

Software Development Project Plan

(CogniOpen - Nurturing Memory Wellness for Cognitive Impairment)

Submitted to:

University of Maryland Global Campus in partial fulfillment of the course Software Engineering Capstone (SWEN 670)

Submitted By: Team B

Fall Semester 2023

Version 1.1

September 23, 2023

Department of Software Engineering

University of Maryland Global Campus (UMGC)

Document Control

Document History

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| --- | --- | --- | --- |
| Version | Issue Date | Changes | Change Made By |
| 1.0 | 08/28/2023 | Initial Draft | Team B |
| 1.1 | 09/20/2023 | Add software version numbers APA compliance edits | Zachary Cappella  Ed Devine |
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# Project Information

CogniOpen is a novel mobile application designed to offer extensive support and aid to people experiencing cognitive impairment. The application showcases a user-friendly interface and a comprehensive range of functionalities to augment cognitive capacities, foster emotional welfare, and cultivate a feeling of inclusion within a nurturing collective. CogniOpen aims to enhance the quality of life for those affected by cognitive impairment and mitigate the challenges they face daily by employing customized resources and fostering community involvement.

The development of CogniOpen leverages the synergistic integration of Dart and Flutter, enabling a fast and native-grade application experience across several platforms. The app's success is ensured by using a user-centered design approach that incorporates insights from people with dementia, caregivers, and medical experts. CogniOpen will be made available on both iOS and Android platforms, hence facilitating extensive utilization.

## Purpose

The CogniOpen Project Management Plan (PMP) outlines the methodologies and milestones for each deliverable, clarifying the approach the project team will use to conceptualize, supervise, and accomplish activities. The schedule for delivering each critical milestone will be explicitly outlined. The intended recipients of the CogniOpen PMP include various project stakeholders such as the client, project sponsor, senior leadership, and the project team. The primary objective of this PMP is to establish the specific procedures that the CogniOpen project team will follow for the entirety of the project's lifespan, to benefit both the project team and all involved stakeholders.

During the implementation of the project, it is expected that adjustments to the PMP will be required. As necessary changes become evident, this document will be updated. The final plan will include a collection of documents providing evidence for decisions made during the project’s development. These documents cover activities such as gathering and confirming requirements, making technical design choices, establishing criteria for user acceptance testing, and other necessary documents that support the application throughout its entire life cycle.

## Need Statement

Dementia is a comprehensive term that encompasses a collection of cognitive impairments with significant impact on memory recall, cognitive processing, behavior, and the ability to do everyday tasks. Individuals who have been diagnosed with dementia can face a range of obstacles depending on the stage and type of dementia they are experiencing. Memory impairment is a characteristic manifestation of dementia, ranging from sporadic lapses in recent memory to the incapacity to identify immediate family members or cherished companions. The formerly familiar activities of clothing, bathing, cooking, and administering medications transform, presenting people with difficulties that they must contend with, ultimately resulting in a significant decline in their ability to make independent decisions and act autonomously. The exacerbation of the loss of personal agency is further compounded by the prevalence of disorientation and confusion commonly experienced by those with dementia.

This situation requires caregivers to provide help, which can impose considerable physical and emotional burdens on them. The enduring responsibilities linked to providing care for an individual with dementia give rise to several types of burden, including emotional, physical, and financial. The perpetual requirement for constant monitoring and supply of care is a persistent obstacle contributing to the caregivers' perception of excessive stress. Team B aims to reduce the frequency of caregiver intervention through the application of AI technologies to automate tasks such as identification of objects and persons, reminders of commitments, and summarization of previous conversations.

## Vision Statement

Our vision for CogniOpen is to develop a transformative solution that enhances the lives of dementia patients and individuals with cognitive impairment through innovative technology and compassionate care. We envisage a future where people with memory issues will feel renewed empowerment, engagement, and connection. CogniOpen will serve as a beacon of hope by nurturing an inclusive community where users can enhance their cognitive abilities, find solace in shared experiences, and improve their overall well-being. By bridging the divide between technology and dementia care, we hope to pave the way for a more compassionate and supportive voyage for dementia patients and their caregivers.

## Definitions, Acronyms and Abbreviations

|  |  |
| --- | --- |
| Term | Definition |
| AI | Artificial Intelligence |
| API | Application Programming Interface; a method for different applications to communicate with each other. |
| App | Application; a program or piece of software designed to fulfill a particular purpose. |
| ChatGPT | An AI language model, designed to understand and generate human-like text. |
| Dart | Dart is a client-optimized programming language for developing fast apps on any platform. |
| Flutter | A programming framework designed to build, test, and deploy mobile, web, desktop, and embedded apps from a single codebase. |
| Mobile Device | A smart phone, tablet, or other portable device, typically with an Android or IOS operating system. |
| OS | Operating System |
| UI | User Interface; the components of a system that users can utilize to control the system. |
| UX | User experience; the processes and behaviors through which a user controls and receives feedback from a system. |

Table 1 – Definitions, Acronyms, and Abbreviations

## Stakeholders

The achievement of the CogniOpen project's objectives is contingent upon the involvement of several stakeholders who contribute to and influence the project's outcomes.

