Short-Term Memory System (STeMS)
Project Plan
By AlphaSoft

Team Members

Awasthi, Aaditya

Blavat, Oleksiy

Bond, Matthew

Carter, Mackenzie

Mahbobi, Sayed shah

McAllister, Charlie

McCool, Max

McLaughlin, Taylor

Powers, Michael

Weaver, Daniel

Sign Offs

Milestone 1
Approved

_____ _____
David Babers Date

_____ _____
Dr. Mir Assadullah Date

Milestone 2
Approved

_____ _____
David Babers Date

_____ _____
Dr. Mir Assadullah Date

Milestone 3
Approved

_____ _____
David Babers Date

_____ _____
Dr. Mir Assadullah Date

Milestone 4
Approved

_____ _____
David Babers Date

_____ _____
Dr. Mir Assadullah Date

Revision History

Date	Version	Description	Author
20 May 2023	1.0	Initial submission to Client	AlphaSoft
17 June 2023	2.0	Updated Project Plan based on client feedback	AlphaSoft
22 July 2023	3.0	Updated to match current state of project.	AlphaSoft
5 August 2023	4.0	Updated to match current state of project.	AlphaSoft

Table of Contents

Figures & Tables

1. Introduction

There are many segments of the population of people who suffer from short-term memory loss. These forms of amnesia may be age-related dementia, psychological in nature, or due to any number of organic medical issues. A common thread is that these people have long-term memory, for example remembering childhood friends clearly, but no short-term memory, such as someone met yesterday or new family members.

Additionally, there are those who work in detail-oriented fields with a high demand on their short-term memory. They would appreciate assistance with recalling conversations mere moments after they happen. Waiters and servers are one such occupation that could benefit from this assistance.

ChatGPT is a plain language artificial intelligence that can take English conversation and glean points of information. The goal for the STeMS project is to build a mobile app which records the conversations, transcribes this to text, and can answer questions via ChatGPT to benefit the user.

1.1. Problem Definition

AlphaSoft has been selected to create a mobile app and browser extension. The organization includes sufficient resources to generate a project plan, a Software Requirements Specification (SRS), a Technical Design Document (TDD), a Software Test Plan (STP), a Programmer Guide (PG), a Deployment and Operations Guide (DOG), a User Guide (UG), and a Software Test Report (STR). In short, executing an entire project design and implementation process.

The STeMS project requires two teams: Team A will address the development of the front end of the software, and Team B will be responsible for the development of the back end. Hence, extensive cross-team communication will be necessary throughout the project. This communication will be coordinated by the various leads of the teams and the Project Manager.

STeMS will rely on third-party Application Programming Interfaces (APIs) to interact with ChatGPT. However, it is its own project and does not have a relationship to any existing project, mobile app, or software package currently in existence.

This project is not commercial in goal. The primary purpose is for the social good of assisting others in need.

The client for this project is Dr. Mir Assadullah.

1.1. Project Documents

This Project Plan document is part of a set of documents created to aid in developing the STeMS application and to provide artifacts with vital information for the application's ongoing support and operation throughout its full life cycle.

The following documentation will be included in the entire documentation package for this project.

Document	Version	Date
Project Plan (PP)	4.0	5 August 2023
Software Requirements Specification (SRS)	4.0	5 August 2023
Technical Design Document (TDD)	3.0	5 August 2023
Software Test Plan (STP)	3.0	5 August 2023
Programmer Guide (PG)	2.0	5 August 2023
Deployment and Operations Guide (DOG)	2.0	5 August 2023
Software Test Report (STR)	1.0	5 August 2023
User Guide (UG)	1.0	5 August 2023
Traceability Matrix (TM)	1.0	5 August 2023

Table 1: Project Documents

1.2. Acronyms, Definitions, and Abbreviations

Term	Definition
API	Application Programming Interface. The public facing side of a web service or computer system
Artifact	Any document, object, or thing that is created by the work of the team in completing the project
BESie	Back End Service. This is a web service that connects the browser extension to the mobile app.
Browser Extension	A small program that can be added to a browser to extend its functionality
CCB	Change Control Board. A group of people that decide what goes into a product and what does not
ChatGPT	An AI language model, designed to understand and generate human-like text
EULA	End User License Agreement, or the terms that the user must agree to in order to continue using the product.
MVP	Minimum Viable Product. This is the minimum amount that must be done before the product can be delivered to users.
OpenAI	An artificial intelligence research organization that develops advanced language models and other AI technologies
POC	Proof of Concept. Work that is done to provide assurance that something is possible and works as expected
PP	Project Plan. Our document that lays out the organization of the project along with many other meta-project concerns
Programmer Guide	A document the provides the reasons and rationale for why different decisions were made regarding the program
Deployment and Operations Guide	A document that explains how to deploy the program
Sprint	A time boxed set of tasks to be completed
STeMS	Short Term Memory System; this project's name.

Term	Definition
SRS	Software Requirements Specification. A document that states what the software needs to do
STP	Software Test Plan. A document outlining the verification and validation process for the product
STR	Software Test Report. A document that summarizes all testing activities and outcomes
TDD	Technical Design Document. A document that provides details of how the project will work technically
TM	Traceability Matrix. A document that traces defects and test cases back to their requirement.
Users' Guide	A document that explains to a user how to use the program
UI	User Interface. What the user sees when working within the program
UX	User Experience. How the user interacts with the program
Web Service	A computer that can receive and respond to inputs from the internet

Table 2: Acronyms, Definitions and Abbreviations

2. Organization of the Project

Due to the limited time and fluid nature of this project, an Agile methodology shall be used for project management. Sprints and Kanban boards will be incorporated to increase the effectiveness of the team. Agile is very good for adapting to feedback from stakeholders and adjusting to new information. Sprints keep the work to be done organized. Kanban boards are very good for tracking the work and will be incorporated through the free version of Trello, a web-based Kanban project management application. This mix of methodologies and tools will allow AlphaSoft to function at maximum productivity.

