due date

Milestone 3 - Due 3/19 11 AM EST

- Any deliverables for this defined/promised in the Project Plan for milestone 3
- **Programmer Guide**
 - As you develop the software, you should also prepare a Programmer Guide to guide future programmers working on the software that you developed. The Runbook should guide deployment of your software.
 - Representation of the critical thinking made by the programming team throughout the project
- **Deployment and Operations Guide**

Peer Assessment - Due 3/23

- https://docs.google.com/forms/d/1JZ81vZ9CrkUkvUjl1CTtX8hs9vldINzCwvbBqdGEow8/viewform?edit_requested=true
- Course evaluations are due by the following Wednesday after the milestone due date

Milestone 4 - Due 4/2 11 AM EST

- Any deliverables for this defined/promised in the Project Plan for milestone 3
- **Software User Guide**
- **Test Report**
- **Presentation**
 - Each team must make a presentation to the faculty member after Milestone 4.

Peer Assessment - Due 4/6

- https://docs.google.com/forms/d/1JZ81vZ9CrkUkvUjl1CTtX8hs9vldINzCwvbBqdGEow8/viewform?edit_requested=true
- Course evaluations are due by the following Wednesday after the milestone due date

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4.11 Project Schedule/WBS

The project schedule was derived using the SWEN 670 Syllabus, and correspondence between the professor and the overall project manager James Eble. Figure 8 presents the overall reporting schedule for RememberAll's communications up to management. Each of the items under "Task Name" in Figure 8 is described in the Deliverables section of this plan.

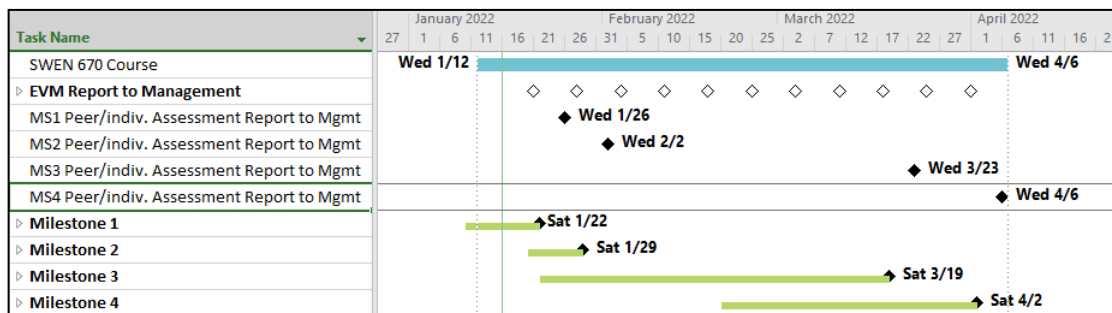


Figure 8: Submission Schedule for Reporting Requirements and Milestones

Each of the milestones 1 through 4 also contains several tasks and documents that need to be submitted by the end date listed in Figure 8. Figure 9 presents the complete list of deliverables associated with the various milestones. The Due Dates are shown on the right-hand side of the diamond shaped milestone symbols, while the suggested start dates are displayed to the left of each task. It is important to note that milestone 3 contains the largest span of time and will take place during actual code development, so future revisions of this plan may include more subtasks to account for the team's time during that time period.