Signatories play a crucial role in formally authorizing and endorsing the goals and initiatives of the project. They are positioned at the forefront of this process. Customers, being the primary recipients, actively contribute by offering insights, opinions, and needs that influence the functionality and user experience of the application. Project sponsors play a crucial role in providing essential financial backing, offering strategic guidance, and advocating for the project's sustainability and compatibility with the broader aims of the organization.

The project team consists of several professionals, including project managers, product owners, software developers, quality assurance specialists, and business analysts. Together, they utilize their experience and committed efforts to successfully build CogniOpen.

The project's trajectory can be influenced by external entities, including partnering organizations and industry stakeholders, through collaborative efforts, partnerships, and the exchange of valuable knowledge. Ultimately, other stakeholders, including carers, healthcare professionals, and advocacy organizations, who possess a vested interest in the project's triumph, provide significant viewpoints and contributions that enhance the project's objectives and influence.

Collectively, this extensive network of persons and organizations forms an intricate web of influence that molds the growth and final consequences of CogniOpen on those who experience dementia and cognitive impairments.

|  |  |
| --- | --- |
| Name of Stakeholder | Role |
| Dr. Mir Assadullah | Client/Professor |
| Roy Gordon | Project Mentor |
| Robert Wilson | DevSecOps Mentor |
| Edward Devine | Project Manager |
| Abebe Natea | Software Engineer |
| Alexis Shannon | Software Engineer |
| Eyerusalme Gebrehiwot | Software Engineer |
| Gabriel Gomes | Software Engineer |
| John Hamilton | Software Engineer |
| Malachi Jamison | Software Engineer |
| Sean Mirani | Software Engineer |
| Zachary Cappella | Software Engineer |

Table 2 – Stakeholder Information

## Project Methodology

To manage the CogniOpen project, the project team has chosen to use Lean-Agile Software development. This methodology, augmented by Feature-Driven Development (FDD), provides a flexible, customer-centric framework for developing high-quality software. This method is founded on Lean thinking and Agile practices and combines efficiency and collaboration. Below is the rationale behind why the project team decided to use FDD:

**Consumer-Centric Value:** At its essence, this strategy comprehends and satisfies consumer requirements. FDD focuses on designing beneficial features that directly address consumer needs. The method ensures that software is aligned with providing actual value by identifying and prioritizing key features according to their impact.

**Iterative Incremental Development:** Lean-Agile Six Sigma FDD utilizes iterative cycles to break down projects into "features." Each represents functionality in its entirety or a user requirement. Encouraged are rapid development, regular evaluation, and adaptability.

**Collaboration and Cross-Functional Teams:** In Lean-Agile FDD, collaboration is essential. Cross-functional teams comprised of developers, testers, designers, and subject matter experts collaborate closely to facilitate effective communication and a unified development effort.

**Feature-Centric Development:** FDD emphasizes the creation of manageable software features. This methodology allows teams to concentrate on functional, valuable components that integrate seamlessly.

**Progressive Refinement and Quality:** The Lean Agile FDD focuses on continuous enhancement. The outlining, iterative detailing, and rigorous testing of features result in higher-quality deliverables. Lean Agile development enhanced by FDD combines efficiency, adaptability, and collaboration. This promotes focused, iterative, and feature-driven development, which is aligned with consumer requirements and enables rapid adaptation. Lean Agile and FDD both embrace adaptation in software development. With a focus on features, it is effortless to adapt to changing requirements.

## Project Tools and Resources

The success of the CogniOpen application's development is contingent upon establishing a resilient framework, including various tools and resources meticulously selected to augment collaborative efforts, optimize operational processes, and yield a result of superior caliber and significance. These tools function as the technological infrastructure, enabling the development team to move smoothly through different stages of the software development lifecycle.

Microsoft Teams and SharePoint are very effective tools for facilitating collaboration within a team since they facilitate efficient communication and the seamless sharing of project-related data. Microsoft Teams facilitates synchronous talks, video conferencing, and efficient information exchange, whereas SharePoint offers a centralized document repository, providing systematic document management and improved collaboration.

Microsoft Word and Excel are widely used software applications in many professional settings. Microsoft Word is commonly utilized for creating complete project documentation and reports. It provides users with an organized format that facilitates clear and effective communication. Microsoft Excel facilitates data analysis, monitors progress, and manages essential project-related data.

Microsoft Project is a software tool that offers comprehensive project management functionalities. It enables users to plan, schedule, and track project activities, resources, and schedules effectively. By utilizing Microsoft Project, project managers may ensure efficient project management and monitor progress effectively.

GitHub and GitHub Desktop are software solutions that facilitate version control and collaborative code management. GitHub provides a comprehensive framework for managing code repositories, promoting efficient cooperation among software professionals. GitHub Desktop offers a user-friendly interface for engaging with Git repositories, streamlining the process of managing version control activities.

Dart and Flutter are the foundational components for CogniOpen's development, with Dart being the programming language and Flutter being the cross-platform framework. Dart provides developers with the capability to construct apps that are both efficient and responsive, while Flutter facilitates the development of cross-platform experiences by utilizing a unified codebase.