2.1. Project Phases

- The Initiation phase identifies the objectives and who will be involved in order to complete those objectives. It includes corollary information, like risks and scope.
- The Planning phase creates the feature list, processes, and support needed for achieving the objectives.
- The Execution phase is when the creation of the application is begun. This phase will be iterative and in parallel with the following Review and Adaptation phase.
- The Review & Adaptation phase processes stakeholder feedback and provides an avenue for adjustments to be made at periodic intervals.
- The Closure phase provides the final deliverables to the client and includes the team evaluation of their own performance for future improvement and lessons learned.

2.2. Milestones and Deliverables

2.2.1. Milestone 1: Due on 03 June 2023

- Development of a Project Plan (this document)
- Development of a Software Requirements Specification

2.2.2. Milestone 2: Due on 17 June 2023

- Development of a Technical Design Document
- Creation of a Software Test Plan
- Prototypes shall be developed in this period

2.2.3. Milestone 3: Due on 22 July 2023

- Development of a Programmer Guide
- Development of a Deployment and Operations Guide
- Refinement of the Software Test Plan

2.2.4. Milestone 4: Due on 05 August 2023

- The software program shall be completed and delivered to the client
- Development of a User Guide
- Development of an Software Test Report
- Refinement of the Programmer Guide

2.3. Roles and Responsibilities

2.3.1. Roles

The client, Dr. Mir Assadullah, has already completed a feasibility study, established objectives, provided funding, and approved the project. He has also set four milestones to be completed within 12 weeks (see Deliverables). Additionally, there will be a checkpoint meeting on 8 July 2023 to make sure that everything is on schedule and, if necessary, to make corrections.

AlphaSoft will be completing a risk management plan, a work breakdown structure, cost analysis, and budget. AlphaSoft will recruit qualified human resources as needed and manage them to efficiently complete the project on time and within budget.

The stakeholders in this project are Dr. Assadullah and AlphaSoft, including all members of its organization, both jointly and separately.

The following roles have been identified as necessary to the project.

- Client
  - Provides objectives, requirements, and feedback on the project
- Project Manager
  - Provides the Client with project updates and statuses
- Team Lead
  - Organizes and coordinates the entire team
  - Liaison between the team and the Client and Project Manage
  - Submits all documentation to the Client
- Product Owner
  - Responsible for organizing and prioritizing stories in advance
  - Works with Stakeholders and Project Manager
  - Organizes and assists the Business Analysts
- Business Analyst
  - Create use cases/stories
  - Convert stakeholder/client requests into business rules
  - Work with Leads to make sure all stories can be developed and tested
- Technical Writing Lead
  - Organizes the technical writers
  - Creates and enforces documentation and terminology standards
- Technical Writer
  - Proofreads all documentation
  - Reviews all documentation
  - Provides feedback on what others have written
  - Organizes others' writings to produce cohesive documentation
- UX Designer
  - Designs the user interfaces
  - Creates related documentation
- Architect
  - Designs the high-level structure of the project
  - Creates related documentation
- Software Development Lead
  - Organizes the software developers
  - Reviews all code for possible defects, maintainability, and organization
- Software Developer
  - Codes everything according to the use cases/stories, architecture designs, and UX design
  - Helps code review other Developers' work
- Testing Lead
  - Organizes the testers
  - Reviews all test plans and test cases for full code coverage, edge case handling, and coverage of all user scenarios
  - Create testing environments
- Tester
  - Test everything according to the STP, use cases, and stories
  - Create test plans and test cases
  - Review other testers’ work

2.3.2. Role Assignments

Therefore, based on the talents available, the following roles have been assigned. As the demands of the project dictate, team members might be reassigned from Team A to Team B or vice versa on a temporary or permanent basis.

Name	Roles
Dr. Mir Assadullah	Client
David Babers	Project Manager
Awasthi, Aaditya	Testing Lead
Blavat, Oleksiy	Architecture Software Development Lead
Bond, Matthew	Technical Writing Lead UX Designer
Carter, Mackenzie	Business Analyst Tester
Mahbobi, Sayed shah	Tester UX Design Lead
McAllister, Charlie	Software Developer
McCool, Max	Product Owner Technical Writer
McLaughlin, Taylor	Technical Writer Test Engineer
Powers, Michael	Team Lead Software Developer
Weaver, Daniel	Software Developer

Table 3: Role Assignments

2.3.3. Assignees by Role

Role	Assignees
Client	Dr. Mir Assadullah
Project Manager	David Babers
Team Lead	Michael Powers
Product Owner	Max McCool
Business Analyst	Mackenzie Carter Matthew Bond
Technical Writing Lead	Matthew Bond

Role	Assignees
Technical Writer	Max McCool Taylor McLaughlin Mackenzie Carter
UX Design Lead	Sayed shah Mahbobi
UX Design	Matthew Bond
Architect	Oleksiy Blavat
Software Development Lead	Oleksiy Blavat
Software Developer	Charlie McAllister Michael Powers Daniel Weaver
Testing Lead	Aaditya Awasthi
Tester	Mackenzie Carter Sayed shah Mahbobi Taylor McLaughlin

Table 4: Assignee by Role

2.3.4. RACI Matrix

A RACI Matrix identifies, for each task, the role's responsibility level. There are 4 level corresponding to the acronym's letters: Responsible, Accountable, Consulted, and Informed. Responsible means the person that has to do the task. If Accountable, then that person has ownership of the task and must make sure the task is completed satisfactorily. Consulted means they either provide assistance, advice, or are a subject matter expert. The Informed individuals do not participate in the work at all, but they do need to be kept up to date on the progress of the work.