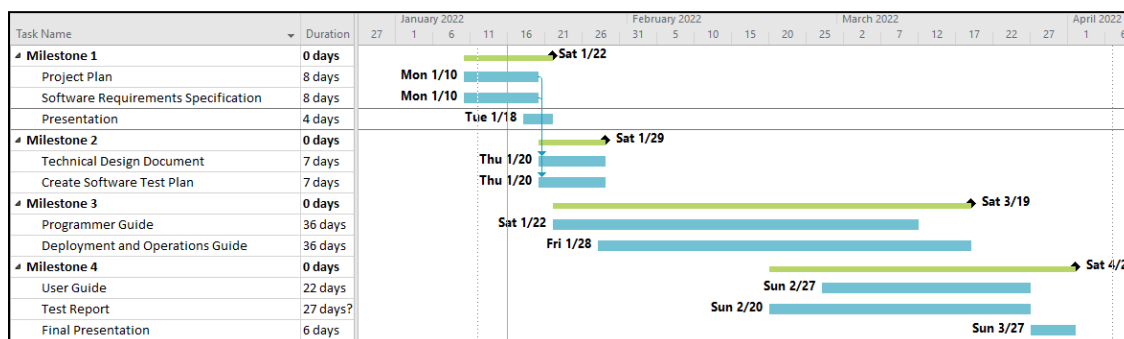


Figure 9: Sub-Tasks Required for each Milestone 1 through 4

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The work breakdown structure for the overall class and the four milestones is presented in Figure 10: Work Breakdown Structure for RememberAll / Fluttering Mind. Viewing the work in this way highlights the substantial amount of development and documentation work that will take place throughout the semester.

This breakdown includes 11 separated work initiatives. WBS items 1 and 2 are documentation focused and contain a cumulative 13 sub tasks, while WBS items 3 through 11 are development focused and all include an array of subtasks including: learning flutter/dart, reverse engineering previous UMGC Cohorts work, repairing previous UMGC Cohorts work, development of new functionality, and testing of new functionality.

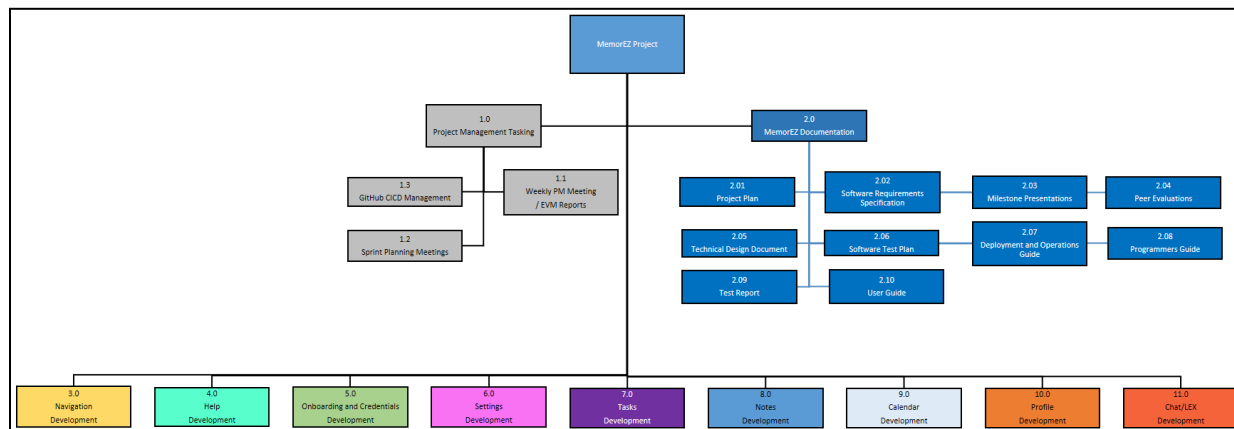


Figure 10: Work Breakdown Structure for RememberAll / Fluttering Mind

5 Software Test Plan

Software testing is the process of verifying and validating the functionality of software. Verification refers to ensuring that the product is being created in accordance with the software requirements specification. Whereas validation refers to determining how well the product completes the intended tasks.

5.1 Purpose

The purpose of this software test plan is to establish a framework that outlines how testing will take place during development of the MemorEZ application by Team RememberAll.