Using Pencil and Adobe XD as design tools significantly enhances the application's aesthetic and user experience design. Using Pencil is advantageous in generating wireframes and prototypes, as it assists in conceptualizing app layouts. In contrast, Adobe XD emphasizes creating user interfaces and interactive prototypes to guarantee an intuitive and captivating user experience.

Android Studio is an integrated development environment (IDE) that provides a comprehensive platform for creating Android applications. The package of tools facilitates the writing, debugging, and testing of Android applications, providing a smooth and uninterrupted development process.

Azure DevOps is a multifaceted DevOps and project management solution that optimizes the development workflow. The concept of software development infrastructure comprises several components, such as source control, automated builds, and project tracking. These components work together to facilitate a cohesive and efficient workflow in the software development process.

The tools and resources in question jointly constitute the basis for constructing the CogniOpen application. Each tool within the development process has a distinct role, contributing to the project's potential to provide a revolutionary solution that effectively caters to the requirements of persons impacted by memory difficulties.

|  |  |  |  |
| --- | --- | --- | --- |
| **Tool** | **Purpose** | **Description** | **Version** |
| Microsoft Teams | Communication & Collaboration | Microsoft Teams provides a platform for team communication, video conferencing, chat, and collaboration, allowing the development team to communicate efficiently. | 1.6.00.24065 |
| Microsoft Teams | Document Management & Collaboration | SharePoint offers document management, version control, and collaboration features, facilitating organized document sharing and team collaboration. | 1.6.00.24065 |
| Microsoft Word | Documentation & Reporting | Microsoft Word is used for creating and formatting project documentation, reports, and various project-related written content. | 16.77.1 |
| Microsoft Excel | Data Analysis & Tracking | Microsoft Excel enables data analysis, tracking project progress, creating spreadsheets, and managing project-related data. | 16.77.1 |
| GitHub | Version Control & Collaboration | GitHub is a platform for version control, collaboration, and managing code repositories, aiding collaborative development and code management. | N/A |
| GitHub Desktop | Git Client | GitHub Desktop provides an easy-to-use graphical interface for interacting with Git repositories, simplifying version control tasks for developers. | 3.3.2 |
| Dart | Programming Language | Dart is a programming language used for building applications, including the development of the CogniOpen app. | 2.16 |
| Pencil | Wireframing & Prototyping | Pencil is a tool for creating wireframes and prototypes, helping visualize app layouts and interactions during the design phase. | 3.1.1 |
| Adobe XD | User Experience Design | Adobe XD is used for designing user interfaces and interactive prototypes, facilitating the creation of the app's visual design and user experience. | 57 |
| Flutter | Cross-Platform Framework | Flutter is a framework for building cross-platform apps using a single codebase, enabling the development of the CogniOpen app for various platforms. | 3.13 |
| Android Studio | Integrated Development Environment (IDE) | Android Studio is an IDE used for developing Android apps, providing tools for coding, debugging, and testing Android applications. | 2022.3.1 |
| Azure DevOps | DevOps & Project Management | Azure DevOps offers tools for managing the development process, including source control, automated builds, and project tracking, ensuring a streamlined development workflow. | Dev19.M227.1 |

Table 3 – Tool Descriptions & Version Information

# 2. Scope Management

The main goal of the CogniOpen initiative is to develop a mobile app that helps people struggling with cognitive impairments, especially those affected by dementia. The Software Engineering Project Capstone class will start this project and finish it in the fall of 2023. The project will see coordinated efforts in cooperation and collaboration between the two teams, Team A and Team B, to accomplish its effective implementation. This project's blueprint includes the goals, objectives, and constraints that Team B believes are necessary to ensure the project's successful conclusion.

## 2.1 Project Scope

The CogniOpen application's scope is focused on developing a comprehensive and user-centric platform to assist those suffering from cognitive impairments, particularly those suffering from dementia. The software is intended to provide a variety of features and functions that improve cognitive ability, increase emotional well-being, and develop a feeling of community. The following major components are included in the project scope:

* Audio Recording & Voice Attribution
* ChatGPT Integration & Analysis for commitments
* Video capture & object identification
* Voice interface “Ok google...” “Hey Siri...”
* Learning component where application “recognizes” user’s things

CogniOpen will be developed as a mobile application utilizing Dart and Flutter and will be accessible for iOS and Android devices. The program will be created using user-centered principles, including input from people living with dementia, carers, and medical experts to assure its usefulness and usability. The scope will involve extensive testing, refinement, and continual improvement to produce a stable and dependable application that has a beneficial influence on the lives of its users. While the application's major focus is on those with dementia, its advantages can extend to caregivers and anybody seeking memory enhancement and emotional well-being assistance.

## 2.2 Areas of Expansion

The following areas have been identified as potential additions to the scope of this project. These are considered lower priority than the primary features and will only be developed if time allows. Any features not included in the final product will be removed from this section.

