

Department of Computer Science & Informatics
(BCIS6809)

Milestone

Technical Manual

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NATURAL AND
AGRICULTURAL SCIENCES
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Milestone

BCIS6809 HONOURS PROJECT

Technical Manual

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Chapter 1 - Introduction

1.1 Introduction

Juggling extracurriculars, academics, social commitments, and personal well-being is a formidable task for students. Goals have to be set to maintain a habit of balancing all these tasks. Goals serve as crucial benchmarks, delineating the extent of dedication individuals invest in their endeavours and dictating their performance levels (Schunk, 2003).

The South African government collected data from the dawn of democracy in 1994 to 2019, yielding significant insights. While the surge in student graduations from 58,560 in 1994 to 210,931 in 2017 is noteworthy, merely 22% managed to complete their three-year degree within the stipulated timeframe. By the sixth year, only 56% of students in 2010 had attained their three-year degree (Writer, 2019). These numbers mean that there is a high probability of students not completing their degrees within the allocated timeframe, which tends to be up to three years. A reason for this could be a lack of productivity and focus and getting distracted by ‘the university dream.’ This project aims to fortify student support, nurturing their aspirations and fostering perseverance to facilitate graduation and academic excellence. It endeavours to give students tools for analysing their study habits and streamlining goal-setting processes. Presently, universities underscore time management but fall short in emphasising goal setting as a pivotal aspect (UKZN, 2024). One of the most difficult steps to take when trying to achieve any goal in life is the first step. Where to start (Martin, 2019).

Productivity is not based on the lack of time to work but on the motivation and discipline to improve the work rate. In this sense, short time spent working is greater than long working periods. It is not so much how a person can manage time in certain tasks; it is important to notice the order of the tasks that work best and fit them into a routine (Grant, 2019). Dr. Handy (2018, as cited by Jones, 2019) stated that the brain, over short study sessions, can retain information more effectively than cram it in a few hours (Jones, 2022). These are some of the many important criteria that will be implemented on Milestone.

1.2 Problem statement

Several challenges come with goal setting and productivity for students. These include:

- Overloading of tasks and work.
- Goals do not meet the SMART strategy (Porteous, 2023).
- Poor planning (Porteous, 2023).
- Excuses (Porteous, 2023).
- Fear of failure (Porteous, 2023)
- Lack of task allocation from small to large tasks(generic).
- Negative Influence of social media.
- Decline in motivation and accountability.
- Poor time management.

The primary needs of the students will include being productive in the lifestyle they have made for themselves, having a mindset of the future, and thinking about the goals they want to achieve. This answers the ‘why’ factor in their student journey.

1.3 Scope of the project

I will be implementing the following features that will be expected on the Milestone goal-setting project:

- Set short-term goals
- Set long-term goals
- Add SMART goals
- Screen time reports
- Motivational messages
- Achievement badges
- Daily tasks
- Calendar
- Notebook

The user, being the student, will have access to all these features and get to build their future on Milestone day-by-day. The following features will not be included as part of this project:

- A student team feature with sub-features such as team goals, conversations, activity feed, file sharing,
- Branding
- Different users that are not students
- Subscription

1.4 Project Limitations

The hardware within the university and my personal computer will be sufficient to conduct the completion of the project. My knowledge of technical aspects such as coding and databases and making them interlink with the back and front end is new to me as a BCIS student. This could hinder the software I use to prototype this application. It is only a horizontal prototype, so its limitation is that it is not complete. As a result, it will not be a fully implemented application. There will be no integration with other existing applications, such as integrating the university's Blackboard into Milestone. In addition, there is limited integration, even with the database. If my computer hinders the project's progress in any way, the university has enough hardware for me to work on. The processing of queries will be a cumbersome task, but it will help the application successfully implement and create a prototype.

1.5 Project Schedule

To measure the project's timeline, I have compiled a Gantt chart as shown in Figure 1.1. This Gantt chart will be updated as the project commences. It consists of measures such as the actual start, plan duration, and actual duration of the project. As it stands, it has all the expected planned starts and projected duration.

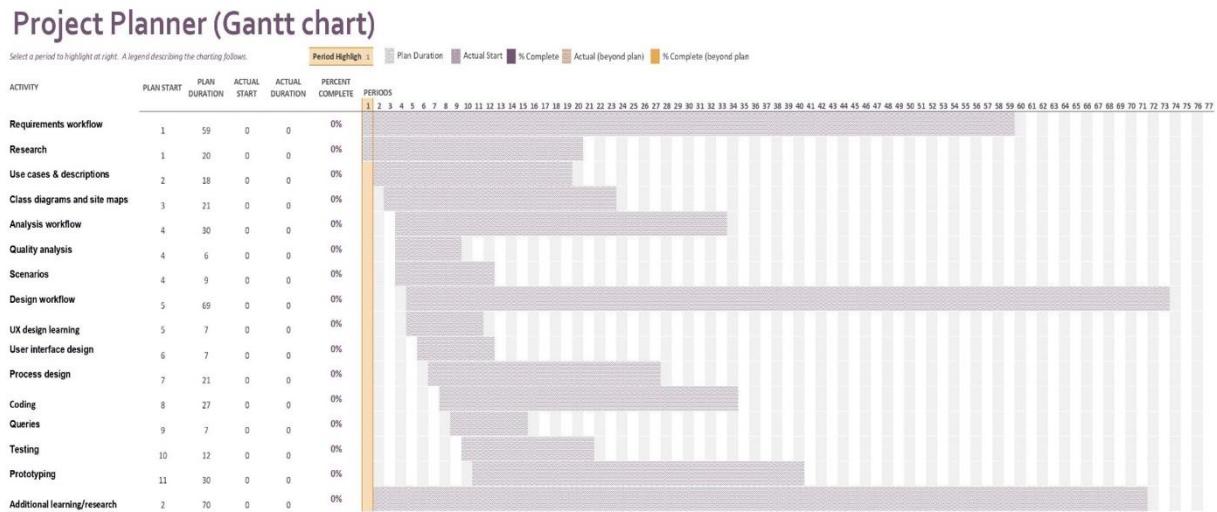


Figure 1.1: Gantt Chart

1.6 Document Overview

The remainder of this technical manual is structured as follows:

- In Chapter 2, an overview of the relevant literature is discussed.
 - In Chapter 3, the requirements and analysis workflow are constructed.
 - In Chapter 4, architectural design is discussed.
 - In Chapter 5, the prototype and source code are discussed.
 - In Chapter 6, the usability of Milestone is evaluated.

Chapter 2 - Literature Review

2.1 Introduction

Goal setting is a concept that has propelled individuals to achieve what they set their minds to. Goal setting and productivity platforms are at the forefront of targeting goals, and this is advantageous in the digital era, where people are constantly glued to their devices. In this literature review, we analyse three prominent goal-setting platforms: Way of Life, Strides, and Lifetick, focusing on some of their features, limitations, and usability for students.

2.2 Existing systems

The proliferation of goal-setting platforms reflects the growing recognition of the importance of goal setting in fostering success and fulfilment in both personal and professional spheres. These platforms encompass a diverse range of tools and methodologies, catering to users' unique needs and preferences across different domains and industries. From web-based applications to mobile apps, these systems offer users a multitude of functionalities, including SMART goal setting, progress tracking, time management tools, and personalised goal categories.

Understanding the landscape of existing goal-setting systems is crucial for individuals seeking to harness the benefits of goal setting in their lives. By critically evaluating the features and capabilities of these platforms, users can make informed decisions regarding selecting and utilising goal-setting tools that best align with their objectives and preferences. Moreover, examining the strengths and limitations of these systems can inform future developments and innovations in the field of goal setting, paving the way for more effective and accessible solutions.

2.2.1 Lifetick

Lifetick (Meridian, 2008) is a comprehensive goal-setting website that provides users with a structured framework for defining, tracking, and achieving their personal and professional objectives. With its intuitive interface and robust features, Lifetick aims to empower individuals to set meaningful goals, develop actionable plans, and stay motivated throughout their journey toward success and fulfilment. Lifetick is an online

goal-setting website that can be broadcast on a laptop or cell phone. It caters to multiple users, such as individuals, school principals, life coaches, small business owners, and HR Managers. Contrary to that, Milestone will cater to students, allowing a more targeted and specific audience to maximise as much out of the platform as possible.

2.2.1.1 Features

The following main features are included in Lifetick:

- **Due dates:** Due dates are a key feature that allows users to plan their tasks carefully with due dates and reminders. This feature is well-known amongst goal-setting platforms. It is advantageous to have this feature as it allows the user to create a plan to have their tasks accomplished in a certain timeframe. Without it, it is impossible to plan. If a task the student must complete in two weeks requires ample time to complete, the student would have to plan out sessions to complete the work instead of finding out days before it is too late.
- **Repeating tasks:** This is another key feature ideal for forming habits of recurring items and repeating tasks.
- **Subtasks:** Lifetick describes this feature to get a user's granularity or structure by breaking tasks into sub-tasks where required. This feature is a good existing feature that allocates tasks in size and longitude.
- **Task assignment on shared goals:** This feature allows users to share tasks, assign them individually, or allow anyone to compete. With a group functionality, it only makes sense that this feature helps the progress of their tasks.
- **Notes:** Notes are important as they provide more context to a task, and Lifetick makes this feature so the user can record notes against a task directly. It is a digital sticky note.
- **Push out or bring forward due dates:** This feature is for moving around dates to reflect achievement time frames more accurately. This feature helps during the update of dates for assignments and work that needs to be done.
- **SMART Goal Setting Principle:** The SMART principle (Locke & Latham, 2002) is a cornerstone for effective goal setting. Each platform incorporates this principle differently. Lifetick provides users with a dedicated tab for setting SMART goals, as depicted in Figure 2.1. This feature ensures that users define

clear and actionable objectives, which is crucial for progress tracking and attainment.

The form is titled "Add goal" and includes a "Guide" button. It consists of six input fields corresponding to the SMART criteria:

- SPECIFIC**: What is my goal?
- MEASURABLE**: How will I know I have achieved this goal?
- ACHIEVABLE**: How realistic is this goal for me?
- RELEVANT**: How does this goal align with my core values?
- TIME SPECIFIC**: When can this goal be achieved? (with a date picker icon)
- Why do you want to achieve this goal? (with a text area)

Below these fields are two additional questions:

- How important is this goal to me right now? (with a dropdown menu)

At the bottom are "Cancel" and "Next" buttons.

[Source : (Meridian, 2008)]

Figure 2.1: SMART goal from Lifetick

2.2.1.2 Limitations

The limitation that is evident in Lifetick is the fee to access certain functions. Not everything on the website will be free to the disposal of all the users they accommodate. It has many features that could confuse the user without receiving the necessary instructions. This shows how less user-friendly it is to novice users.

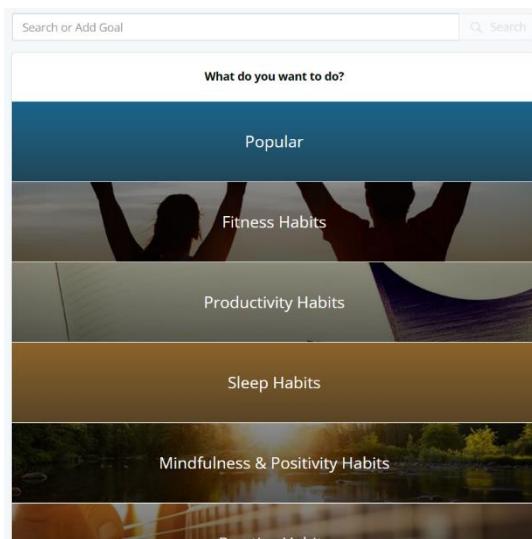
2.2.2 GoalsOnTrack

GoalsOnTrack (Che, 2008) is a goal-setting platform that helps its users turn dreams into reality. It uses the SMART method to guide them in setting clear and achievable goals. It is possible to break down those goals into actionable steps, track progress visually, and build habits that contribute to one's success. GoalsOnTrack offers a well-rounded approach to achieving personal and professional aspirations by incorporating a vision board, goal journaling, and habit tracking.