Task	Role	Responsible	Accountable	Consulted	Informed
Project Plan	Client				X
	Project Manager				X
	Team Lead	X	X		X
	Technical Writing Lead	X		X	
	Technical Writers	X			
SRS	Client				X
	Project Manager				X
	Team Lead				X
	Technical Writers			X	
	Product Owner	X	X		
	Business Analyst	X			
TDD	Client				X

Task	Role	Responsible	Accountable	Consulted	Informed
	Project Manager				X
	Team Lead				X
	Technical Writing			X	
	Architect	X	X		
	Software Development Lead	X	X		
	Software Developer	X			
Software Test Plan	Client				X
	Project Manager				X
	Team Lead				X
	Technical Writing			X	
	Testing Lead	X	X		
	Tester	X			
Flutter/Dart	Team Lead				X
	Architect			X	
	Software Development Lead	X	X		
	Software Developer	X			
Recording Audio	Team Lead				X
	Architect			X	
	Software Development Lead	X	X		
	Software Developer	X			
Web Sockets	Team Lead				X
	Architect			X	
	Software Development Lead	X	X		
Browser Extensions	Team Lead				X
	Architect			X	
	Software Development Lead	X	X		
	Software Developer	X			
UX Design	Client				X
	Team Lead				X
	Architect			X	
	Software Development Lead			X	

Task	Role	Responsible	Accountable	Consulted	Informed
	Software Developer			X	
	UX Design Lead	X	X		
	UX Designer	X			
Backlog	Team Lead				X
	Software Development Lead			X	
	Software Developer			X	
	UX Design Lead			X	
	UX Designer			X	
	Product Owner	X	X		
	Business Analyst	X			
Stories	Team Lead				X
	Technical Writing			X	
	Product Owner	X	X		
	Business Analyst	X			
Mobile App Development (includes all sub elements)	Team Lead				X
	Architect			X	
	Software Development Lead	X	X		
	Software Developer	X			
	UX Design Lead			X	
	UX Designer			X	
Web Service Development	Team Lead				X
	Architect			X	
	Software Development Lead	X	X		
	Software Developer	X			
Browser Extension Development	Team Lead				X
	Architect			X	
	Software Development Lead	X	X		
	Software Developer	X			
Test Cases	Team Lead				X
	Testing Lead	X	X		
	Tester	X			
	Team Lead				X

Task	Role	Responsible	Accountable	Consulted	Informed
Product Testing	Testing Lead	X	X		
	Tester	X			
Software Test Report	Client				X
	Team Lead				X
	Testing Lead	X	X		
	Tester	X			
User Guide	Client				X
	Project Manager				X
	Team Lead	X	X		X
	Technical Writing Lead	X		X	
	Technical Writers	X			
Programmer Guide	Client				X
	Project Manager				X
	Team Lead				X
	Technical Writing Lead	X	X		
	Technical Writers	X			
	Software Development Lead			X	
	Software Developer			X	
Deployment and Operations Guide	Client				X
	Project Manager				X
	Team Lead				X
	Technical Writing Lead	X	X		
	Technical Writers	X			
	Software Development Lead			X	
	Software Developer			X	
Deliver Product	Client			X	X
	Project Manager			X	X
	Team Lead	X	X		

Table 5: RACI Matrix

3. Project Details

3.1. Conceptualization and Feasibility

Dr. Mir Assadullah is the originator of this project idea. He has already completed a feasibility study, set objectives, and provided funding. He has explained to AlphaSoft the three primary use cases that he would like the project to handle as part of an MVP (minimum viable product).

3.2. Scope

The scope of the project will include the development of a mobile app and a related browser extension. An MVP will be completed initially. At the conclusion of the project, all deliverables will be sent to the client for a final review and sign-off.

Further enhancements and changes to the program will be evaluated and handled in a future project. As part of the development of the software, the project will also include all documents used in the development process, i.e., TDD & STP. Additionally, documents will be generated that will assist others in the ongoing maintenance and use of the program.

There are some documents and artifacts that will be created during the process that will not be delivered to the client. This might include sprint stories, discussion transcripts, and other transient or unstructured documentation.

The project's scope will specifically not include providing security certifications for signing files; deployment to Google's Play Store, Apple's App Store, or any other similar service; and making the browser extension available publicly in Chrome's Web Store or any other similar service. Any suggested enhancements or changes to the program during this project will be handled by a Change Control Board (see below).

The project is divided between 2 teams, Team A and B. Team A will work on the front-end while Team B will work on the back-end. The front-end includes all things a user of the product can see as well as their interaction with the backend. The back-end will handle everything else, which includes, but is not limited to, hard-drive access, recording sound, calls to third-party services, and web services.

3.3. Risk analysis

As with all projects and endeavors, there are risks inherit in doing them. AlphaSoft has analyzed this project for various risks and how to mitigate them. The following types of risks were considered: External, Legal, Organizational, Personnel, Omission in Project Scope, and then their probably impact on the project outlined below.

3.3.1. External Risks

External risks are outside the control of the client and AlphaSoft. These could be as unlikely as a natural disaster disrupting internet service for a significate time to something much more likely as data loss from a broken computer. Since the AlphaSoft members are in globally diverse locations, an internet outage could prevent some or all members from communicating and coordinating with others.