Innovative features of CogniOpen are intended to empower users and cultivate a supportive environment:

**Memory Boosting workouts and Activities:** CogniOpen will offer a collection of scientifically developed memory-boosting workouts and activities. These activities are designed to activate several cognitive functions, promote memory recall, and improve mental agility.

**Smart Reminders and Alerts:** The application incorporates a sophisticated reminder and alert system to assist users in managing daily tasks, appointments, and medication regimens, thereby reducing the tension associated with forgetfulness.

**Digital Memory Journal:** CogniOpen will contain an easy-to-use digital memory diary. This journaling function allows users to record their ideas, emotions, and experiences, preserving personal memories and boosting self-expression.

**Memory Gallery:** By adding images, users will be able to construct digital memory galleries. Users will be able to revisit cherished memories, discuss key life events with loved ones, and facilitate storytelling through these galleries.

**Supportive Community Platform:** CogniOpen will have a dedicated community forum where users may interact, share stories, offer mutual support, and engage in meaningful debates. The goal is to lessen feelings of loneliness by building relationships amongst people who have common experiences.

**Emergency Contacts and Health Data:** The app will allow users to save important emergency contacts as well as medical information. This function improves user safety and offers crucial information to caregivers.

**Interactive Calendar:** CogniOpen will incorporate an interactive calendar to assist users in managing schedules, remembering key dates, and graphically tracking activities. Users will be able to keep organized with the help of visual signals and event monitoring.

**Personalized Interface:** The application's interface will be customizable to accommodate different cognitive abilities and preferences. This feature improves accessibility and provides a pleasant user experience.

## 2.3 Additional Documents

The anticipated deliverables encompass a comprehensive range of essential components, each playing a distinct role within the project's structure. These include:

1. Project Plan: A thorough outline detailing the project's scope, milestones, allocated resources, and projected timeline.
2. Software Requirements Specification: A detailed document articulating the specific functionalities and requirements the software application must incorporate.
3. Technical Design Document: An extensive architectural blueprint that elucidates the high-level design, data flow, component structure, and interface details of the software.
4. Software Test Plan: A structured strategy that elaborates on the testing methodologies, scope, and approaches to assess the application's performance, reliability, and functionality.
5. Deployment and Operations Guide: A comprehensive manual providing step-by-step guidance on deploying software in various environments and effectively managing its ongoing operations.
6. Programmer Guide: A reference resource designed to assist developers in comprehending the codebase, its organization, and the established conventions.
7. User Guide: A user-centric handbook offering lucid instructions on navigating and effectively utilizing the software application.
8. Test Report: A documented account that outlines the testing procedures, outcomes, encountered challenges, and the remedies applied throughout the software's developmental stages.
9. Application Code: The foundational element of the project encompasses the actual programming code that breathes life into the envisioned software application.

Collectively, these deliverables form a cohesive framework pivotal to the project's execution, ensuring a systematic approach to development, meticulous testing, smooth deployment, and user engagement.

## 2.4 Team Specific Scopes:

The scope of this project will be divided between two teams, Team A and Team B. Each team will work independently to develop separate features that will be combined into a single product in the later stages of the project. The areas of responsibility are detailed below.

### Team B

1. Core Functionality: The application's core functionality includes several critical characteristics that define its key activities together. First and foremost, the basic front-end ensures a user-friendly and visually appealing interface, hence improving the user experience. Meanwhile, the main backend handles server-side tasks such as data processing and user interaction, ensuring the overall functionality of the program. The app's core connectors connect it to third-party services, extending its possibilities. The ability to securely log into the app allows for user authentication via a variety of techniques, protecting user accounts. Logging out of the app is vital for both privacy and security, as it allows users to end their sessions. Finally, effective access management offers administrators and users unique privileges, allowing them to regulate who has access to certain features and data within the app. These fundamental functionalities, when combined, establish a solid basis for the application's usability, security, and performance.
2. Virtual Assistant: A virtual assistant feature in an app typically involves an AI-powered chatbot or voice-activated assistant. It allows users to interact with the app using natural language, voice commands, or text input. Virtual assistants can provide information, answer questions, set reminders, or perform tasks within the app, enhancing user convenience and engagement.
3. Audio: The audio feature encompasses various functions related to sound that the user interacts.

### Team A

Team A is responsible for overseeing the comprehensive development of the application's main features. Specifically, they are responsible for the front-end and back-end aspects of three essential components: Video, Photo, and Gallery. Team A will be responsible for designing and developing the user interfaces and experiences (front-end) for these features, ensuring that they are aesthetically pleasing and easy to use. In addition, they will manage the server-side operations and data processing (back-end) required for these features to function properly. This dual emphasis on front-end and back-end development is required to provide a seamless and integrated experience for users interacting with the Video, Photo, and Gallery features of the application.

# 3. Change Management

Change management is a process through which requests for amendments to the agreed requirements and work outline are submitted. Changes pose a risk to the timely completion of tasks and on schedule completion of the application. Ensuring only essential changes are accepted is deemed a best practice to limit scope creep and focus available resources on critical tasks.

## 3.1 Change Request Types

Change requests can come from internal and external entities.

Internal entities would include Team B, Team A on agreed upon requirements, and the client on agreed upon requirements. External entities would include Team A, the client, external agencies or policy makers, and other unseen adopters of the application.