2.2.2.1 Features

The following features are used in GoalsOnTrack:

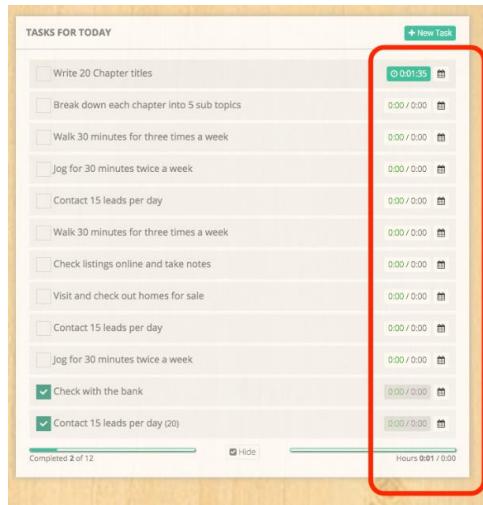
- **Goal Setting Categories:** Diversification of goal categories caters to the multifaceted nature of individuals' aspirations. GoalsOnTrack (see Figure 2.2) offers users various categories, from academic goals to personal development and health objectives. This comprehensive approach ensures users can align their aspirations with their overall life vision, fostering holistic growth and fulfilment.



[Source : (Che, 2008)]

Figure 2.2: GoalsOnTrack goal-setting categories

- **Multi-level goal system:** This feature breaks down large goals into smaller, achievable subgoals. This feature is similar to that of Lifetick (sub-tasks).
- **Vision Board:** The vision board visually represents the user's goal of staying inspired. This feature is important as it motivates users to strive for the result. This feature is crucial to goal setting.
- **Time Tracking:** Effective time management is pivotal for goal attainment, especially for students juggling academic responsibilities with other commitments. The time-tracking feature of GoalsOnTrack (as shown in Figure 2.3) enables users to allocate time efficiently, prioritise tasks, and monitor productivity. Such tools enhance users' ability to stay organised and focused on their objectives.



[Source: (Che, 2008)]

Figure 2.3: Time tracking tasks on GoalsOnTrack

2.2.2.2 Limitations

While GoalsOnTrack boasts a compelling feature set, it is important to acknowledge some potential drawbacks. One limitation is its focus on the individual. Factors like social support and external resources can significantly impact goal achievement, and GoalsOnTrack might not fully address these. Additionally, the platform relies heavily on user input. Unclear goals or inconsistent use can hinder its effectiveness. Data privacy is another consideration, as some users might be wary of a platform collecting goal and habit data. Integration with existing productivity tools could also be limited. Lastly, while GoalsOnTrack offers habit tracking, it might not be as robust as dedicated habit-building apps for those kinds of changes in lifestyle. It is subscription-based, meaning that certain features are not available for free. In conclusion, GoalsOnTrack can be a valuable tool, but it is important to be aware of its limitations to maximize its effectiveness.

2.2.3 Way of Life

Way of Life (Arendt, 2010) is a habit tracker focusing on building habits. It uses a simple system of marking days as "green" (habit completed) or "skipped" (habit not completed). This allows you to track progress on behaviours you want to establish or break, rather than striving for specific milestones. The app also offers features like visualising streaks of completed habits and skipping trends, helping you identify areas for improvement. While it does not have features like traditional goal-setting apps for setting SMART goals or creating action plans, Way of Life makes habit-building a manageable and trackable process.

2.2.3.1 Features

Way of Life consists of certain features that make them a necessity to their productive users. These include:

- **Habit Tracking:** The core function revolves around tracking daily habits. The user would mark each day as "green" if they completed the habit or "skipped" if they did not.
- **Visualizing Progress:** The app displays streaks of completed habits and skipping trends. This visual feedback helps users to identify areas where they are consistent and areas that might need more focus. A progress tracker will be used in Milestone to track how the user performs in setting their goal.
- **Flexible Reminders:** Set reminders for habits with customisable scheduling and personalised messages to keep users on track.
- **Goal Agnostic:** Unlike traditional goal-setting apps, Way of Life does not focus on specific goals or milestones. It allows users to track any habit they want to build or break.
- **Customization:** Choose from various themes to personalize the app's look and feel. This user-friendly feature gives the user a platform to customize their interface, but this will not be necessary for Milestone.

2.2.3.2 Limitations

Overall, Way of Life offers a streamlined approach to building habits by focusing on daily actions and tracking visual progress. It lacks many features like SMART goal setting and action plans but excels in making habit-building a clear and manageable process. This is important when approaching goals, especially as a student. Way of Life is available on mobile devices, and there is no online version.

2.2.4 Comparison of existing systems

After looking at all the existing systems, I see that many of the features that are used in all the systems are important to goal setting. To compare them, the features of the existing systems are tabulated in Table 2.1 in consideration of Milestone.

Table 2.1: Comparison of existing systems

Feature	Lifetick	GoalsOnTrack	Way of Life
Goal Setting	x	x	
Task Management	x		
Short-to-long-term goal planning	x	x	
Calendar	x	x	x
Achievements	x		
Collaboration	x		
Progress Tracking	x	x	x
Notebook/Journal	x	x	
Motivation	x	x	

In sum, this literature review is a foundational exploration into the realm of existing goal-setting systems and technologies, laying the groundwork for a deeper inquiry into their effectiveness, usability, and potential for empowering individuals to pursue and achieve their aspirations in today's dynamic and interconnected world.

2.3 Terminology

A few of the terminologies used in this project are important to take note of to get a better understanding and these include:

Accountability: The responsibility and obligation to answer for one's actions or commitments, often facilitated through mechanisms such as progress reports, check-ins, or peer support.

Achievement badge: A digital badge that will be used to award a student for reaching a certain milestone.

Collaborative Goal Setting: The process of setting and working towards goals in collaboration with others, such as friends, family, or colleagues, to provide support, accountability, and encouragement.

Goal Categories: Different areas or domains of life in which goals can be set, such as health, career, relationships, personal development, finance, etc.

Journaling and Reflection: The practice of recording thoughts, experiences, and insights related to goal setting and progress, often used for self-reflection, learning, and personal growth.

Progress Tracking: The process of monitoring and evaluating one's advancement towards achieving their goals, often through the use of metrics, charts, or milestones.

Reminders and Notifications: Alerts or prompts to remind users of upcoming tasks, deadlines, or commitments related to their goals.

SMART Goals: Specific, Measurable, Achievable, Relevant, Time-bound goals. A framework for setting objectives that are clear, actionable, and realistic.

Time Management: The practice of organising and prioritising tasks and activities to optimise productivity and efficiency in achieving goals.

2.4 Summary

As a way of improving daily habits, Way of Life is a great example for students to look at. This app uses a simple "green" for completion and "skipped" for missed days to track your progress, helping users build routines and break unwanted ones. Lifetick, on the other hand, takes a more philosophical approach to goal setting. It starts with core values to define your "why" and then utilises SMART goal creation and progress tracking to keep you motivated. Finally, GoalsOnTrack offers a comprehensive toolkit for ambitious goal achievement. It incorporates SMART goals, multi-level breakdowns, task management, and progress tracking with motivational features like vision boards and goal journaling. While each platform has its strengths, consider your needs: Way of Life for daily habits, Lifetick for in-depth goal setting, and GoalsOnTrack for tackling complex goals with a multi-faceted approach. I have looked at these features, assessing their strengths and needs, which has given me an idea of the basic features which should be considered for the implementation of Milestone.

Chapter 3 - Requirements and Analysis Workflow

3.1 Introduction

I am going to be performing a requirements and analysis workflow discussing and showing the functionalities that Milestone needs to operate as a system. This will stem from requirements gathering where I collect data from potential users, identify them, and list the functional requirements. Additionally, designing and describing use cases where I conduct scenarios on how the users and the system interact.

3.2 Requirements Gathering

At the start of the requirements-gathering process, I compiled an online self-completion survey on Google Forms (see Appendix A) to gather student feedback on features they would like to see included in an application for goal setting and productivity. The platform I used to distribute the invitation link for the survey was WhatsApp Messenger. From there, all the contacts on my cell phone could see the link, but the instructions on my WhatsApp story stated that it was intended for UFS students to fill out. The link took them to the Google Forms document online. It remained on WhatsApp for 24 hours for the people on my contact list to see and participate in the survey. I specified that completing it would take 4 to 6 minutes, and 18 participants managed to complete it. This number of responses is regarded as sufficient information to determine the main features to be included in the Milestone web application.

The following functionalities are most requested by the potential users:

- Goal setting
- Task Management
- Short- and Long-term planning
- Calendar
- Achievements and badges for progress
- Progress tracking
- Notebook

Based on this feedback and what I learned from the literature, these functionalities will provide a basic outline of what Milestone will use.

3.2.1 Purpose

The main purpose of Milestone is to help university students to achieve their goals. Using Milestones' goal-achieving drive, the functionalities mentioned above, such as creating goals, progress tracking, and short to long-term goal planning, propel students to be diligent in their work and assess how much work they put in on a daily basis. Through requirements gathering, it is much clearer to note the features and aspects of Milestone.

3.2.2 Intended audience

The intended audience is UFS students. There are no other specific requirements for students to use the system.

3.2.3 Functional requirements

Functional requirements are the software capabilities and features of a system. Table 3.1 outlines the main functional requirements for Milestone. Each requirement is also mapped to a relevant use case.

Looking at the functional requirement of Achievements, the badges awarded to the user will be set with the standards as outlined in Table 3.2.

Table 3.1: Functional requirements

No.	Functional Requirement	Use Case
1	The student log in to use the system	Log in
2	The student can sign up to create an account for each email they have.	Register
3	Guide students in setting Specific, Measurable, Achievable, Relevant, and Time-bound goals.	View SMART goals View SMART goal details Create SMART goals Update SMART goals Delete SMART goals Mark SMART goal as complete
4	Enable students to break down their goals into actionable tasks and prioritise tasks.	View tasks Create tasks Update tasks Delete tasks Mark Task as complete
5	Provide students with a visual representation of their goals, tasks, deadlines, and events.	View Calendar
6	Provide students with a space to write down notes, ideas, reflections, or any relevant information related to their goals.	View Notebook Create Note Update Note Delete Note
7	Recognises and rewards users with badges for accomplishing milestones or making progress towards their goals.	View achievements
8	Manage accounts of registered student users.	Manage Users

Table 3.2: Badge requirements

Badge	Requirement
1	Completing a user's first task.
2	Completing the users first goal.
3	Completing 3 tasks and 3 goals in total.
4	Completing 6 tasks and 6 goals in total.
5	Completing 8 tasks in total.
6	Completing 8 goals in total.

3.3 Use Cases and Scenarios

The diagram in Figure 3.1 provides an overview of all the use cases for Milestone, displaying its functionalities.

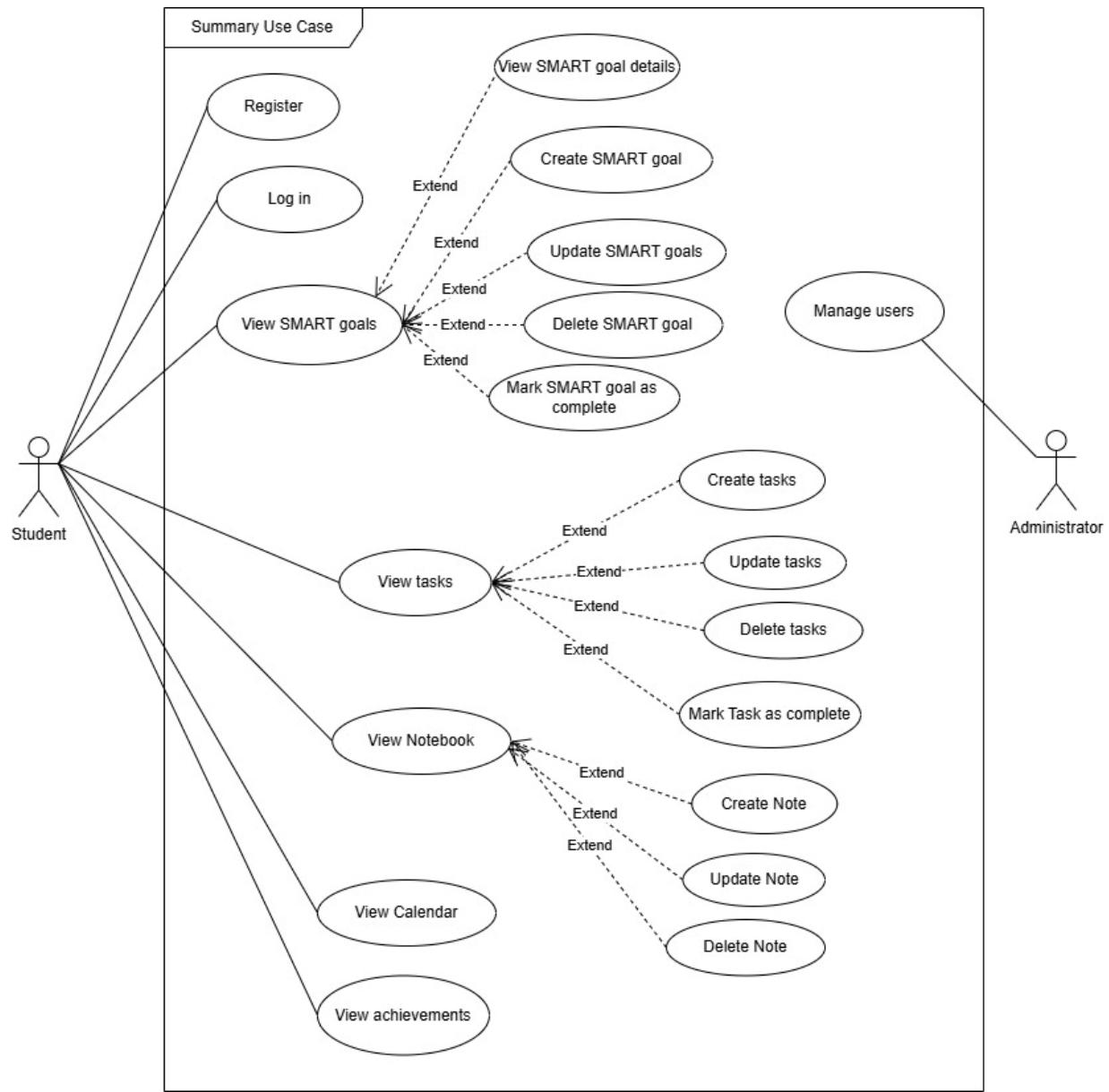


Figure 3.1: Summary use case

In the following sub-sections, I will discuss the elements of the summary use case for every use case and the interaction of the users with the system.