The OpenAI group of services, which includes ChatGPT, are third party services that will be utilized to make STeMS work. Changes in their APIs could drastically change the functionality of STeMS, including potentially making it non-functional. Therefore, delays in this project could happen if the APIs change as extra development time will be needed to adjust the product to match.

3.3.2. Legal Risks

The legality of recording a conversation varies greatly from state to state, nation to nation. This software package will depend on recording conversations and mining data from such. An end user license agreement (EULA) will be written stating that it is incumbent on the owner of the app to alert people of the recordings. Future versions of the software can be refined so that it responds only to the owner's voice and may not record

the whole conversation. The specificity of how to handle this risk is to be remembered throughout the project, and a final solution implemented once the app is functional.

Additionally, this app is designed to be a tool to assist retention and access of information. However, a user could over-rely on the app, allowing it to make decisions for the user. If a negative result occurs from this overreliance, AlphaSoft could suffer a legal challenge. Therefore, a EULA is necessary to spell out the parameters of use of the app. Also, the implementation of the design should limit use to data access and not decision making.

3.3.3. Personnel Risks

In the realm of more likely scenarios, the AlphaSoft organization could fail to organize and work effectively. Should this occur, then the project will not be delivered on time to the client. To minimize this risk, AlphaSoft will use industry best practices for project management of a software program. These include, but are not limited to, weekly reports to the Project Manager, Agile Scrum development, prototypes and proof of concepts, and proper documentation that is kept up to date.

3.3.4. Organizational Risks

Organizational risks coincide with weak personnel risks. AlphaSoft realizes that teams do have conflicts which can hinder the overall outcome of the project. Low motivation could lead to reduced productivity. At AlphaSoft, everyone will work together and bring their special talents to the team. Open communication and discourse are encouraged. When problems are encountered, a quick resolution will be sought in order to keep the team happy and the proposed delivery date on time.

3.3.5. Scheduling Risks

A scheduling risk is the construction of an overly optimistic schedule, which can cause failure of the project. Scheduling risks can be compounded by errors or omissions in the scope of the project. The schedule will be realistic with hard delivery dates in order to deliver the final product on time. AlphaSoft strives to be the best and emphasizes no corners being cut. Time allocations are always realistic in order to deliver the best product.

3.3.6. Budgetary Risks

Another, and most crucial risk factor, is the budget. Having the correct financing is a major feature of any project. This requires the highest attention. The budget could potentially lead to the overall success or failure of the project. Incorrect and unrestrained financing will ruin the product. The solution for this is to make sure the financing is distributed wisely and that all the elements in AlphaSoft's software development are tight from the start.

3.3.7. Technical Risks

Technical risks are when the technology does not work as expected. This could be because of incompatible systems, version conflicts, or difficulties with using third party services. Technical risks are best prevented by doing a proof of concept and investigative development early in the process. The results of these endeavors will be incorporated into technical designs and test plans.

3.3.8. Impact-Probability Matrix

The Impact-Probably matrix categorizes the above events as either low, medium, or high outcomes. However, all risks should be considered important. The goal of risk analysis is to exam how the outcome and objectives of a project might change due to the occurrence of various risk events. Risks should be evaluated based on their potential impact and the impact they can have on a project's time, scope, quality, and cost. To do this, the significance of the above risks is displayed using the below Impact-Probability matrix and Project Impact Probability table.

	Probability			
Impact	**1 = High (80% ≤ x ≤ 100%)**	**2 = Medium High (60% ≤ x ≤ 80%)**	**3 = Medium Low (30% ≤ x ≤ 60%)**	**4 = Low (0% ≤ x ≤ 30%)**
A = High (Rating 100)	100 –Very High Exposure	80 –Very High Exposure	60 –High Exposure	30 – Moderate Exposure
B = Medium (Rating 50)	50 – High Exposure	40 – Moderate Exposure	30 – Moderate Exposure	15 – Low Exposure
C = Low (Rating 10)	10 – Low Exposure	8 – Low Exposure	6 – Low Exposure	3 – Very Low Exposure

Table 6: Risk Probability Matrix

Risk Type	Possible Risk Event	Probably	Impact	Score	Reasoning
External	Pandemic	100%	C	10	AlphaSoft has already fully adjusted to COVID-19 conditions. All members are highly encouraged to keep up with vaccinations. Only if a team member gets sick will there be an impact.
	Internet Outage	50%	B	30	Team members all have mobile hot-spots via their cell phones. They can also move to another location with internet access, like a coffee shop or library. There will be some downtime as they adjust.
	Damaged hardware	10%	B	15	Most team members have multiple computers and can switch to another fairly quickly. For those that do not, the downtime will be longer.
Legal	Lawsuit	1%	A	30	Until a release happens, a lawsuit is highly unlikely as the product does not impact any consumers. As the product will not be released until after product completion, a low percentage was given.
Personnel	Inexperience	70%	C	8	Team members are not experienced with the Flutter/Dart environment, but they are experienced at doing their jobs and associated tasks, which include learning new tools and environments.
Organizational	Human Error	90%	C	10	Human errors and inefficiencies are to be expected to have at least some impact on the duration of any project. However, if this grows to an above normal level, it could have an impact over the length and quality of the project.
Scheduling	Error or omissions	30%	C	6	These changes will likely result in a low to moderate impact to the time and cost of the project. However, additional work and

					labor will be need in order to comply with the scope of the project.
Scheduling	Client Changes Scope	100%	B	50	The client has already changed the scope of this project. However, AlphaSoft plans for this common occurrence in its scheduling. Only when the change is extensive will there be an impact to the schedule. The CCB will manage all requests from the client.
Budgetary	Client Pulls Funding	5%	A	30	A condition of AlphaSoft taking on this project is being properly funded. If the client does make payments in a timely manner, then AlphaSoft reserves the right to suspend the project until invoices are paid current.
Technical	Insecure Internet Traffic	10%	A	30	The internet has well-established standards and best practices for secure communications. AlphaSoft follows all of these. However, if a mistake is made, then rework of the product will be required.