## 3.2 Change Request Submission

In collaboration with Team A, a change request form will be developed. This form completion and submission to the team leader will trigger a change request. The change request will include the initial request, the substantial change or changes, the purpose, and desired outcome of the change. Requestors should also make note if this request spawned from a policy or legislative change that would impact the application.

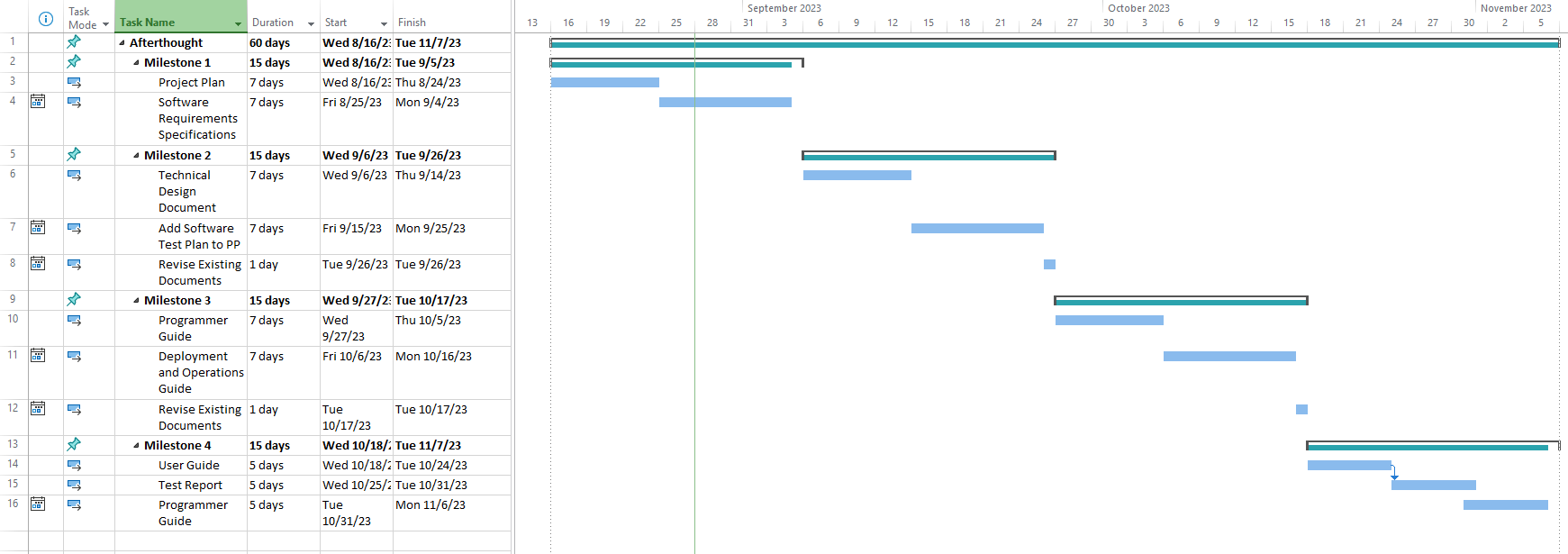
## 3.3 Change Request Review

Change requests will be reviewed by the full team during stand-up meetings. These meetings occur weekly. The full Team B will have an opportunity to review the request, ask questions, deliver feedback, and voice their opinion of the impact the change would have on their assigned work. A risk management analysis will be conducted by the team to assess the impact on the project goals, budget, scope, timeline, technical ability, and feasibility. Once a majority of the team is either in favor or opposed to adopting the change, the decision will be communicated to the requestor via email. The request form will be saved in shared files on Microsoft Teams for record keeping.

# Time Management

Each milestone takes 15 days to complete. The shortest tasks to complete throughout the whole project schedule will take only one day. It will take one day to revise existing documents during Milestone 2, and it will take one day to do the same for Milestone 3. Most of the tasks take up to 7 days, the longest of the tasks in the project schedule. The in-house development will approximately take 12 weeks. each employee's workload has been allocated at 20 hours per week. This arrangement spans a total of 240 hours per employee over the 12-week duration.

## 4.1 Project Plan

Figure 1 – Project Plan Gantt Chart

# Cost Management

We have outlined the budgetary aspects for the in-house development of the CogniOpen application by our software development team, denoted as Team B. The stipulated timeline for this endeavor is set at 12 weeks. The budget has been computed utilizing the hourly rates of our employees.

## 5.1 Personnel

To ensure a comprehensive coverage of project requirements and potential contingencies, each employee's workload has been allocated to 20 hours per week. This arrangement spans a total of 240 hours per employee over the 12-week duration. An additional buffer of 20% has been factored into the budget to address any unforeseen circumstances that might arise.

The role of a Project Manager commands an hourly rate of $85.00, while the Software Engineers contribute their expertise at an hourly rate of $40.00. Within Team B, there exists a composition of 1 Project Manager and 10 Software Engineers, all of whom are poised to contribute synergistically to the success of the CogniOpen project.