3.3.1 Register Use Case

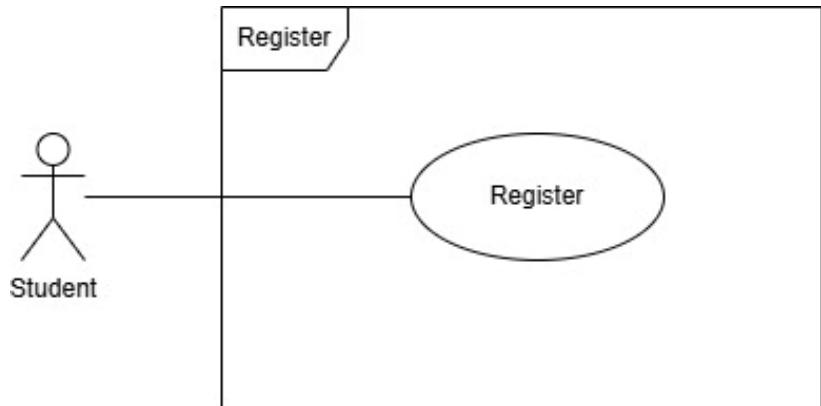


Figure 3.2: Register use case

Brief description: The user, being new to the system, will register an account with Milestone by creating a username and password.

Pre-condition(s):

- The user has opened the web application on their device.

Step-by-step description:

1. The user navigates to the registration page on Milestone.
2. The system requests the user to enter their profile details.
3. The user enters their profile details.
4. The system validates the profile details and creates the user's account.
5. The system informs the user that they have been registered.
6. The user is redirected to the Login section.

Post-condition:

- The user has been registered and can proceed to enter Milestone.

Scenario(s):

1. While viewing the Milestone website, Jamie clicks on the "Register" link.
2. The system displays a blank form, asking the user to enter the following: First name, Last name, Username, password and email address.
3. The user fills in the required information and clicks the button to submit it.
4. The system creates Jamie's account with the entered credentials.

5. The system displays a message informing Jamie that their registration was successful.
6. The system redirects Jamie to the login page, where they can now log in.

3.3.2 Log in

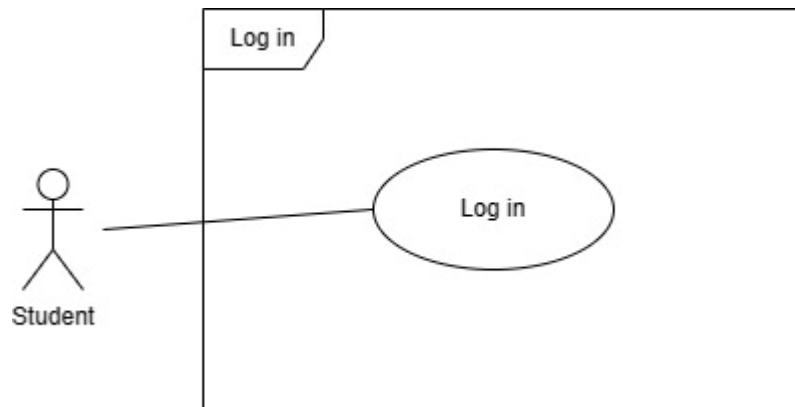


Figure 3.3: Log in use case

Brief description: To get into Milestone, the user enters their username and password, and the system validates the information before the user can be authenticated to access the application.

Pre-condition(s):

- The user has registered an account on the Milestones web application.
- The user is viewing the Milestones application on their device.

Step-by-step description:

1. The user goes to log into Milestone.
2. The system requests for the users' credentials to be filled in.
3. The user enters their login credentials.
4. The system verifies in its database that the information is indeed correct.
5. The system then accepts the user's request to enter Milestone and grants permission.
6. The user is redirected to the Milestone dashboard.

Post-condition:

- The user has been authenticated and can access their data on Milestone.

Scenario(s):

Basic scenario:

1. Jamie selects the Login link on the Milestone home page.
2. The system displays a login form requesting Jamie's username and password.
3. Jamie enters her username "jamie.parker" and her password into the provided fields.
4. The system checks the database and confirms that Jamie's entered username and password match the registered information.
5. The system verifies the credentials and creates a session for Jamie.
6. Jamie is redirected to her personalized Milestone dashboard, where she can view and manage her academic goals and progress.

Incorrect password scenario:

1. Jamie selects the Login link on the Milestone home page.
2. The system displays a login form requesting Jamie's username and password.
3. Jamie enters her username "jamie.parker" and her password into the provided fields.
4. The system checks the database and confirms that Jamie's entered username and password do not match the registered information.
5. The system displays an error message indicating incorrect credentials.
6. Jamie remains on the login page and can attempt to log in again.

Blocked user scenario:

1. Jamie selects the Login link on the Milestone home page.
2. The system displays a login form requesting Jamie's username and password.
3. Jamie enters her username "jamie.parker" and her password into the provided fields.
4. The system checks the database and confirms that Jamie's entered username and password do not match the registered information.
5. The system displays an error message indicating incorrect credentials.
6. The system reaches a total of 3 failed password attempts and blocks the user.
7. The user is notified to contact the administrator to query the dispute.

3.3.3 View SMART goals

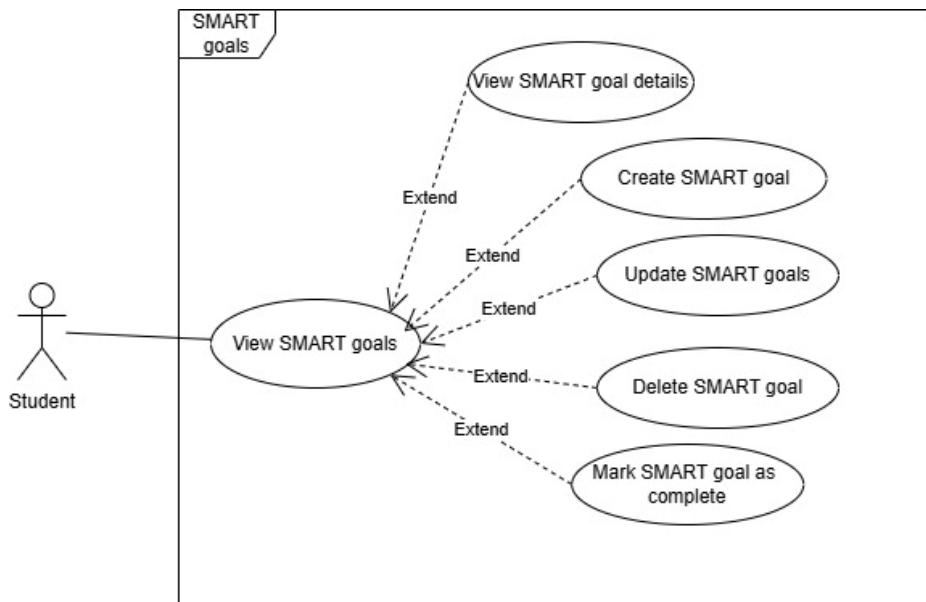


Figure 3.4 : View SMART goal use case

Brief description:

The user views their SMART goals for any goal they set.

Pre-condition(s):

- The user has been authenticated.

Step-by-step description:

1. The user indicates that they want to view their SMART goals.
2. The system retrieves and displays all the user's SMART goals.
3. The user can now choose to do any of the following:
 - a. View more details of a SMART goal:
 - i. The system responds to the request and loads the details for the selected SMART goal.
 - b. Create a new SMART goal:
 - i. The system requests the user to enter all the details of a new SMART goal
 - ii. The user enters the SMART goals conforming to the SMART goal principle.
 - iii. The user submits their goal.

- iv. The system saves the goal.
 - c. Update an existing SMART goal:
 - i. The system displays the current/existing details of the selected goal.
 - ii. The user makes the necessary changes.
 - iii. The user saves the changes.
 - iv. The system updates the goal details.
 - d. Delete a SMART goal:
 - i. The system asks the user to confirm that they want to delete the selected goal.
 - ii. The user confirms that they want to delete the goal.
 - iii. The system deletes the selected goal.
 - e. Mark SMART goal as complete
 - i. The system asks the user to confirm that they have completed it.
 - ii. The user verifies that they want to mark the goal as achieved.
 - iii. The system saves the changes made.
4. The system displays an updated list of SMART goals.

Post-condition:

- The user can see an updated list of their SMART goals.

Scenario(s):

Basic Scenario to view SMART goals:

1. Jamie clicks on the "My SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.

Creating a SMART goal:

1. Jamie clicks on the "My SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie clicks on the "Create" button to create a new goal.
4. The system displays a blank form, asking her to enter the following:
 - a. What specific goal do you want to achieve?

- b. How will you track your progress towards this goal?
 - c. Is this goal realistic and attainable for you?
 - d. How does this goal align with your long-term objectives?
 - e. When do you want to achieve this goal by?
5. Jamie fills in the form.
 6. Jamie clicks the "Submit" button.
 7. The system saves Jamie's new SMART goal in the database.
 8. The system displays an updated list of Jamie's SMART goals.

Failed attempt at creating goal:

1. Jamie clicks on the "My SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie clicks on the "Create" button to create a new goal.
4. The system displays a blank form, and she fills the information.
5. Jamie fills in the form.
6. Jamie clicks the "Submit" button.
7. The system fails to save the goal.
8. The system reloads.

Update an existing SMART goal:

1. Jamie clicks on the "My SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie selects an existing SMART goal she wants to update.
4. The system displays the current details of this goal.
5. Jamie edits the details of the goal, updating the first answer to the question on the specific goal and the final question on the deadline to achieving the goal.
6. Jamie clicks the "Submit" button.
7. The system updates the goal with the new details in the database.

Alternative Scenario (to update an existing SMART goal):

1. Jamie clicks on the "My SMART Goals" button/link on her dashboard.

2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie selects an existing SMART goal she wants to update.
4. The system displays the current details of this goal.
5. Jamie decides not to update the goal and there is an error.
6. The system discards any unsaved changes and returns Jamie to the previous page.

Delete a SMART goal:

1. Jamie clicks on the "My SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie clicks on the "Delete" button next to a SMART goal she wants to remove.
4. A confirmation dialog appears, and Jamie confirms her decision.
5. The system removes the selected goal from the database.

Alternative Scenario (to delete a SMART goal):

1. Jamie clicks on the "View SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie clicks or ticks) on the "Delete" button next to a SMART goal she wants to remove.
4. A confirmation dialog appears, asking Jamie to confirm her decision.
5. Jamie decides not to delete the goal and cancels the action.
6. The system retains the SMART goal in the database.

Mark SMART goal as achieved:

1. Jamie clicks on the "View SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie clicks (or ticks) on the "Mark as Achieved" button next to a SMART goal she has finished.
4. A confirmation dialog appears, asking Jamie to verify the completion.