5.2 Testing Scope

Features that will be tested:

- The application works on Android and iOS devices.
- The application works on iOS versions 15.1 and 15.2.
- The application works on Android versions 11.0 and 10.0.
- The application has two distinct modes: Caregiver and User.
- The application starts in User Mode by default.
- In caregiver mode, a user profile can be viewed, edited, and stored containing the STML user's: Name, Address, Phone Number, Insurance information, Emergency Contacts, Medical issues, Means of transportation
- In caregiver mode, a user can view, edit, and add reminders.
- In caregiver mode, a user can view, edit, and add appointments.
- Reminders are displayed in the calendar.
- Reminders can be configured to recur as specified

Features out of the testing scope for Team RememberAll:

- iOS and Android versions that the application does not work on.
- Performance is not a concern for this project.
- Default user mode functionality will be tested by Team A (FlutteringMind)
 - These features will be a part of smoke tests

5.3 Approach

This section will summarize the collective testing strategy, including the types of testing that will be used, how they will be used, and why they were chosen.

5.3.1 Strategy

It is generally beneficial for the entire development team to participate in the testing process in Agile projects. In this project, all of Team RememberAll will be involved in creating and sharing test cases among the team to improve each member's understanding of all aspects of the product. This will be especially helpful in this project because most team members are filling multiple roles throughout the development process, which require different levels of knowledge.

5.3.2 Types of Testing Used

Unit testing – testing sections of code independently before integration.

Due to time constraints and limited resources, developers will conduct unit tests during development. Testing sections of code in isolation makes it easier to find bugs and easier find the cause of bugs if they are found. Conversely, testing after integration brings questions of whether the issue is caused by the unit, by the main codebase, or by an interaction between the two. Unit testing avoids those questions.

Smoke testing – testing the basic functionality of the existing software after something is integrated/added.

-NOTE-

Smoke testing is being proposed here due to the speed at which it can be conducted and documented.

While regression testing is clearly more thorough, RememberAll is concerned that there will not be enough resources to complete/conduct a regression test for each feature developed.

-NOTE-

Smoke testing will be completed whenever something new is being added to the main codebase. Commits will not be added to the main branch unless it is verified that the set of tests have been completed. RememberAll and Fluttering Mind will have a coordinated set of use cases tests designed in collaboration with the overall project manager. These use cases will be tested and recorded according to the acceptance testing requirements described below.

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The set of tests will be created by finding the most critical tasks performed in the app and developing simple tests that show each of those tasks can still be completed. The set of tests will be updated once new features are added to the application. Critical features and functionalities that are added early in development will be part of smoke tests for features added later.

The set of tests will be run frequently, so it is important for the tests to require little time and effort, while covering the most important parts of the application. Flutter Dart has the ability to develop and execute these tests through the use of flutter “Cookbook” tests (Flutter, 2022)

Acceptance testing – testing whether the product complies with requirements and meets the needs of the end-users.

Acceptance testing for the application must validate that each feature of the application’s UI fulfills its purpose. Each screen of the UI warrants a test suite comprised of test cases. Each test case should correspond to a screen feature. Each test case includes: *A Test Case ID Number for identification, the feature being tested, a test process description, an expected result, any assumptions, an actual result, an indication of pass or fail.*

Acceptance tests will be conducted at the end of each sprint. With limited external resources, the team members may volunteer to be an acceptance test subject.

System testing – the overall testing of an assembled product.

System testing is the formal testing stage to ensure the app works as expected and handles interactions in an acceptable manner. This step of testing will be conducted at the end of the main development phase.

5.3.3 Test Verification

To verify that tests are being run, tests will require an independent party to be present for the tests to be accepted. An independent party will be a second team member. Testers will be required to screenshare in Microsoft Teams to allow a second member to sign off on the completed tests. Each test will be required to state the member running the tests and the member that is verifying that the tests are run.

5.4 Environment

The MemorEZ application will be developed and tested in the Android Studio IDE, version Arctic Fox 2020.3.1. Tests will be conducted using the two most common Android and iOS versions.

From January 2021 to January 2022, the most common Android versions were Android 11.0 at 38% and Android 10.0 at 26% (StatCounter 2022). Android 11.0 correlates to Android API level 30 and Android 10.0 correlates to API level 29 in the emulation software.