## 5.2 Equipment

Each team member will use their personal computer and peripherals to complete the project. For testing the application, simulators will be used to avoid the need for separate mobile devices.

## 5.3 External Services

There are external services that the application will depend on. The mobile application will be published on iOS and Android operating systems. The Apple App Store has a $99 annual fee for the Apple Developer Program. The Google Play Store has a one-time $25 registration fee for a developer account.

((projectManagerHrRt + (10 \* softwareEngineerHrRt)) \* 20) \* 12 \*1.2 + ExternalServices= Allocated Budget

## 5.4 Summary

The calculated budget for the CogniOpen project stands at $139,804.00. This allocation encompasses a comprehensive assessment of human resources, potential difficulties, and the dedicated efforts of our skilled professionals.

## 5.5 Quality Management

Because the CogniOpen application must be carefully designed to meet the needs of users experiencing cognitive impairment, the quality of the final product is of unique importance. To ensure the necessary level of quality is delivered, the following processes will be followed:

* Ownership of quality: The individual engineer performing a given task has the ultimate responsibility for its result. That person is required to understand and enforce compliance to requirements and specifications.
* Self-Inspection: As soon as an individual has completed a task, they will perform measurements to ensure conformance of the result to requirements and specifications.
* Quality Control: When an engineer discovers a defect that cannot be addressed immediately, they will report it to a change control process that will allow it to be tracked automatically. (TBD, most likely Azure DevOps board)
* Quality Review: Following completion of a task, an engineer other the one who completed it will verify the result conforms to requirements and specifications.

The following sections will discuss the software test plan and processes needed to implement the level of quality needed to meet our end user's needs.

# Software Test Plan

The following section will cover the test plan for the CogniOpen application. It will cover the purpose of the content, the scope of the test plan, the functional and non-functional requirements, the testing methodology, the bug priority levels, and the test cases.

## 7.1.1 Purpose

The software test plan is designed to enumerate the testing process for the CogniOpen application through development to delivery to the Customer. The software test plan is subject to change as the application development progresses and the requirements change from the Customer. With an agile project, requirements are subject to high volatility, thus, the software test plan needs to be able to adjust accordingly. This should be used as a guide to testing, how the team should think about test cases, and how to integrate testing into the development phase to minimize bugs that make it to integration.

## 7.1.2 Scope

The software test plan will cover four main topics: functional and non-functional requirements, testing methodologies, bug priority level, and the test cases that will be used to test the CogniOpen application. This document will not cover site-based security testing, or any other post-delivery testing activities.

## 7.1.3 Functional and Non-Functional Requirements

The software test plan for the CogniOpen application will be focused on testing the implementation, usability, and performance of the developed code against the functional requirements. Functional requirements are requirements that affect how the system functions – the user can enter their username and password, the system shall validate and sanitize user input, etc. The software test plan will not cover non-functional requirements. Non-functional requirements are requirements that do not affect how the system functions or performs against the business logic. These types of requirements may include, but are not limited to, how the application looks, the build system, or deployment technology.

## 7.1.4 Testing Methodology

The CogniOpen software development team takes a three-pronged approach to application testing and development: develop unit test cases during development and ensure that all unit tests pass before code is merged; functionally test new features when they are complete, then test whether those features integrate seamlessly into the rest of the platform; and user acceptance testing.

## 7.1.4.1 Test Driven Development

Each software component that is developed shall have an associated suite of unit tests that ensure that the business logic developed to implement the system requirements are performing as intended. These unit tests shall cover positive path and negative path user input testing to ensure that the software is properly handling valid and invalid data that is passed to it. This will reveal flaws in development before the code reaches the end user or configuration management.

## 7.1.4.2 Integration and Functional Testing

Each feature that is developed and merged to the main code branch shall be functionally tested by a Test Engineer to ensure that the software is meeting the expected functional requirements. If the Test Engineer finds bugs during the functional testing, the Software Developer responsible for that feature will resolve the bug and resubmit the feature for functional testing. Once the Test Engineer approves the feature for integration, the Test Engineer will ensure that the new code has not broken any existing features.

## 7.1.4.3 User Acceptance Testing

User acceptance testing will be used in two ways. The CogniOpen team will present features to the Customer as they become available to demonstrate. This will ensure that the Development Team is meeting Customer expectations and that there have been no misunderstandings in system needs and requirements.

Additionally, the CogniOpen team will use a focus group to demonstrate the capability to for feedback. This focus group would ideally be entirely anonymous, to ensure that feedback can be as honest as possible. The CogniOpen team will provide the focus group the application documentation, a functioning instance of the application, and let the focus group work through it themselves. The feedback that the focus group will provide will give the team invaluable feedback about how people are interacting with the system. This feedback will help improve the overall look, feel, and the functionality of the system.

## 7.2 Bug Priority Level

There will be four bug priority levels for the CogniOpen application: blocker, critical, major, and minor. The following sections will enumerate these levels and describe what they are intended to be used for.

## 7.2.1 Blocker

A bug with priority level blocker is considered the most severe. A blocker bug is a defect within the system that makes a feature entirely unusable. An example of a blocker bug would be if a login button never redirected the user to a home page. These types of bugs require immediate Software Developer engagement and action.