Table 7: Project Impact Probably

3.4.Requirements

Detailed requirements will be in the SRS. This section will only include very high-level requirements.

3.4.1. Functional Requirements

- The software shall run as a mobile app.
- The software shall record conversations and convert their speech to text.
- The software shall interface with ChatGPT to process the text.
- The software shall offer options for handling the saved conversations and sending them to ChatGPT for processing.
- The software shall use ChatGPT to mine the conversations for data and display the results to the user.
- The software shall run as a browser extension
- The software shall read the information on a webpage.
- The software shall interface with the mobile app to select a conversation for processing by ChatGPT.
- The software shall complete a webpage using data processed by ChatGPT.

3.4.1. Accessibility

Accessibility is an integral aspect of our software development process. We are committed to ensuring that our software is accessible and usable by individuals of all abilities, including those with disabilities. Our team adheres to established accessibility standards, such as the Web Content Accessibility Guidelines (WCAG), and employs best practices to provide an inclusive user experience. We prioritize features like keyboard navigation, screen reader compatibility, color contrast, and clear visual indicators to enhance accessibility. By designing and developing our software with accessibility in mind, we aim to provide equal access and usability to all users, promoting inclusivity and diversity in our digital solutions.

3.5. Report of Tools

The team has a mix of Windows and Mac computers at their disposal. These devices are sufficient for the development of the documentation and software as well as testing.

3.5.1. Operating Systems

- macOS 11 (Big Sur)
- macOS 12 (Monterey)
- macOS 13 (Ventura)
- Windows 10
- Windows 11

3.5.2. Collaboration Software

- Microsoft Teams 1.6 (or most current version)
- Trello

3.5.3. Office Productivity Software

- Microsoft Office 2021
- Microsoft Office 365 (web based)
- Microsoft Visio
- UIzard web app @ https://app.uizard.io/prototypes

3.5.4. Software Development Tools

- Dart 3.0.3
- Eclipse 2023
- Flutter 3.10
- GPT-4 (ChatGPT)

3.6. Internal Information

The primary communication tool between members of the AlphaSoft organization is Microsoft Teams. All chat text, files, notes, transcriptions, documents, etc. shall be stored within Microsoft Teams with read/write access for all members and the client.

A private GitHub account (https://github.com/umgc/summer2023.git) shall be used as the sole code repository with read/write access available to all AlphaSoft members.

3.7. External Information

The client has provided AlphaSoft, via a teleconference, with the high-level idea for the program and MVP use cases. The client will also answer questions in Microsoft Teams regarding the project on an ad hoc basis. Additionally, the client has setup semi-regular meetings approximately every other Saturday; these are referred to as either Milestone or Checkpoint meetings. In these meetings, the client will provide feedback to AlphaSoft on the presented work and deliverables, if applicable. Additionally, the client has provided AlphaSoft with available consulting resources for IT and project guidance.

3.8. Change Control Board

A Change Control Board (CCB) is a means of managing requests for changes to the product. All requests for changes, either internally or externally, should be send to the Product Manager and Team Leads via email or Teams chat. These individuals will enter the request in a shared spreadsheet of requests under the “Joint Collab” Teams channel, i.e., the Request Log.

On a weekly basis, or as determined by the CCB, the CCB shall meet to discuss the proposed changes. The CCB can decide to 1) approve the change, 2) deny the change, 3) postpone a decision pending more information. All decisions shall be recorded in the Request Log. There must always be an odd number of attendees to prevent any tie votes. The Project Manager, or whomever they so designate, shall chair the board.

After each meeting, the chair of the CCB shall report back to the requestors the results of their decision.