During the same period, the most common iOS versions were iOS 15.1 at 35% and iOS 15.2 at 21% (StatCounter 2022). Therefore, testing will be conducted on Android versions 11.0 and 10.0, and iOS versions 15.1 and 15.2. The two most common versions of Android and iOS are the two most recently released versions for each platform, which provides the added benefit of maximizing the lifespan of an application created for those OS versions. This information is shown graphically in the following Figures.

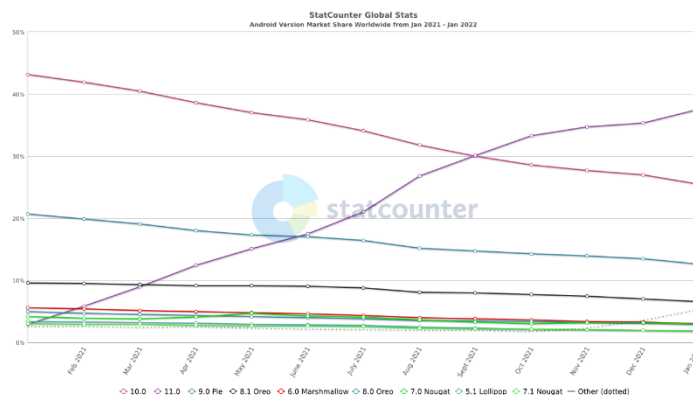


Figure 11: Android version Global Statistics (StatCounter 2022)

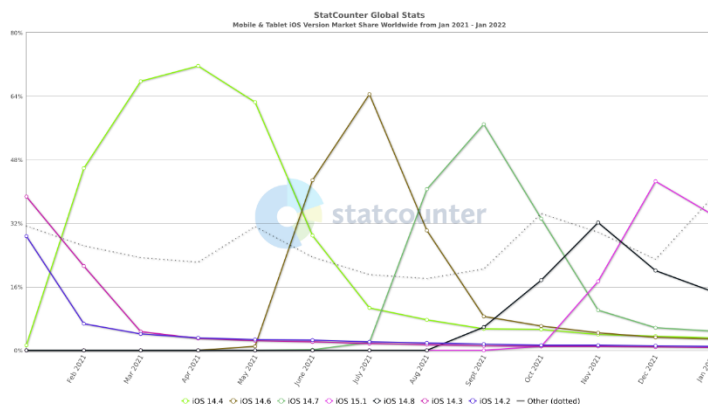


Figure 12: iOS Version Global Statistics (StatCounter 2022)

5.5 Roles and Responsibilities

Table 6:RememberAll Testing Responsibilities

Role	Responsibilities	Name
Project Manager	<ul style="list-style-type: none"> Organizing tasks Deciding when to address which defects Determining when suspension and resumption criteria are met Ensuring that testing processes are followed in accordance with the test plan 	Brian Avadikian
Developer	<ul style="list-style-type: none"> Creating and running unit tests during development Verifying that tests are run by other team members 	Yusufu Sanu
		Vivek Singh
		Lizset Chavez
Developer/Tester	<ul style="list-style-type: none"> Creating and running unit tests during development Verifying tests that are run by other team members Creating and running smoke tests and system tests 	Jhonnie Webb
		Genet Asmelash
		Robert Edwards
Tester	<ul style="list-style-type: none"> Helping developers create unit tests during development Verifying that tests are run by other team members Creating and running smoke tests and system tests 	Eyob Woldehana

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5.6 Schedule

Feature testing should start by week 6 (February 13), and continue through development. Final usability testing should be in week 11 (March 20) and end by March 26. Final test report is due for Milestone 4 on April 2.

Table 7: Schedule for Sprint Testing

Test Type	Start Date	End Date
Sprint Feature Testing	February 13	February 19
Sprint Feature Testing	February 20	February 26
Sprint Feature Testing	February 27	March 5
Sprint Feature Testing	March 6	March 12
Final Acceptance Testing	March 20	March 26

5.7 Defect Management

This section will explain how bugs/defects will be reported and addressed by Team RememberAll throughout this project.