5. Jamie confirms her decision.
6. The system updates the goal status to "Achieved" in the database.

Alternative scenario (to Mark SMART goal as achieved):

1. Jamie clicks on the "View SMART Goals" button/link on her dashboard.
2. The system fetches Jamie's SMART goals from the database and displays them in a list format on her screen.
3. Jamie clicks (or ticks) on the "Mark as achieved" button next to a SMART goal she has finished.
4. A confirmation dialog appears, asking Jamie to verify the completion.
5. Jamie decides not to mark the goal as complete and cancels the action.
6. The system retains the current status of the SMART goal in the database.
7. If the goal is not marked as complete and goes past its deadline, it is considered an unachieved goal.

3.3.4 View tasks

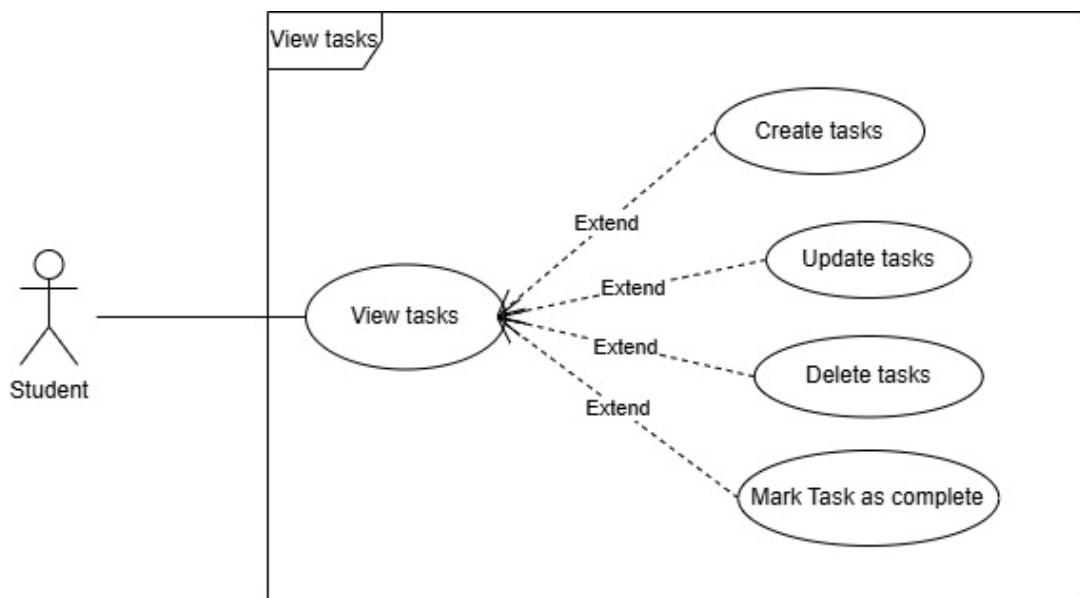


Figure 3.5: View tasks use case

Brief description:

The student completes and manages their tasks for the work they plan to do.

Pre-condition(s):

- The user has been authenticated.

- The user is viewing their Milestone dashboard.

Step-by-step description:

1. The user indicates that they want to view their tasks.
2. The system retrieves and displays all the user's tasks.
3. The user can now choose to do any of the following:
 - a. Create a new task
 - i. The system requests the user to enter a task.
 - ii. The user enters the task.
 - iii. The user submits their task.
 - iv. The system saves the task.
 - b. Update existing task
 - i. The system displays the current/existing details of the selected task.
 - ii. The user makes the necessary changes.
 - iii. The user saves the changes.
 - iv. The system updates the tasks.
 - c. Delete a task
 - i. The system asks the user to confirm that they want to delete the selected task.
 - ii. The user confirms that they want to delete the task.
 - iii. The system deletes the selected task.
 - d. Mark task as complete
 - i. The user marks the task as complete.
 - ii. The system asks the user to confirm that they have completed it.
 - iii. The user verifies that they want to mark the task as complete.
 - iv. The system saves the changes made.
4. The system displays an updated list of tasks

Post-condition:

- An updated list of the users' tasks is displayed.

Scenarios:

Basic Scenario to view task:

1. Jamie clicks the "My Tasks" button/link on her dashboard to view.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.

Creating a new task:

1. Jamie clicks the "My Tasks" button/link on her dashboard to view.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. Jamie clicks on the "Create" button to create a new task.
4. Jamie types in the details of her new task.
5. Jamie clicks the "Submit" button.
6. The system saves the new task in the database.

Alternative scenario(Create a new task):

1. Jamie clicks the "My Tasks" button/link on her dashboard.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. Jamie clicks on the "Create" button to create a new task.
4. Jamie enters the task but decides not to submit it.
5. Jamie cancels the task creation.
6. The system does not save the task and returns Jamie to the previous screen.

Update a new task:

1. Jamie clicks the "My Tasks" button/link on her dashboard.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. Jamie selects a task she wants to update.
4. Jamie edits the details of the task.
5. Jamie saves the changes.
6. The system saves the updated task details in the database.

Alternative scenario(Update a new task):

1. Jamie clicks the "My Tasks" button/link on her dashboard.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. Jamie selects a task she wants to update.
4. Jamie decides not to update the task and cancels the action by clicking the "Cancel" button.
5. The system does not save any changes and retains the original task details.

Delete a task:

1. Jamie clicks the "My Tasks" button/link on her dashboard.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. The system asks Jamie to confirm that she wants to delete the selected task using a confirmation dialog.
4. Jamie clicks "Yes" or "Confirm" in the confirmation dialog.
5. The system removes the selected task from the database.

Alternative scenario>Delete a task):

1. Jamie clicks the "My Tasks" button/link on her dashboard.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. The system asks Jamie to confirm that she wants to delete the selected task using a confirmation dialog.
4. Jamie clicks "No" or "Cancel" in the confirmation dialog.
5. The system does not delete the task and returns Jamie to the list of tasks.

Mark a task:

1. Jamie clicks the "My Tasks" button/link on her dashboard.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. Jamie clicks (or ticks) on the "Mark as Complete" button next to a task she has finished.
4. A confirmation dialog appears, asking Jamie to verify the completion.

5. Jamie confirms her decision.
6. The system updates the task status to "Complete" in the database.
7. The system records every goal that is marked as complete using a count to keep track of potential badges

Alternative scenario(Mark a task):

1. Jamie clicks the "My Tasks" button/link on her dashboard.
2. The system fetches Jamie's tasks from the database and displays them in a list format on her screen.
3. Jamie clicks (or ticks) on the "Mark as Complete" button next to a task she has finished.
4. A confirmation dialog appears, asking Jamie to verify the completion.
5. Jamie decides not to mark the goal as complete and cancels the action.
6. The system retains the current status of the task in the database.

3.3.5 View Calendar

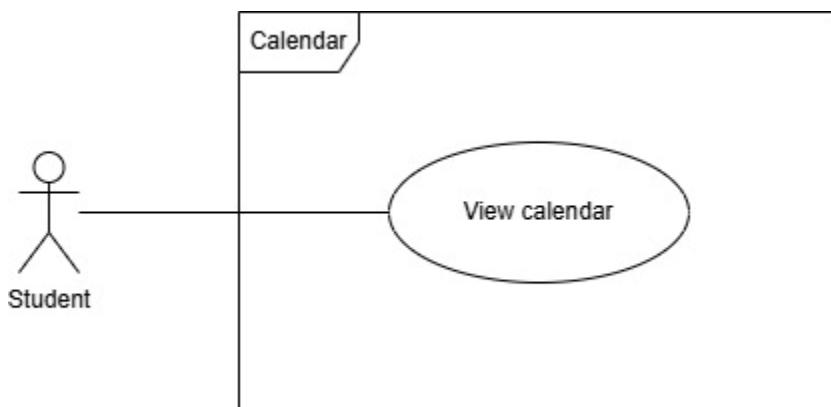


Figure 3.6: View Calendar use case

Brief description:

Users can access the calendar to view their tasks and goals for the day, week or month.

Pre-condition(s):

- The user has been authenticated.
- The user is viewing their Milestone dashboard.

Step-by-step description:

1. The user chooses to view the calendar.
2. The system responds by displaying the calendar.
3. The system generates and displays the user's calendar for today.

Post-condition:

The user has viewed the calendar according today, week, month as well as what they can do within the dates.

Scenarios:

1. Jamie clicks on the “Calendar” tab or button in the Milestone web application.
2. The system loads the calendar interface.
3. The system displays the calendar.
4. The system retrieves Jamie's tasks and goals scheduled for today from the database.
5. The tasks that are completed are not displayed on the calendar, the tasks and goals are colour coded.

3.3.6 View Notebook

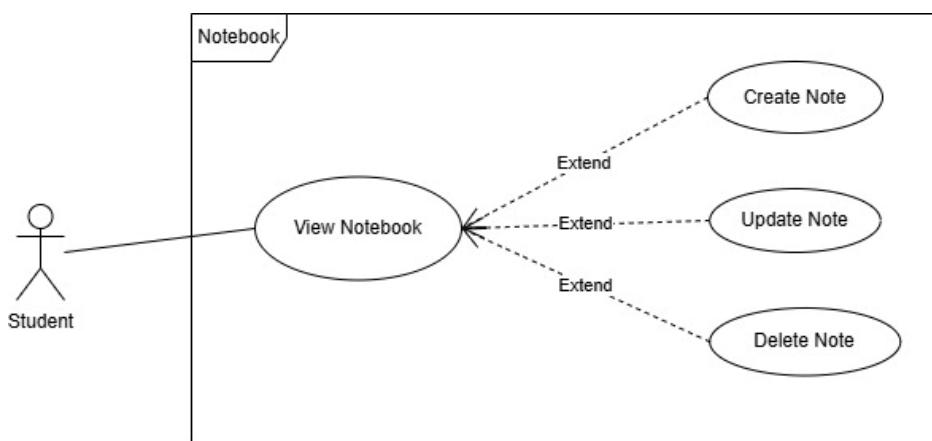


Figure 3.7: View Notebook use case

Brief description:

- The user must be an authenticated user and have access to Milestone.
- The user can access their notebook and write down information.

Pre-condition(s):

- The user has been authenticated.
- The user is viewing their Milestone dashboard.

Step-by-step description:

1. The user wants to add notes to the notebook for safekeeping.
2. The system opens the user's notebook.
3. The system retrieves and displays all the user's notebooks.
4. The user can now choose to do any of the following:
 - a. Create a new note
 - i. The system requests the user to enter a note.
 - ii. The user enters the note.
 - iii. The user saves their note.
 - iv. The system saves the Note.
 - b. Update existing note
 - i. The system displays the current/existing details of the selected note.
 - ii. The user makes the necessary changes.
 - iii. The user saves the changes.
 - iv. The system updates the notebook.
 - c. Delete a note
 - i. The system asks the user to confirm that they want to delete the selected note.
 - ii. The user confirms that they want to delete the note.
 - iii. The system deletes the selected note.

Post-condition:

The users' notes are stored on Milestone and retained when the user needs them.

Scenarios:*Basic Scenario to view a note:*

1. Jamie clicks her dashboard's "View Note" button/link.
2. The system fetches Jamie's Note from the database and displays them on her screen.

Creating a new note:

1. Jamie clicks the "My Note" button/link on her dashboard.
2. The system fetches Jamie's Note from the database and displays them on her screen.
3. Jamie clicks on the "Create New Note" button.
4. Jamie types in the details of her new Note.
5. Jamie clicks the "Save" button.
6. The system saves the new Note in the database.

Create note failure:

1. Jamie clicks the "My Note" button/link on her dashboard.
2. The system fetches Jamie's Note from the database and displays them on her screen.
3. Jamie clicks on the "Create New Note" button.
4. Jamie types in the details of her new Note.
5. Jamie clicks the "Save" button.
6. The system fails to create a new note.
7. Jamie returns to the Notebook.

Update a new Note:

7. Jamie clicks the "My Note" button/link on her dashboard.
8. The system fetches Jamie's Note from the database and displays them in a list format on her screen.
9. Jamie selects a Note she wants to update.
10. Jamie edits the details of the Note.
11. Jamie saves the changes.
12. The system saves the updated Note details in the database.

Alternative scenario(Update a new Note):

6. Jamie clicks the "View Note" button/link on her dashboard.
7. The system fetches Jamie's Note from the database and displays them in a list format on her screen.
8. Jamie selects a Note she wants to update.
9. Jamie decides not to update the Note and cancels the action by clicking the "Cancel" button.

10. The system does not save any changes and retains the original Note details.

Delete a Note:

6. Jamie clicks the "View Note" button/link on her dashboard.
7. The system fetches Jamie's Note from the database and displays them in a list format on her screen.
8. The system asks Jamie to confirm that she wants to delete the selected Note using a confirmation dialog.
9. Jamie clicks "Yes" or "Confirm" in the confirmation dialog.
10. The system removes the selected Note from the database.