4. Budget & Time Management

4.1. Work Breakdown Schedule

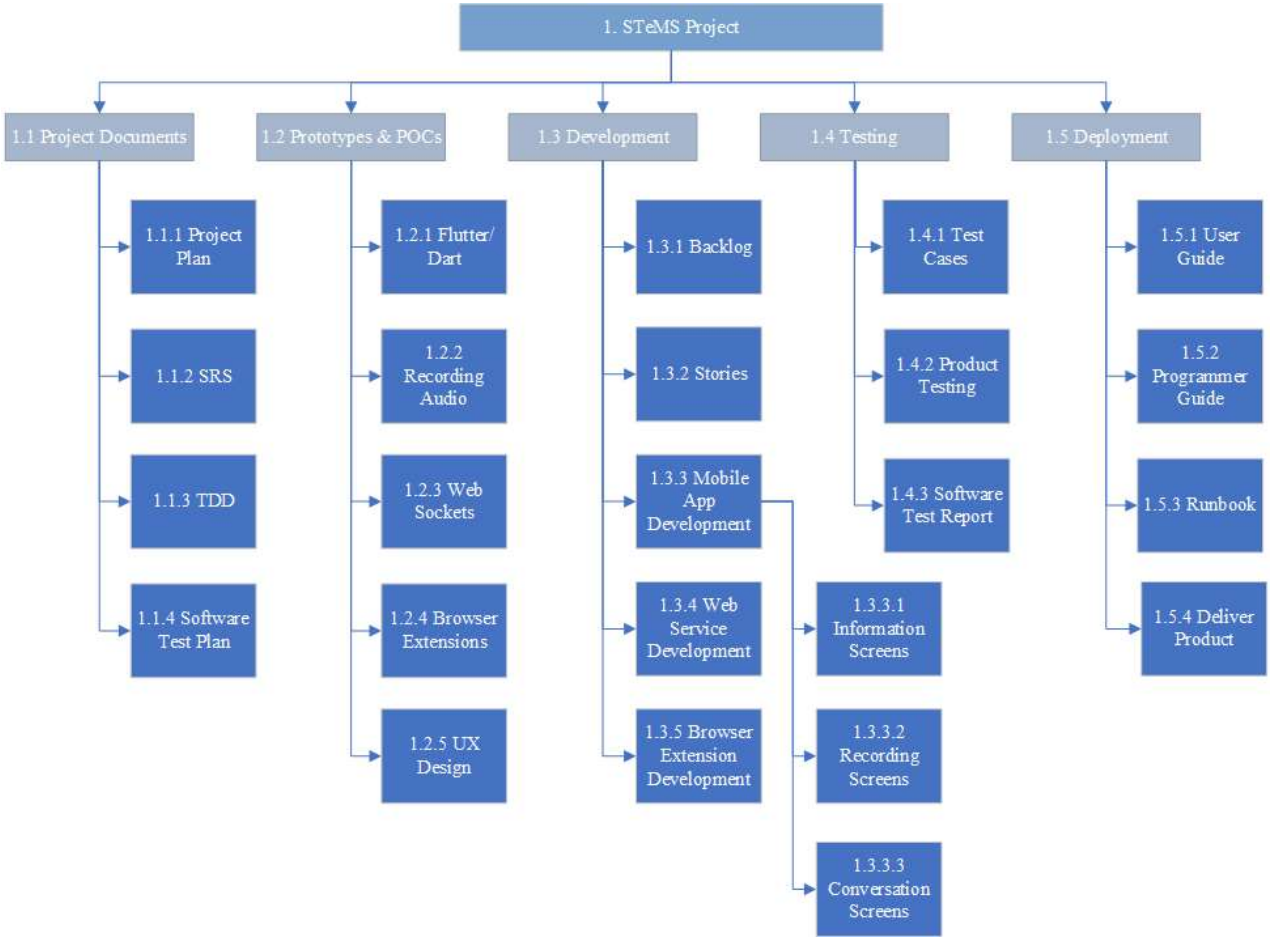

Figure 8: Work Breakdown Structure for the entire project

4.2. Work Breakdown Dictionary

Number	Name	Scope
1	STeMS Project	The entire project referred to by this Project Plan.
1.1	Project Documents	All project documents deliverables must be completed by project's end.
1.1.1	Project Plan	Describes what the project will do and how it will be done at a high level.
1.1.2	SRS	Specifies all requirements of what the product will do and how it will do it.
1.1.3	TDD	Specifies the technical details of what the product will do and how it will do it.
1.1.4	Software Test Plan	Specifies how the product will be tested to make sure it meets all requirements.

Number	Name	Scope
1.2	Prototypes and POCs	Covers all pre-development work to help flush out ideas, confirm expectations of new tools and components, and demonstrate concepts to others.
1.2.1	Flutter/Dart	These are development tools that developers must learn prior to starting work on this project.
1.2.2	Recording Audio	Confirm how audio recording works in Dart and develop a POC.
1.2.3	Web Sockets	Confirm how web sockets work in Dart and develop a POC.
1.2.4	Browser Extensions	Learn how to develop a multi-platform browser extension and develop a POC.
1.2.5	UX Design	Create the user interface and be able to demonstrate it to others to get their feedback.
1.3	Development	Covers all work involved in creating the product.
1.3.1	Backlog	A list of stories that need to be worked on but are not flushed out enough for developer to know what to do. When a story is created, it starts here.
1.3.2	Stories	Involves refining stories for every unit of work for the developers. Each story lists out criteria of what the program is supposed to do with enough information to test the story.
1.3.3	Mobile App Development	Developers need to create the mobile app program.
1.3.3.1	Information Screens	Developers need to create the Guided Tour and Info screens.
1.3.3.2	Recording Screens	Developers need to create the 3 screens related to starting, pausing, and stopping a recording.
1.3.3.3	Conversation Screens	Developers need to create the Conversation List screen and the Conversation Details screens.
1.3.4	Web Service Development	Developers need to create the web service.
1.3.5	Browser Extension Development	Developers need to create the browser extension program.
1.4	Testing	Covers all work involved in testing the product.
1.4.1	Test Cases	A list of tests that must be performed for each story.
1.4.2	Product Testing	Testers must test all of the program.
1.4.3	Software Test Report	Details the results of all product testing.
1.5	Deployment	Covers all tasks that must be completed to finish the project.
1.5.1	User Guide	A manual of how to use the product.
1.5.2	Programmer Guide	A manual to help developers that are new to the product understand why things were done the way they were.
1.5.3	Deployment and Operations Guide	A manual for how to deploy the product.
1.5.4	Deliver Product	All required deliverables are sent to the client.

Table 9: Work Breakdown Dictionary

4.3.Earned Value Management

Hours available will be used to gauge the work to do and done, according to this chart.