5.7.1 Trello "Problems" Column

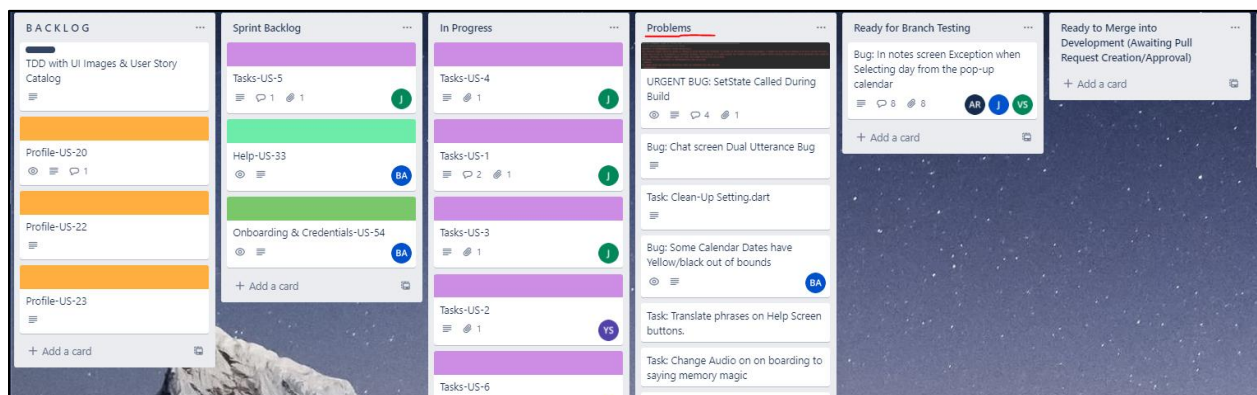


Figure 13: GitHub's new "Project" feature with automatically updating project boards

Since the main development workflow will be focused on the asynchronous use of Trello, we have decided to create a dedicated column where tiles that caused or represented

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defects would be stored. This column is in addition to the other more standard columns required .

5.7.2 Severity Classification

Issues will be reviewed and organized by level of importance in the GitHub Backlog. The Backlog will be reviewed daily by RememberAll's PM and Lead Developer to make decisions about categorizing and prioritizing issues. The issues will be according to the following table.

Table 8: Severity Table (SoftwareTestingHelp, 2022)

Severity	Definition
(S1) - Critical	A defect prevents testing or causes the application to become unstable. / Crashing
(S2) - Major	A feature does not meet requirements and impacts the overall functionality of the application.
(S3) - Moderate	A feature does not meet requirements but does not have a major impact on the application.
(S4) - Minor	Cosmetic issues with no functional impact.

5.7.3 Risk

Potential risks should be listed before a test group is tested. Some risks that can relate to testing are:

- Increased Scope
- Not enough time to test
- Not enough testers

Additional risks for specific test groups should be listed before initializing their tests. When risks occur after the fact, one source states that there are four risk mitigation options (The Saylor Foundation, n.d., p.354):

- Risk avoidance: find an alternative strategy that may cost more time
- Risk sharing: getting assistance from another entity
- Risk reduction: investing more time to reduce risk
- Risk transfer: shifting risk to another entity (future UMGC cohort)

5.8 Suspension and Resumption Criteria

Suspension/Resumption criteria are referring to situations in which the process of testing a feature is halted and re-started respectively. RememberAll has identified the following 8 criteria that would interrupt the cadence of testing.