Alternative scenario(Delete a Note):

6. Jamie clicks the "View Note" button/link on her dashboard.
7. The system fetches Jamie's Note from the database and displays them in a list format on her screen.
8. The system asks Jamie to confirm that she wants to delete the selected Note using a confirmation dialog.
9. Jamie clicks "No" or "Cancel" in the confirmation dialog.
10. The system does not delete the Note and returns Jamie to the list of Note.

3.3.7 View Achievements

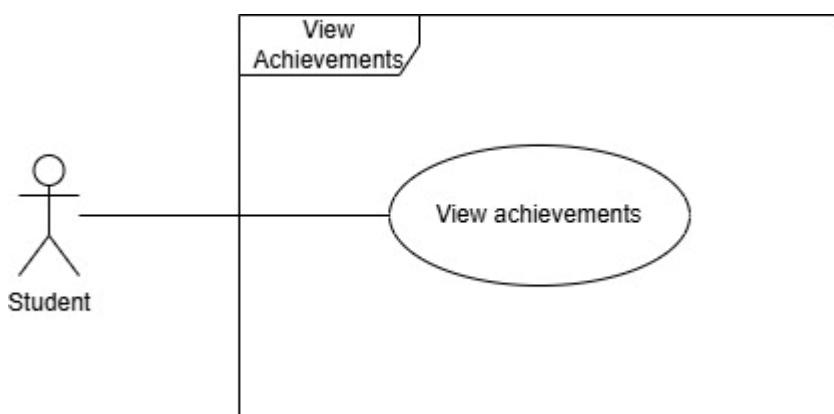


Figure 3.8: View Achievements use case

Brief description:

- The user must be an authenticated user and have access to the dashboard.
- The user is rewarded with badges and awards for their progress using Milestone.

Pre-condition(s):

- The user has been authenticated.
- The user is viewing their Milestone dashboard.
- The user must have set goals for which they are pursuing and making progress.

Step-by-step description:

1. The user selects to view their achievements.
2. The system has a ladder of potential achievements and displays:
 - a. the user's progress toward achieving a badge.
 - b. the user's current badges and progress.

Post-condition:

The user can view the achievements on Milestone and look to complete and achieve them.

Scenarios:

1. Jamie clicks on the "Achievements" tab or button in the Milestone web application.
2. The system retrieves and displays Jamie's progress toward various badges, showing how close she is to earning each one by counting the amount of completed goals and tasks marked by Jamie.
3. The system also displays the badges and achievements Jamie has already earned, along with the progress details for each.

3.3.8 Manage Users

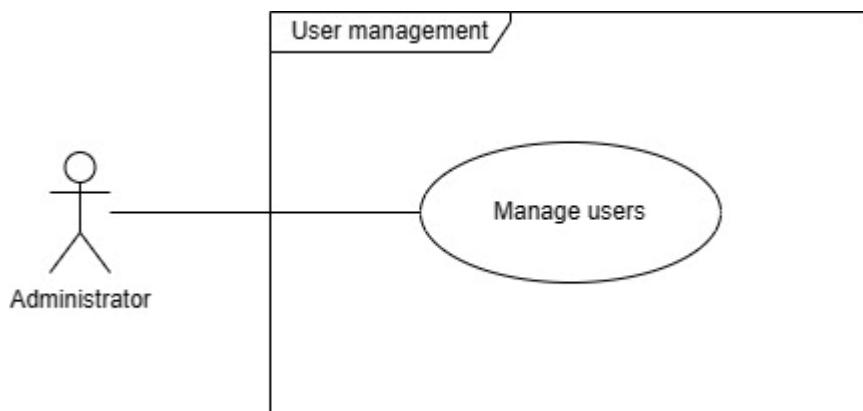


Figure 3.9: Manage users' use case

Brief description:

- The user must be an authenticated user and have access to Milestone.
- The administrator can unblock a user out of Milestone.

Pre-condition(s):

- The user is authenticated.
- The user belongs to the Administrator role.

Step-by-step description:

1. The system has a list of users that have incorrectly entered their passwords 3 times.
2. The user is blocked.
3. The system displays the users on the administrator's dashboard.
4. The administrator can unblock the user.

Post-condition:

The administrator has managed to unblock a user.

Scenarios:

1. Josh navigates to the user management section, where he sees a list of usernames that are blocked.
2. Josh receives a notification from a user to request to be unblocked.
3. With the appropriate reasons, Josh approves and unblocks the user.

4. The user is able to log in again.

3.4 Summary

To conclude, I designed use case diagrams that aligned with Milestone's overall use case, explaining the pre- and post-conditions, providing a description and coming up with scenarios to make it sound more practical. I also noted the functional requirements that will be used, along with a table format of the achievement requirements for which the user can be rewarded.

Chapter 4 - Architecture Design

4.1 Introduction

Throughout the architecture design process, I will design a sitemap of the Milestone web application displaying how it is expected to operate and flow. To add, I will design an ER diagram that focuses on tables, primary keys, relationships, attributes, fields and referential integrity.

4.2 Site map

This site map for Milestone (see Figure 4.1) is shaped in a tree structure to display how the system flows from one page of Milestone to another.

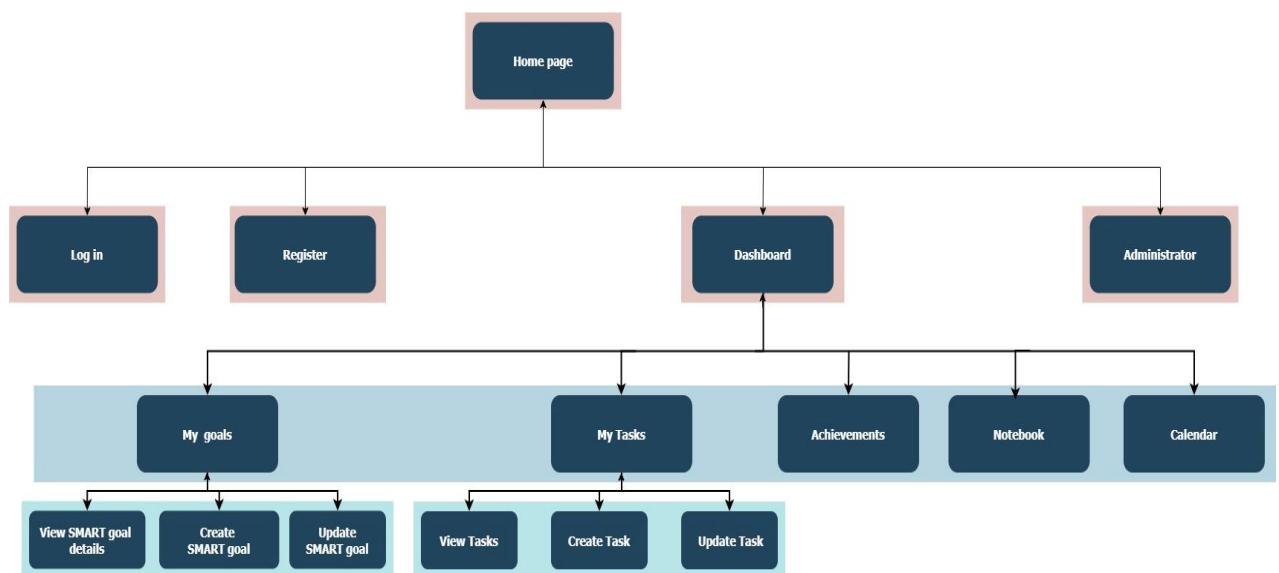


Figure 4.1: Site Map

4.3 Entity-Relationship diagram

The Entity-relationship diagram in Figure 4.2 showcases the tables, attributes, and relationships that will be used to create the database for Milestone.

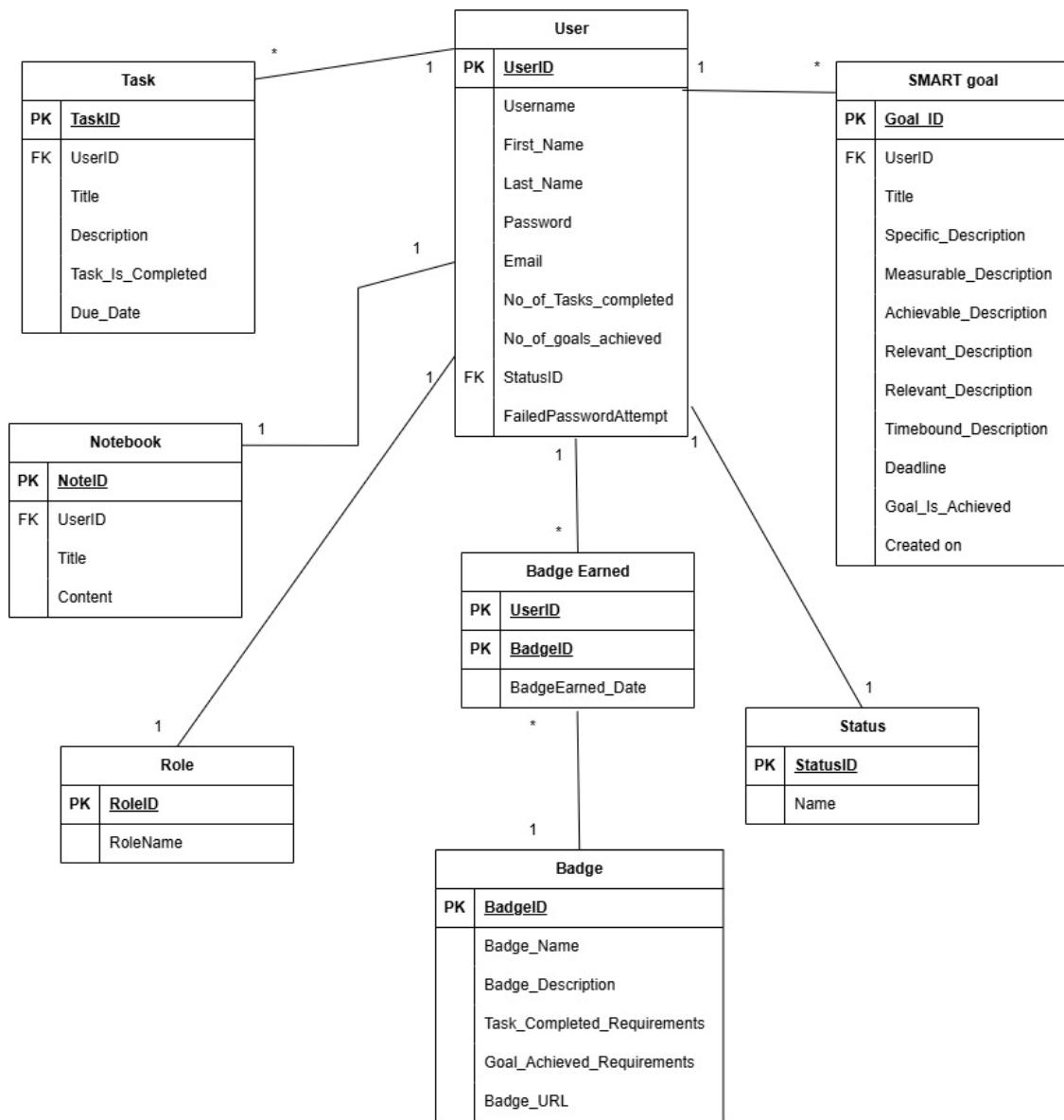


Figure 4.2: Entity-Relationship Diagram

Eight tables will be used to define the data types and keys that define the data from the ER diagram.

The User table (see Table 4.1) will be used to store basic information about registered users as well as information regarding the number of tasks and goals they have completed. There will also be a property to track the number of failed password entry attempts.

Table 4.1: User table

Column Name	Data Type	Key
UserID	INT	Primary Key
Username	VARCHAR	
First_Name	VARCHAR	
Last_Name	VARCHAR	
Password	VARCHAR	
Email	VARCHAR	
No_of_Tasks_completed	INT	
No_of_goals_achieved	INT	
StatusID	INT	Foreign Key
FailedPasswordAttempt	INT	

Task table (see Table 4.2) records tasks assigned to or created by users. Each task is uniquely identified by TaskID (Primary Key) and is associated with a specific user through the UserID (Foreign Key). The table includes details about the task, such as Title, Description, and whether the task is completed (Task_Is_Completed). It also includes a Due_Date to track the deadline for the task.