WBS Outcomes	WBS Outputs	Hours	M1	M2	Checkpoint	M3	M4
Project Documents	Project Plan	10	10				
	SRS	10	10				
	TDD	10		10			
	Software Test Plan	10		10			
Prototypes and Proofs of Concept	Flutter/Dart Framework	5		5			
	Recording Audio	5		5			
	Web Sockets	5		5			
	Browser Extensions	5		5			
	UX Design	10		10			
Development	Backlog	4			4		
	Stories	10			5	5	
	Mobile App Development: Information Screens	10			5	5	
	Mobile App Development: Recording Screens	30			15	15	
	Mobile App Development: Conversation Screens	30			15	15	
	Web Services Development						
	Browser Extension Development	30			15	15	
Testing	Test Cases	10		5	5		
	Product Code	30			15	15	
	Software Test Report	5				5	
Deployment	User Guide	10					10
	Programmer Guide	15					15

WBS Outcomes	WBS Outputs	Hours	M1	M2	Checkpoint	M3	M4
	Deployment and Operations Guide	15					15
	Deliver Product	5					5

Table 10: Earned Value Management

4.4. Timeline

Month	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Milestone
May							13	
	14	15	16	17	18	19	20	
	21	22	23	24	25	26	27	
June	28	29	30	31	1	2	3	Milestone 1
	4	5	6	7	8	9	10	
	11	12	13	14	15	16	17	Milestone 2
	18	19	20	21	22	23	24	
July	25	26	27	28	29	30	1	
	2	3	4	5	6	7	8	
	9	10	11	12	13	14	15	
	16	17	18	19	20	21	22	Milestone 3
	23	24	25	26	27	28	29	
August	30	31	1	2	3	4	5	Milestone 4

Table 11: Milestone Timeline

4.5. Budget

The budget covers all aspects related to the project's financial resources. It typically includes personnel, equipment, materials, external services such as server hosting, contingency plans, overhead costs, training and knowledge transfer, and stakeholder engagement costs. Because of our unique team makeup of remote workers, many of these expenses can be mitigated to minimize total cost to the client while maximizing value. Here we have focused on the foreseeable expenses.

The total budget of this project is estimated to be $254,214.00, as broken down in the below sub-sections.

4.5.1. Personnel

This project relies almost entirely on qualified human resources. For this effort, the team has been selected from the Graduate Software Engineering program at UMGC. In order to estimate salary expenses for this project, industry average salaries for each role on the team have been researched (via the Internet, www.indeed.com). Because the project is scheduled for completion in three months, the annual salaries were divided by 12 for the monthly expense. As most members of the team wear multiple hats, the highest salary has been chosen. No back-office support personnel will be required for this brief project.

All employees are salaried; thus, overtime is not a consideration. Performance bonuses of $1000.00 will be paid to each employee upon completion of the project, if so earned.

Name	Highest Paid Role	Monthly Salary
Blavat, Oleksiy	Software Architect	$10,544
Bond, Matthew	UX Designer	$7,818
Carter, Mackenzie	Test Engineer	$7,681
Mahbobi, Sayed shah	UX Design	$7,818
McAllister, Charlie	Software Developer	$7,906
McCool, Max	Technical Writer	$6,335
McLaughlin, Taylor	Test Engineer	$7,681
Powers, Michael	Team Leader	$8,353
Weaver, Daniel	Software Developer	$7,906
	Monthly Subtotal	**$79,723**

Table 12: Personnel Salaries

Estimated Salary Total: $239,169

4.5.2. Equipment and Materials

For this project there are no estimated costs for equipment and materials, as all team members have personal equipment on which they can work on the project. An employer can expect an average of $800 for computer equipment and office supplies. A new computer will only be charged to the project for a new employee or as a replacement for a damaged one owned by an existing employee.

4.5.3. External Services

There are several external services that this project will depend on that have their own costs.

The mobile application will be published on both iOS and Android operating systems. The publishing costs to list the application on the respective app stores are as follows:

BESie (Back End Service) that will connect the browser extension and the mobile application, must be hosted on a reliable server with minimum planned downtime. Amazon's EC2 service, also known as Amazon Elastic Compute Cloud, can host BESie reliably while providing flexibility in cost. EC2 does not require an upfront payment or long-term commitment and instead provides on-demand hourly rates. With a low amount of sporadic data being used in STeMS, EC2 becomes an excellent choice. The expected hourly rate using an EC2 server with 2 GB of memory is $0.0255. This equates to $18.62 per month.

These costs are rounded up and estimated below:

Service	Amount
Apple App Store	$100/year
Google Play Store	$25 one-time fee
Hosting of Service	$20/month
SSL Certificate	$100/year
Domain Name	$10/year
Code Signing Certificate	$150/year

Table 13: External Service Costs

Despite the project only running for 3 months, most costs must be paid for a full year at a time. The costs for just the length of the project are estimated at $445.00. For the first full year, charges are estimated at $625.00 with estimated annualized charges of $600.00 thereafter.

4.5.4. Contingency Plans

If the project is not yet complete at the end of the three-month period, team members can be brought back individually, as needed, for the completion of the project. Monthly salary costs from the Personnel Salary table above can be used to calculate those costs at that time.

4.5.5. Overhead Expenses

Overhead expenses cover the cost of "keeping the lights on." As all team members work remotely, there are no office overhead expenses. However, AlphaSoft covers the internet and phone expenses for their remote employees as they use these services in carrying out their responsibilities. While internet and phone plans vary, AlphaSoft offers a flat reimbursement in the amount of $60 for internet and $40 for phone plans. For all of AlphaSoft, that equals $1000/month in overhead.

4.5.6. Training and Knowledge Transfer

Upon delivery of the application, some training may be involved to educate the client on app specifics and maintenance. As it is expected that the client will take over the day-to-day maintenance and operations, time will need to be set aside to bring their support staff up to speed. This is included in our salary cost estimate and the final phase of our plan.

4.5.7. Stakeholder Engagement

Stakeholder engagement refers to any expenses it will take to communicate with the client and other stakeholders. In-person meetings will be kept to a minimum, so no budget will be made for that. Because the client is taking over the app from us, customer acquisition cost and marketing expenses will be left to them.