Table 9: Suspension and Resumption Criteria

Suspension Criteria	Resumption Criteria
An issue is found in code that is implemented in many locations throughout the application	The issue is fixed, and the fix is implemented throughout the application. Unit tests are completed in each section that had been modified.
An issue of severity S1 is discovered	The issue is no longer reproducible and smoke tests are completed without new issues arising.
There are changes to the requirements under test	New tests are created, matching the new requirements, and are approved by stakeholders.
The resources for testing are not available	Testing will take place with available resources, prioritizing tests regarding issues of higher severity (S1, S2, S3, and then S4).
iOS/Android hardware is not available for testing	In cases approved by the Lead Dev, testing on one platform will suffice
Previous tests were determined not to be satisfactory by the independent observer	The issue is escalated to the PM and guidelines are repeated to the tester involved.

5.9 Test Cases

The following test cases were developed by the overall project manager in an effort to standardize the cases for testing. We have 13 test cases presented below.

5.9.1 Test Case 1

Test ID Number	#
Feature Being Tested	6.1 Change User Mode to Caregiver Mode
Test Process	1. Open the app and switch to caregiver mode
Expected Result	The state of the app should switch to caregiver mode
Assumptions	
Actual Result	
Pass/Fail	

5.9.2 Test Case 2

Test ID Number	#
Feature Being Tested	6.2 View MemorEZ App Settings
Test Process	1. Put the app in caregiver mode 2. Move to settings section
Expected Result	The caregiver should be able to view settings
Assumptions	
Actual Result	
Pass/Fail	

5.9.3 Test Case 3

Test ID Number	#
Feature Being Tested	6.3 Edit MemorEZ app settings
Test Process	1. Place the application in caregiver mode 2. Navigate to the settings section 3. Change a setting 4. Exit the application 5. Open the application 6. Navigate to settings
Expected Result	The caregiver should see the changed setting
Assumptions	
Actual Result	
Pass/Fail	

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5.9.4 Test Case 4

Test ID Number	#
Feature Being Tested	6.4 View STML User Profile
Test Process	1. Place the application in caregiver mode 2. Navigate to the profile section
Expected Result	The user should be able to view the STML profile
Assumptions	
Actual Result	
Pass/Fail	

5.9.5 Test Case 5

Test ID Number	#
Feature Being Tested	6.5 Edit the STML user profile
Test Process	1. Place the application in caregiver mode 2. Navigate to the profile section 3. Edit the profile section 4. Close the app 5. Re-open the app in the app and navigate to the profile section
Expected Result	The user should be able to see their changes to the profile
Assumptions	
Actual Result	
Pass/Fail	

5.9.6 Test Case 6

Test ID Number	#
Feature Being Tested	6.6 View STML user calendar
Test Process	1. Place the application in caregiver mode 2. Navigate to the calendar section
Expected Result	The user should be able to view the calendar
Assumptions	
Actual Result	
Pass/Fail	

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5.9.7 Test Case 7

Test ID Number	#
Feature Being Tested	6.7 Edit STML User Calendar
Test Process	1. Place the application in caregiver mode 2. Navigate to the calendar section 3. Make an edit in the calendar 4. Close the app 5. Re-open the app and navigate to the calendar section
Expected Result	The user should be able to see their edit in the calendar
Assumptions	
Actual Result	
Pass/Fail	

5.9.8 Test Case 8

Test ID Number	#
Feature Being Tested	6.8 View STML user reminders
Test Process	1. Place the application in caregiver mode 2. Navigate to the reminder section
Expected Result	The user should be able to view automatic reminders for the STML patient
Assumptions	
Actual Result	
Pass/Fail	

5.9.9 Test Case 9

Test ID Number	#
Feature Being Tested	6.9 Add/Edit STML user reminders
Test Process	1. Place the application in caregiver mode 2. Navigate to the reminders section 3. Add a reminder and edit a reminder 4. Close the app 5. Re-open the app and navigate to caregiver mode 6. Navigate to the reminders section
Expected Result	The user should be able to see the reminder addition/edit
Assumptions	
Actual Result	
Pass/Fail	