Table 4.2: Task table

Column Name	Data Type	Key
TaskID	INT	Primary Key
UserID	INT	Foreign Key
Title	VARCHAR	
Description	TEXT	
Task_Is_Completed	BOOLEAN	
Due_Date	DATE	

The SMART Goal (see Table 4.3) stores information about specific goals set by users, each identified by a unique Goal_ID (Primary Key). The UserID (Foreign Key) links each goal to the user who set it. The table follows the SMART criteria (Specific, Measurable, Achievable, Relevant, and Timebound), storing detailed descriptions for each aspect. It also tracks the Deadline, whether the goal is achieved (Goal_Is_Achieved), and the date the goal was created (Created_on).

Table 4.3: SMART goal table

Column Name	Data Type	Key
Goal_ID	INT	Primary Key
UserID	INT	Foreign Key
Title	VARCHAR	
Specific_Description	TEXT	
Measurable_Description	TEXT	
Achievable_Description	TEXT	
Relevant_Description	TEXT	
Timebound_Description	TEXT	
Deadline	DATE	
Goal_Is_Achieved	BOOLEAN	
Created_on	DATE	

The Notebook table (see Table 4.4) captures notes taken by users, with each note uniquely identified by NoteID (Primary Key). The UserID (Foreign Key) associates each note with the user who created it. The table also includes a Title and the Content of the note, allowing users to document their thoughts, plans, or other relevant information.

Table 4.4: Notebook table

Column Name	Data Type	Key
NoteID	INT	Primary Key
UserID	INT	Foreign Key
Title	VARCHAR	
Content	TEXT	

The Role table (see Table 4.5) defines different roles within the system, with each role uniquely identified by RoleID (Primary Key). The table stores the RoleName, which describes the type of role (e.g., admin, user) that can be assigned to users. This structure helps manage permissions and access levels within the system.

Table 4.5: Role table

Column Name	Data Type	Key
RoleID	INT	Primary Key
RoleName	TEXT	

The Status table (see Table 4.6) maintains various statuses that can be assigned to users, identified by StatusID (Primary Key). Each status is described by the Name field. This table helps in tracking and managing the current state or condition of users, such as blocked users.

Table 4.6: Status table

Column Name	Data Type	Key
StatusID	INT	Primary Key
Name	TEXT	

The Badge table (see Table 4.6) records information about badges that users can earn, identified by BadgeID (Primary Key). It includes fields like Badge_Name, Badge_Description, and the specific Task_Completed_Requirements and Goal_Achieved_Requirements necessary to earn the badge. The Badge_URL stores the location of the badge image or icon. This table supports the system's gamification by tracking achievements.

Table 4.7: Badge table

Column Name	Data Type	Key
BadgeID	INT	Primary Key
Badge_Name	VARCHAR	
Badge_Description	TEXT	
Task_Completed_Requirements	TEXT	
Goal_Achieved_Requirements	TEXT	
Badge_URL	VARCHAR	

The Badge Earned table (see Table 4.8) tracks which badges have been earned by which users, using a composite key made up of UserID and BadgeID (both Primary Keys and Foreign Keys). The BadgeEarned_Date field records the date when the badge was earned. This table serves as a junction between users and badges, documenting achievements and rewarding progress within the system.

Table 4.8: Badge Earned table

Column Name	Data Type	Key
UserID	INT	Primary Key, Foreign Key
BadgeID	INT	Primary Key, Foreign Key
BadgeEarned_Date	DATE	

4.4 Class diagram

The class diagram (see Figure 4.3) represents the types of classes that will be used to design Milestones database.

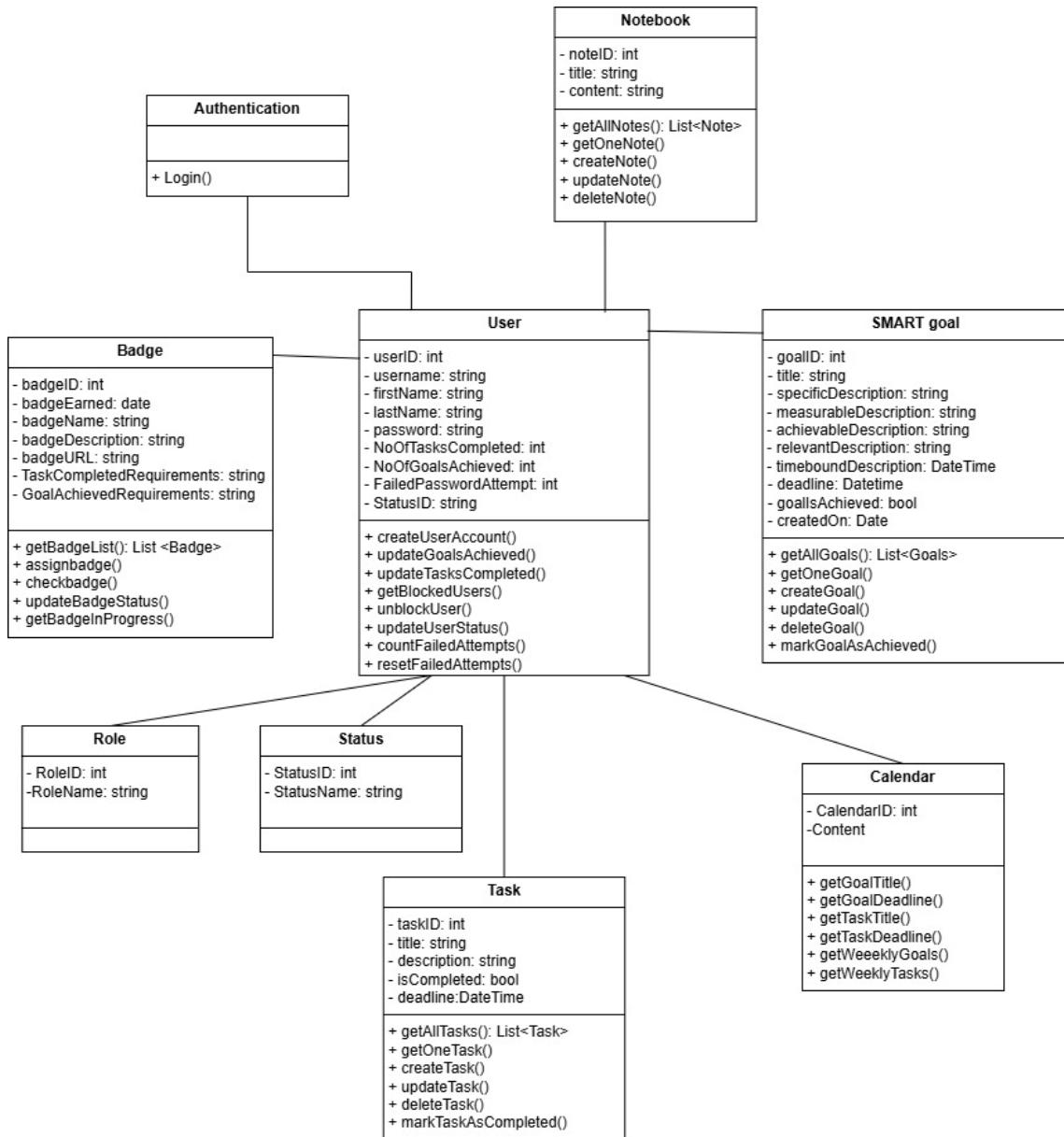


Figure 4.3: Class Diagram

4.5 Sequence diagrams

I will be designing the sequence diagrams for the use cases from Chapter 3, explaining how the user-to-system interaction will proceed for the functional requirements for Milestone. This will help determine how the system will flow on the wireframe. These will all be followed by a diagram to display the sequence.

4.5.1 Log in

The Login sequence diagram (see Figure 4.4) allows a registered user to access the Milestone application by providing their username and password. The system validates the credentials and grants access to the user's personalised dashboard.

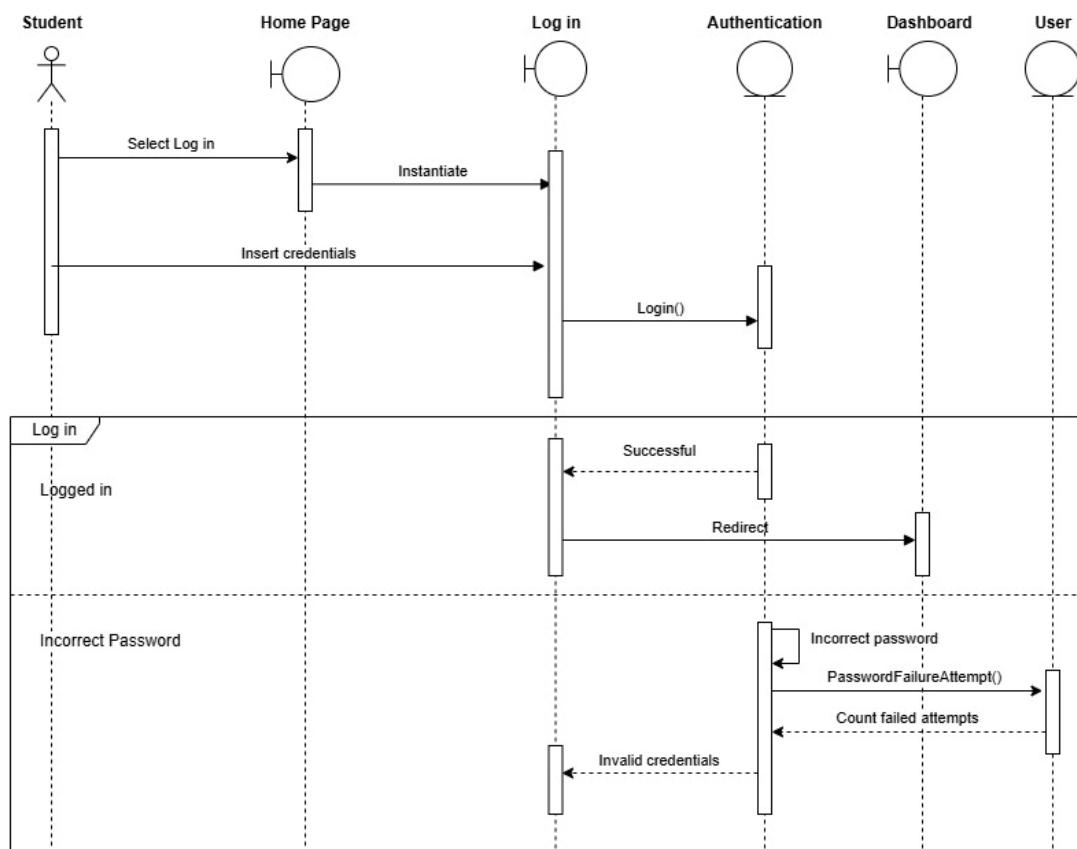


Figure 4.4: Log in sequence diagram

4.5.2 Registration

The Register sequence diagram (see Figure 4.5) enables a new user to create an account in the Milestone application by providing a unique username and password.

The system validates the provided information, creates the user account, and redirects the user to the login page.

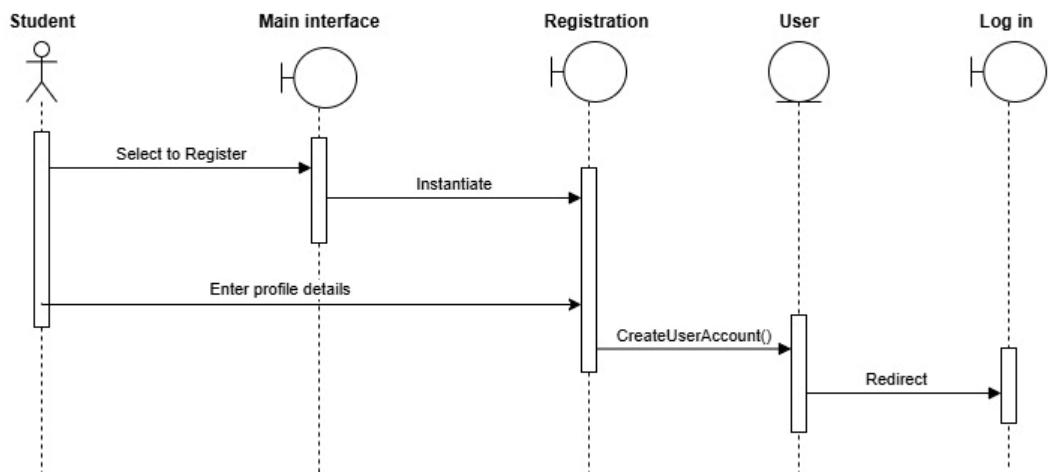


Figure 4.5: Registration sequence diagram

4.5.3 Dashboard

The dashboard will be designed in a manner that the tasks and goals for the week on the calendar are reflected on the dashboard to show the students what they should aim to achieve. To add, the achievement on the horizon(see Figure 4.6).