5. Phases

5.1. Initiation Phase

5.1.1. Dates

- Starting date: 13 May 2023
- Ending date: 3 June 2023

5.1.2. Summary

The Initiation phase of this project will involve gathering and understanding the project requirements, goals, and scope. It focuses on defining the overall vision and objectives, identifying key stakeholders, and creating a shared understanding of the project's purpose. This phase typically involves conducting workshops, brainstorming sessions, and collaborative discussions to elicit requirements and establish a clear direction for the development team. By the end of the Initiation phase, the team shall have a well-defined project vision, a prioritized backlog of user stories, and a shared understanding of the project's scope and objectives, setting the stage for the subsequent planning and development phases.

5.1.3. Activities

- Meet with the client to determine use cases and user needs
- Identify teams and roles for team members
- Finalize scope and use cases between teams
- Establish and utilize proper lines of communication between client, other team, and other stakeholders
- Create Project Plan and Software Requirements Specifications documents
- Establish scrum frequency and recurring meeting schedule

5.1.4. Deliverables

- Project Plan
- Software Requirements Specification

5.2. Planning Phase

5.2.1. Dates

- Starting date: 4 June 2023
- Ending date: 17 July 2023

5.2.2. Summary

The Planning phase is when the majority of the planning happens. The major activities during this phase are 1) breaking down the project into its component parts, 2) creating a project timeline, and 3) deciding the critical tasks. Also, it is at this point that specific features are confirmed for inclusion, postponed for a later release, or denied.

Once the SRS, architecture, and technical design are in place, user stories shall be created: User stories break up the technical work into manageable parts. Stories are initially added to a backlog. There they are refined until the team is satisfied that they are ready to be worked on. Then they are moved into a sprint for work in the Execution phase.

5.2.3. Activities

- Develop UX design
- Create a prototype

- Design the architecture of the software product
- Develop a test plan and test cases
- Create stories and plan sprints

5.2.4. Deliverables

- Updated Project Plan
- Updated Software Requirements Specification
- Technical Design Document
- Software Test Plan

5.3.Execution Phase

5.3.1. Dates

- Starting date: 18 June 2023
- Ending date: 22 July 2023

5.3.2. Summary

The Execution phase is when the bulk of the project is completed. It involves doing all the tasks thought of during the Planning phase as well as those created during the next phase, Review & Adaptation. Review & Adaptation is done in an iterative fashion until the Closure phase.

The software package shall be developed, tested, and released. Release involves making both a deployable app and a browser extension that can be added to a browser available. The tasks created in the Planning phase are further broken down into stories to be completed over sprints. A sprint is a time-boxed set of tasks to be done. AlphaSoft uses 1-week sprints to encourage more adaptability and quicker adjustments if needed. Each sprint also includes time for testing the completed stories. In the last sprint, final regression testing will be done to make sure the entire system works together as planned.

The Programmer Guide and Deployment and Operations Guide will also be generated in tandem with the development of STeMS. The Programmer Guide is a tool for new developers. It helps them understand how the program is supposed to work at a technical level, why it does or does not do specific things, and best practices for developing the program. The goal of the guide is expediate integrating new developers into the existing team so cohesiveness is maintained throughout the application.

The Deployment and Operations Guide, also sometimes referred to as an Operations Manual or Runbook, provides documentation about how to setup, compile, and run the application. This document is an invaluable reference for new and existing developers. For new developers, it is a means of transferring knowledge from the senior developers, preventing loss of valuable information through attrition of employees. For experienced developers, the Deployment and Operations Guide provided standardization and specific guidance for tasks, which might not be remembered from time to time.

5.3.3. Activities

- Create stories
- Manage sprints
- Development of the software product

5.3.4. Deliverables

- Updated Project Plan
- Updated Software Requirements Specification
- Updated Technical Design Document
- Updated Software Test Plan
- Programmer Guide

- Deployment and Operations Guide

5.4.Review & Adaptation Phase

5.4.1. Dates

- Starting date: 18 June 2023
- Ending date: 22 July 2023

5.4.2. Summary

The Review & Adaptation phase of this project will be dedicated to the evaluation of the team's current progress. The current state of both the application and project, as well as the team's overall performance will be taken into consideration along with provided customer feedback. These factors will be used to review the current set of requirements and project plan. Any required changes to the development approach will be made and the proper documentation will be adjusted accordingly. This phase is done iteratively in alternation with the Develop phase.

5.4.3. Activities

- Gather and review customer feedback
- Review current timeline in PP
- Review current requirements
- Modify/add new requirements
- Adjust PP timeline/budgets
- Adjust SRS, TDD, STP, and other affected documents
- Determine tasks for next sprint

5.4.4. Deliverables

- None

5.5.Closure Phase

5.5.1. Dates

- Starting date: 23 July 2023
- Ending date: 05 August 2023

5.5.2. Summary

The Closure phase is when the project is prepared to be closed out and completed. Most importantly, it involves preparing the final documentation and deliverables to the client. However, it also is a time for the project members to reflex on the positives and negatives of this project so they may learn from their mistakes, learn from each other, and become better at future projects.

5.5.3. Activities

- Team reviews the positives and negatives of the project to learn
- Create the User Guide
- Finalize the Test Report
- Update all prior deliverables
- Provide training to the client and their staff on the use and maintenance of the product.

5.5.4. Deliverables

- Updated Project Plan
- Updated Software Requirements Specification
- Updated Technical Design Document
- Updated Software Test Plan
- Updated Programmer Guide
- Updated Deployment and Operations Guide
- User Guide
- Test Report