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5.9.10 Test Case 10

Test ID Number	#
Feature Being Tested	6.10 View STML User Resources
Test Process	1. Place the application in caregiver mode 2. Navigate to the resources
Expected Result	The user should be able to see the STML user resources
Assumptions	
Actual Result	
Pass/Fail	

5.9.11 Test Case 11

Test ID Number	#
Feature Being Tested	6.11 Edit STML user resources
Test Process	1. Place the application in caregiver mode 2. Navigate to the resources section 3. Edit a resource 4. Close the app 5. Re-open the app and navigate to caregiver mode 6. Navigate to the resources section
Expected Result	The user should be able to see the resource edit
Assumptions	
Actual Result	
Pass/Fail	

5.9.12 Test Case 12

Test ID Number	#
Feature Being Tested	6.12 View Transportation Resources
Test Process	1. Place the application in caregiver mode 2. Navigate to the resources section
Expected Result	The user should be able to see the transportation resources
Assumptions	
Actual Result	
Pass/Fail	

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5.9.13 Test Case 13

Test ID Number	#
Feature Being Tested	6.13 Edit Transportation Resources
Test Process	1. Place the application in caregiver mode 2. Navigate to the resources section 3. Edit a transportation resource 4. Close the app 5. Re-open the app and navigate to caregiver mode 6. Navigate to the resources section
Expected Result	The user should be able to see the transportation resource edit
Assumptions	
Actual Result	
Pass/Fail	

5.10 Deliverables

Table 10: Testing Deliverables and Dates

Deliverable	Date
Test Plan	Due for Milestone 2 on 2/5/2022
Test Cases	Due after each Code Sprint – TBD/Weekly
Test Suites	Due after each Code Sprint – TBD/Weekly
Test Report	Due for Milestone 4 on 4/2/2022

6 Appendices

6.1 References

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6.2 Project Schedule/WBS

This section will be updated to include development related tasking for Milestone 3 in future revisions of the Project Plan.

6.3 Change Request Documentation

Change Request Form			
Project Name			
Requested By		Date	
Request No.		Name of Request	
Change Description			
Change Reason			
Impact of change			
Proposed Action			
Status	In Review	Approved	Rejected
Approval Date			
Approved by			

* Template from: <https://expertprogrammanagement.com/2017/06/change-request-template/>

Figure 11:Change Request Form

6.4 Acronyms and Abbreviations

Table 6: Acronyms and Definitions

Acronym	Definition
.com	Internet Domain
.dev	Internet Domain
.net	Internet Domain
.org	Internet Domain
AM	12-hour Time Convention
app	Application
co-pm	Co-Project Manager
Ctrl	Control
DevSecOps	Development Security Operations
Dr.	Doctor
DSO	Development Security Operations
E-mail	Electronic Mail
EST	Eastern Standard Time
et al	and others
etc	and so on
EVM	Earned Value Management
git	GitHub
hr	Hour
IDE	Integrated Development Environment
indiv	Individual
iOS	iPhone Operating System
IT	Information Technology
mgmt	Management
min	minute
MS	Microsoft
MS1	Milestone 1
MS2	Milestone 2
MS3	Milestone 3
MS4	Milestone 4
org	Organization
Pg	Page
PM	Program Manager / 12-hour Time Convention
PMBOK	Program Management Body of Knowledge
QA	Quality Assessment
RACI	Responsible, Accountable, Consulted, Informed
Sat	Saturday

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Acronym	Definition
SME	Subject Matter Expert
SRS	Software Requirements Specification
STM	Short Term Memory
STML	Short Term Memory Loss
SWEN	Software Engineering
TBD	To Be Determined
TDD	Technical Design Document
Thu	Thursday
TODO	To Do - as in a task to complete
Tue	Tuesday
UI	User Interface
URL	Uniform Resource Locator
UX	User Experience
UMGC	University of Maryland Global Campus/United Global Master Coders
WBS	Work Breakdown Structure
Wed	Wednesday
wiki	A page that allows collaborative editing