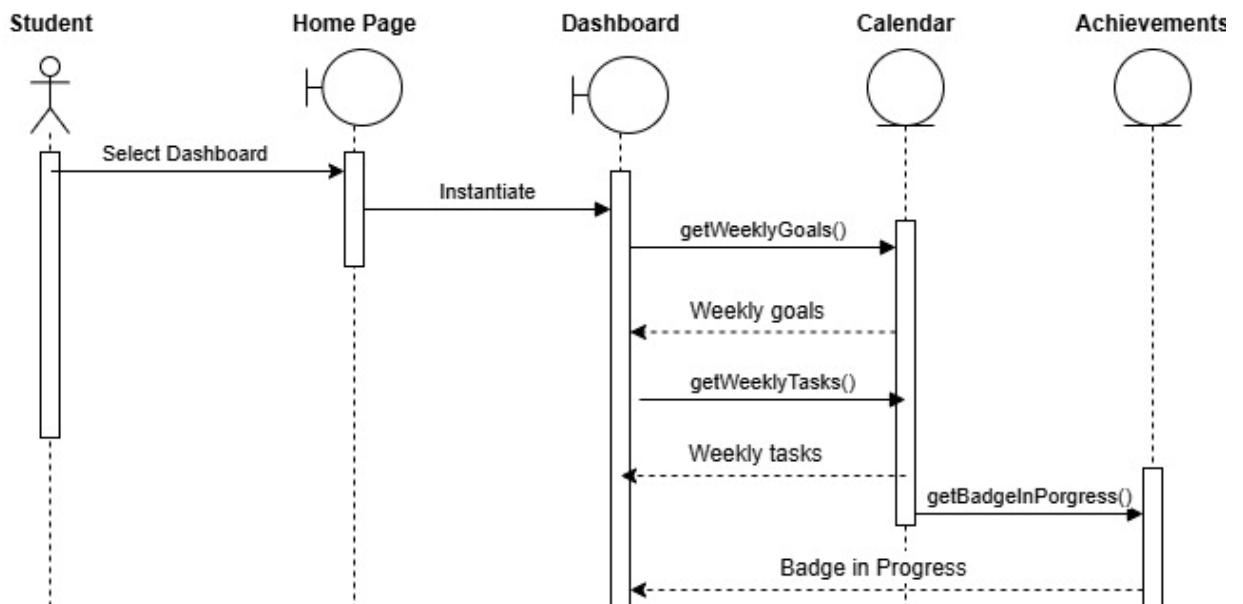


Figure 4.6: Dashboard sequence diagram

4.5.4 View SMART goals details

The View SMART Goal sequence diagram(see Figure 4.7) illustrates the interactions between the user and the system when viewing existing goals.

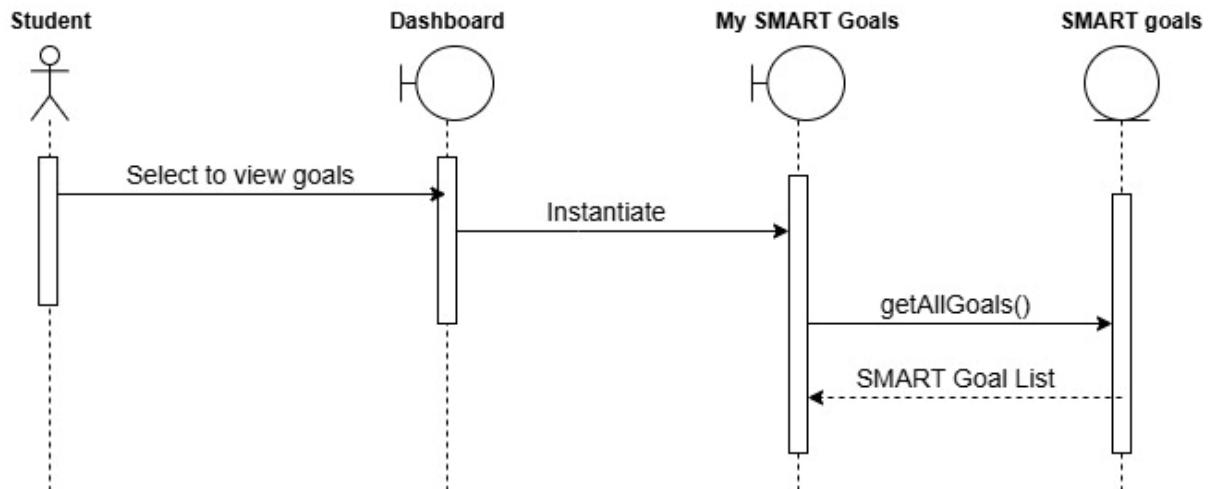


Figure 4.7: View SMART goal details sequence diagram

4.5.5 Create a SMART goal

This diagram of creating SMART GOALS (see Figure 4.8) details the process of entering goal details(criteria), saving them, and retrieving a list of all goals for the user to track their progress.

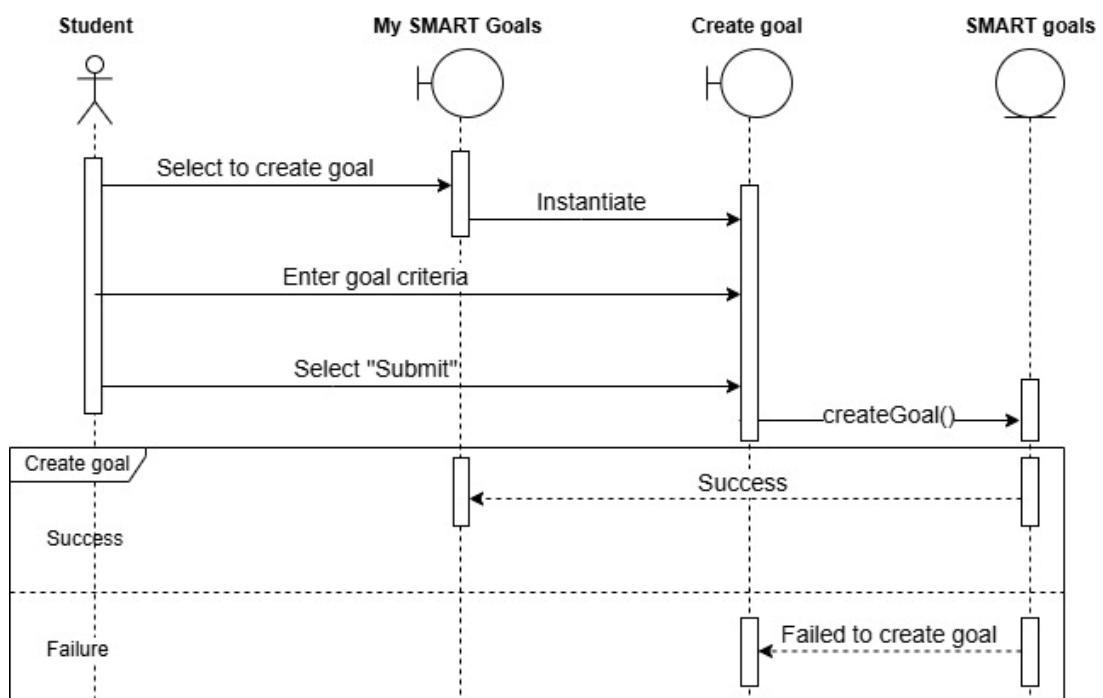


Figure 4.8: Create a SMART goal sequence diagram

4.5.6 Update SMART goal

The Update SMART Goal sequence diagram (see Figure 4.9) depicts the steps involved when a user wants to update an existing SMART goal. It includes the user selecting a goal, editing its details, saving the changes, the system updating the goal's information in the database, and the alternative.

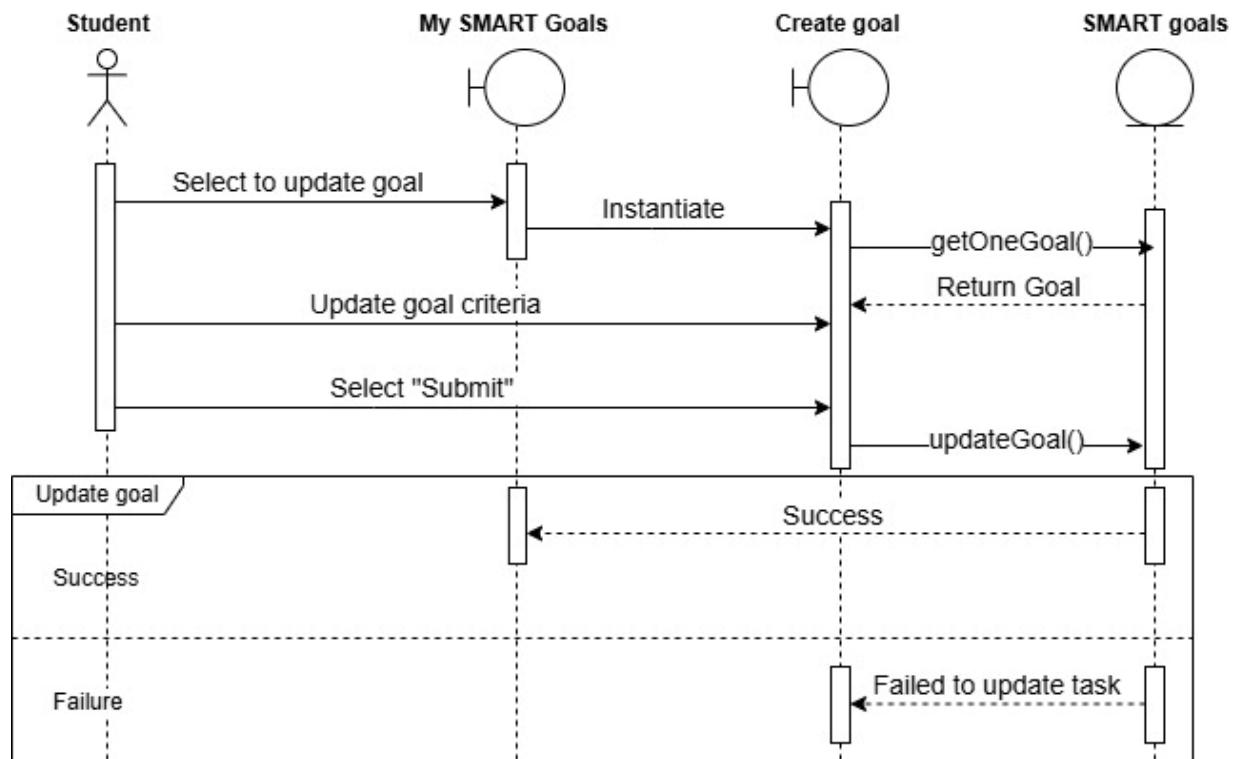


Figure 4.9: Update SMART goal sequence diagram

4.5.7 Delete SMART goal

The Delete SMART Goal sequence diagram (see Figure 4.10) demonstrates the interactions required for a user to delete an existing SMART goal. The diagram shows the user selecting a goal for deletion, confirming the deletion, and the system removing the goal from the database along with the alternative.

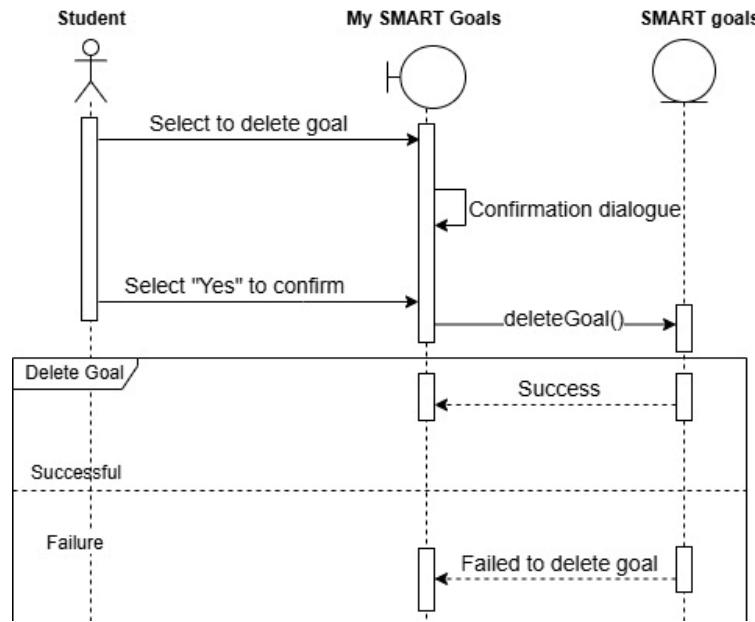


Figure 4.10: Delete SMART goal sequence diagram

4.5.1 Mark SMART goal as complete

The Mark SMART Goal as Complete sequence diagram (see Figure 4.11) outlines the process for marking a SMART goal as completed. The diagram details the interactions where the user marks the goal as complete, confirms the action, and the system updates the goal's status to "Complete" in the database.