## 7.2.2 Critical

A bug with priority level critical is considered very important, but there is some sort of workaround for the user to achieve their goal. An example of a critical priority level bug would be if a user with an extraordinarily long name could not register an account because the database was not designed to allow for a name that long. This bug would greatly impact the user of the system but could possibly be worked around. These types of bugs require Software Developers to intervene quickly, but not immediately.

## 7.2.3 Major

A bug with priority level major is considered a standard bug that does not have huge impact on the end user. An example of a major priority level bug would be if a form made an optional field required. Although a user could enter placeholder information to get through the problem, the form should be updated to have the appropriate controls, even though a user could find a way around it. These types of bugs require Software Developers to take action after their current priority tasking is complete.

## 7.2.4 Minor

A bug with priority level minor is considered trivial. An example of a minor priority level bug would be a typo in the UI. While it may detract from the application’s professional look and feel, it does not have an impact on the end user’s ability to interact with the system. These types of bugs should be addressed whenever Software Developers have the time to look for new work.

## 7.3 Test Cases

This section of the document will be updated in a future version.

# Staffing Management

The staffing for this project has been set by the enrollment of the SWEN 670 capstone section. For this reason, it is not expected that any new engineers will be added to the development team or that the project client or mentors will change. In the event that an engineer is removed from the course, their responsibilities will be immediately transferred to other engineers in a method determined by the project manager and agreed upon by the remaining developers.

The following section will breakdown the roles and responsibilities of each stakeholder and engineer within the CogniOpen delivery pipeline.

## 8.1 Roles and Responsibilities

The CogniOpen application will have a number of different stakeholders and contributors. The following section is going to outline those specific individuals; the roles that they play in the development, testing, deployment, and acceptance of the application; and what their associated responsibilities are.

### 8.1.1 Customer

The Customer is the primary driver for the application development. They are the person that will provide the development team the requirements, receive demonstrations of capabilities, and approve the final deliverables.

### 8.1.2 Project Manager

The Project Manager is the main driver of the development cadence. They are the singular person that should be driving milestone deliverables, course correcting the team when they are off topic, interfaces with the Customer, and provides the team stability.

### 8.1.3 Technical Writer

A Technical Writer is a member of the development team that is responsible for the documentation that will be used by the Customer and the various users of the application. The Technical Writer will develop technical documentation for how to use and install the application, user guides, developer guides, and any other artifacts needed by the Customer or the Project Manager.

### 8.1.4 UI/UX Developer

A UI/UX Developer is responsible for building the various front-end, user-facing, interfaces that the CogniOpen application will feature. These developers will use best practices for user-interface design, ensuring that people suffering from cognitive deficiencies can easily interact with the application every time they use it.

### 8.1.5 Software Developer

A Software Developer is responsible for building the backend features necessary to handle the CogniOpen business logic. Software Developers will be implementing the specific software functional requirements into the code, which will be tested by the Test Team.

### 8.1.6 Test Engineer

A Test Engineer is an individual that will be validating the CongiOpen software that has been developed by the Software Development Team against the requirements that have been determined by the Customer and the Project Manager.

### 8.1.7 Configuration Manager

The Configuration Manager is responsible for ensuring the code, artifacts, and supporting documentation checked into source control are following best coding practices, will not cause merge conflicts, and are reviewed carefully.

## 8.1.8 Assigned Roles

The table below will outline each individual stakeholder and contributor to the CogniOpen application and their associated role(s).

|  |  |
| --- | --- |
| Name | Roles |
| Dr. Mir Assadullah | Customer |
| Roy Gordon | Project Manager Mentor |
| Robert Wilson | DevSecOps Mentor |
| Abebe Natea | Technical Writer  Lead Test Engineer |
| Alexis Shannon | Software Developer  Business Analyst |
| Edward Devine | Project Manager  Lead Business Analyst |
| Eyerusalme Gebrehiwot | UI/UX Developer  Software Developer |
| Gabriel Gomes | UI/UX Developer |
| John Hamilton | Software Developer  Technical Writer |
| Malachi Jamison | Lead UI/UX Developer  Software Developer |
| Sean Mirani | Lead Software Developer  Business Analyst |
| Zachary Cappella | Lead Technical Writer  Test Engineer |

Table 4 – Stakeholder Roles

The table below will outline each individual role that provides content to the CogniOpen application and all of the people associated to that role.

|  |  |
| --- | --- |
| Role | Team Member(s) |
| Customer | Dr. Mir Assadullah |
| Project Manager | Edward Devine |
| Technical Writer | Zachary Cappella - Lead  Abebe Natea  John Hamilton |
| UI/UX Developer | Malachi Jamison – Lead  Eyerusalme Gebrehiwot  Gabriel Gomes |
| Software Developer | Sean Mirani – Lead  Eyerusalme Gebrehiwot  Malachi Jamison  Alexis Shannon |
| Test Engineer | Abebe Natea – Lead  Zachary Cappella |
| Business Analyst | Edward Devine – Lead  Alexis Shannon  Sean Mirani |

Table 5 – Stakeholder Allocation by Role

# Communication Management

## 9.1 Communication Objectives:

* Ensure clear and consistent between the project stakeholders
* Keep all the team members informed about the project’s progress, changes and updates.
* Provide users with information about the product’s features, updates and benefits
* Address and resolve any communication-related issues.

## 9.2 Communication Channels

The following methods will be utilized for project communication:

* Project Management Platform
* E-mail
* App Notifications
* Teams Meetings
* In-app feedback

## 9.3 Frequency and Timings

* Daily team communication via project management platform
* Weekly team meeting: Held every Tuesday at 6 PM Eastern and Thursday at 8 PM Eastern
* Monthly: Held at first Saturday of the month
* User notifications as needed

## 9.4 Stakeholders

|  |  |  |  |
| --- | --- | --- | --- |
| Stakeholders | Information Needed | Frequency | Methods |
| Project Manager | Progress Reports, Risks, Task assignments, High level project status | Daily | Email, Project management platform, Teams |
| Development Team | Task specifications, Code challenges, bug reports, code reviews | Daily to Weekly | Project management platform, GitHub, Teams |
| Design Team | Design requirements, updates on design iterations, feedback on design choices. | As Needed | Project management platform, Teams, Email |
| QA/ Testing Team | Test plans, test cases, bug reports, issues with app functionality, and testing progress. | As Needed | Project management platform, Teams |
| Marketing Team | App features, updates, user feedback, upcoming campaigns, and user engagement metrics. | Weekly | Project management platform, Teams, Social media platforms |
| Stakeholders | Status Reports | Monthly | Teams |
| Users | App updates, new features, usage tips, feedback mechanisms, and user surveys. | As Needed | App notifications, Feedback forms |

Table 6 – Stakeholder Responsibility by Role

## 9.5 Crisis Communication Plan

* In the event of a crisis, an emergency meeting will be held by the project manager or Team head of the specific department. All the relevant stakeholders will be informed.
* Crisis Scenario: Crisis scenarios that can affect the project or its timeline. Such as:
  + Technical failures
  + Security Breaches
  + Major Delays
  + Negative User Feedback
* Crisis Team:
  + Team Members

## 9.6 Feedback Mechanism

Utilize in-app feedback forms to gather user insights, suggestions, and concerns. Empower users to share their experiences and contribute to app improvement. Regularly review and address feedback to enhance user satisfaction and app functionality

# 10. Risk Management

## 10.1 Risk Analysis:

* Technical Risks
  + Compatibility issues with different devices and operating systems.
  + Performance bottlenecks leading to slow app responsiveness.
  + Bugs or glitches affecting user experience and functionality.
* Operational Risk
  + Shortage of development resources or key team members.
  + Delays are caused by unforeseen external factors, such as changes in regulations.
  + Unplanned server outages or hosting issues affecting app availability.
* Security Risk
  + Data breaches or unauthorized access to user information.
  + Inadequate encryption measures potentially exposing sensitive data.
  + Vulnerabilities in third-party libraries or components.
* User-related risk
  + User confusion due to complex navigation or unclear instructions.
  + Negative user feedback affecting app adoption and reputation.
  + Resistance to using the app among certain user groups.
* External Factors
  + Changes in technology trends impacting app relevancy.
  + Legal or regulatory changes affecting data privacy and compliance.
  + Competitive apps that could divert user attention.

## 10.2 Risk Matrix

Risk matrix provides a visual representation that helps in assessing, prioritizing, and managing risks effectively.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  | **Insignificant** | **Minor** | **Moderate** | **Significant** | **Severe** |
| **Almost Certain** | **Medium #5** | **High #10** | **Very High #15** | **Very High #20** | **Very High #25** |
| **Likely** | **Medium #4** | **Medium #8** | **High #12** | **Very High #16** | **Very High #20** |
| **Possible** | **Low** | **Medium #6** | **Medium # 9** | **High #12** | **Very High #15** |
| **Unlikely** | **Low #2** | **Low** | **Medium #6** | **Medium #8** | **High #10** |
| **Rare** | **Low #1** | **Low #2** | **Low** | **Medium #4** | **Medium #5** |

Table 7 – Risk Matrix Diagram

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Risk ID | Risk Description | Risk Chance | Mitigation Plan | Risk Owner |
| R001 | Data breach due security flaws | High | Implement strong encryption and regular audits | Developer Lead |
| R002 | API request limit getting. | Low | Keeping records for API requests and anytime it reaches the certain threshold increases the plan. | Developer Lead |
| R003 | A Person leaves the team | High | Cross-train team members and have backup plans | Project Manager |
| R004 | AI service downtime | Medium | Identify backup services and set up failovers | Developer Lead |
| R005 | Negative user reviews | High | Implement user feedback loop for rapid improvements | Marketing Lead |
| R006 | App not compliant with regulations | Low | Regularly monitor industry trends and adapt app | Strategy Lead |
| R007 | User confusion in app | Medium | Conduct usability testing and provide clear guides | Design Lead |

Table 8 – Risk Descriptions

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