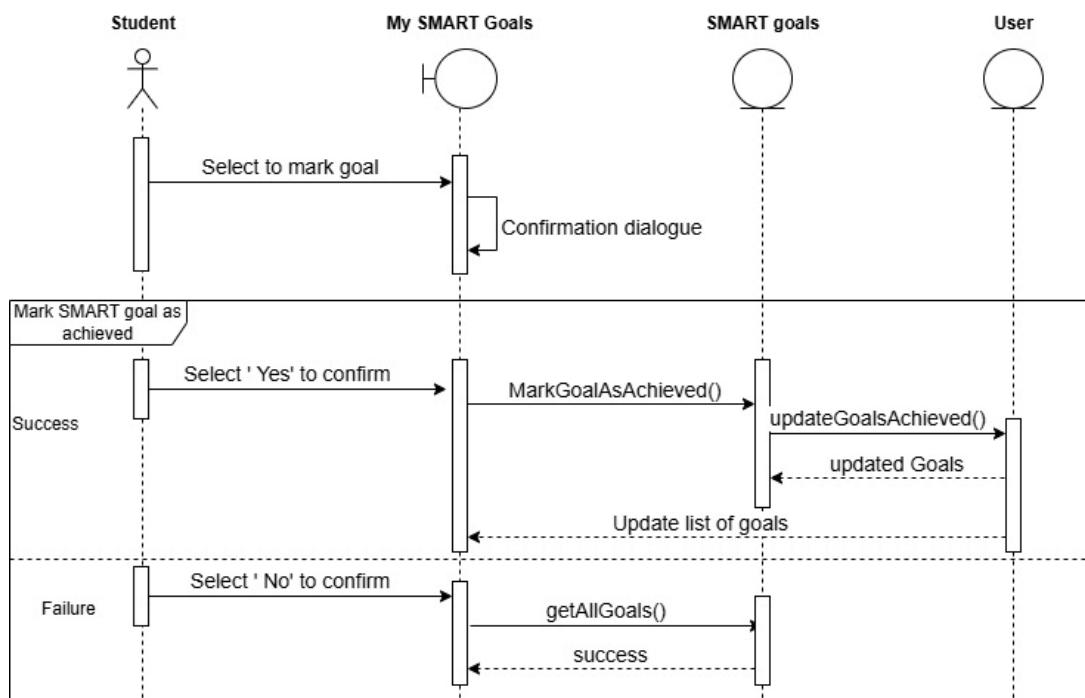


Figure 4.11: Mark Goal as Achieved sequence diagram

4.5.2 View task

The view task sequence diagram (see Figure 4.12) displays how the user can access the tasks that have been created.

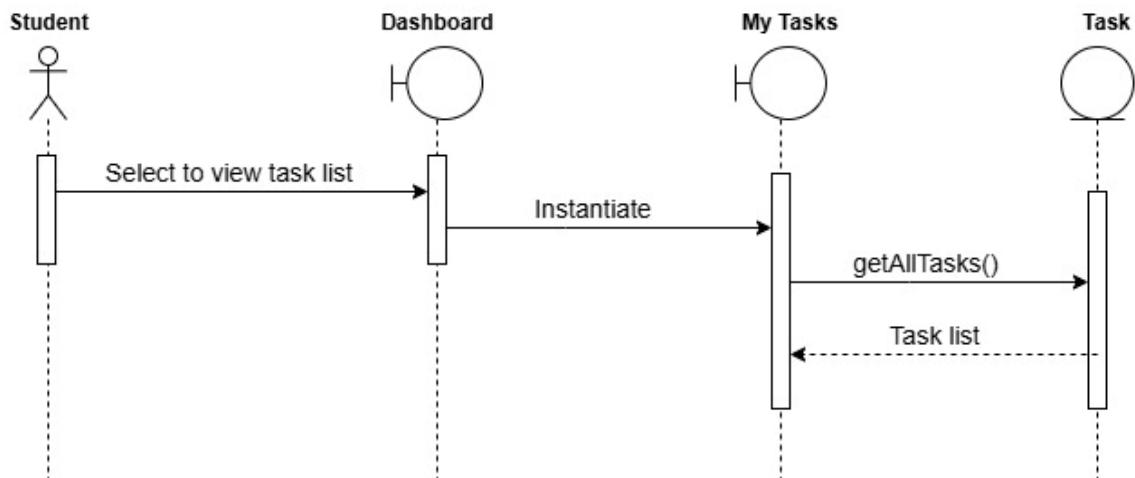


Figure 4.12: View Task sequence diagram

4.5.3 Create Task

The Create Task sequence diagram (see Figure 4.13) illustrates the interactions between the user and the system when creating a new task. This diagram details the process of the user entering task details, submitting the task, and the system saving the new task in the database.

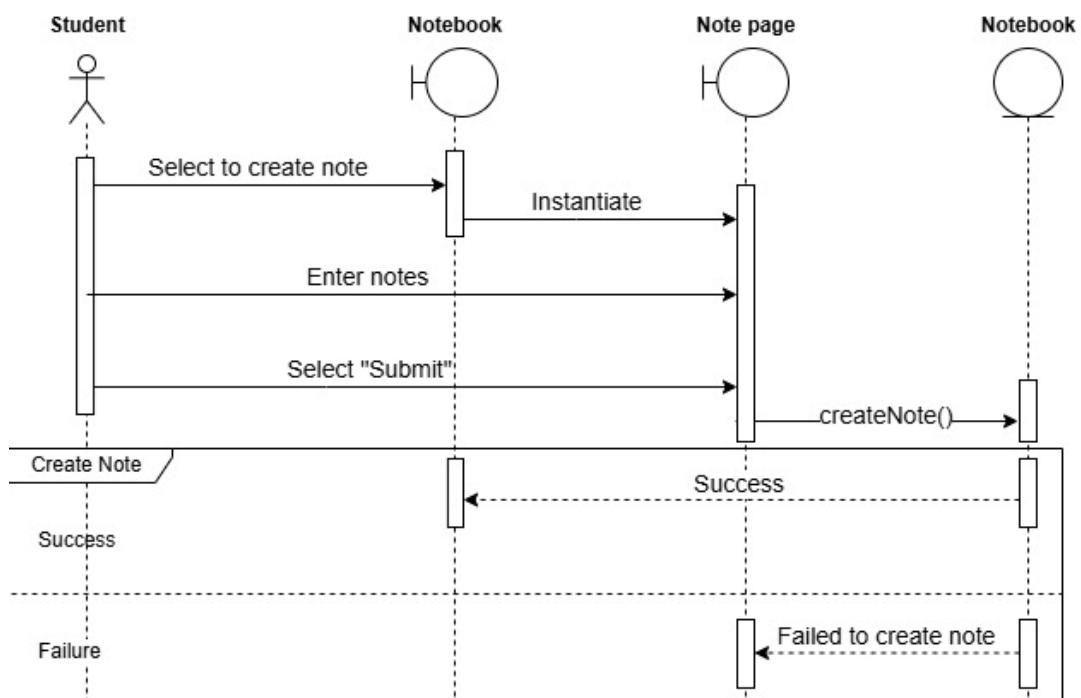


Figure 4.13: Create a Task sequence diagram

4.5.4 Update Task

The Update Task sequence diagram (see Figure 4.14) depicts the steps involved when a user wants to update an existing task. It includes the user selecting a task to update, editing its details, saving the changes, and the system updating the task's information in the database.

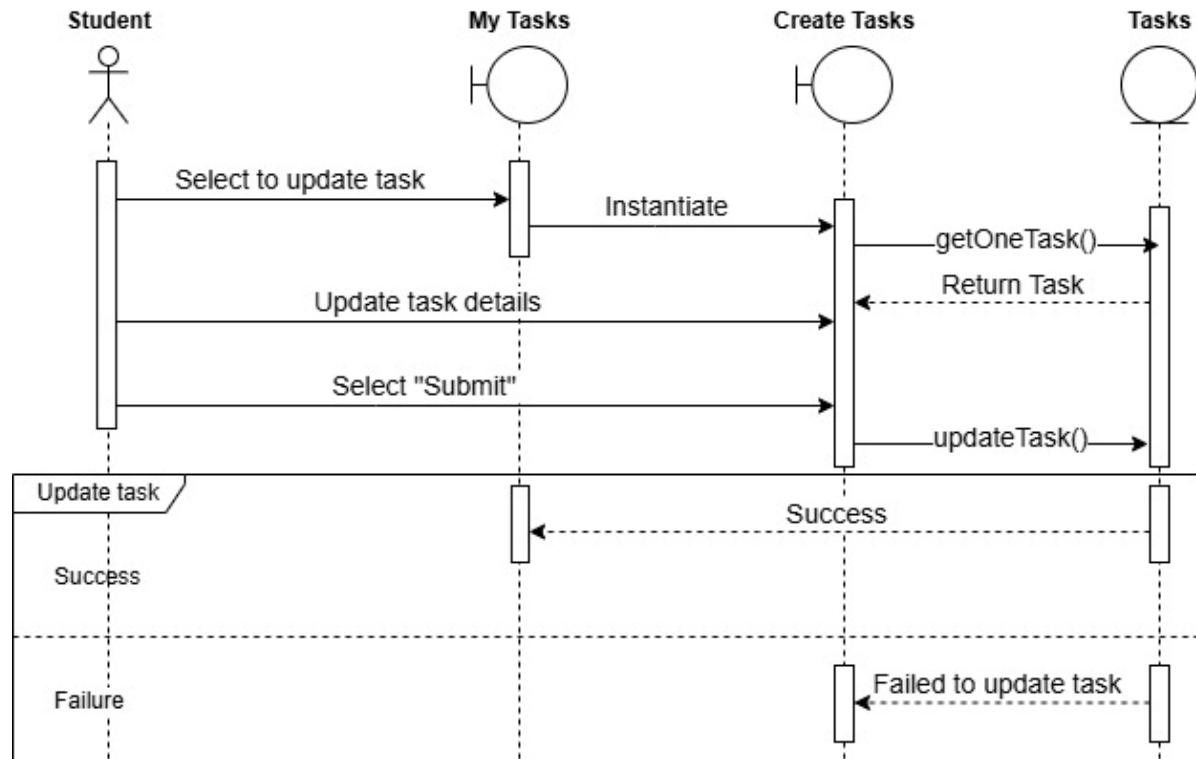


Figure 4.14: Update Task sequence diagram

4.5.5 Delete Task

The Delete Task sequence diagram (see Figure 4.15) demonstrates the interactions required for a user to delete an existing task. The diagram shows the user selecting a task for deletion, confirming the deletion, and the system removing the task from the database.

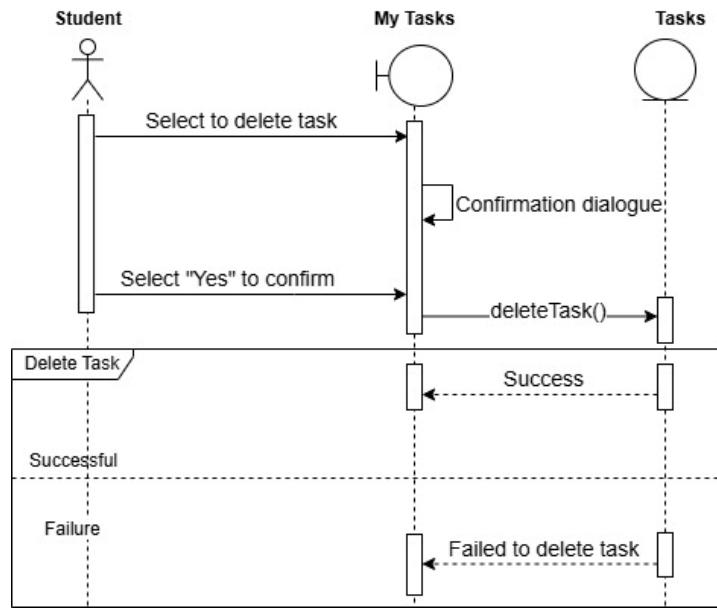


Figure 4.15: Delete Task sequence diagram

4.5.6 Mark Task as Complete

The Mark Task as Complete sequence diagram (see Figure 4.16) outlines the process for marking a task as completed. The diagram details the interactions where the user marks the task as complete, confirms the action, and the system updates the task's status to "Complete" in the database.

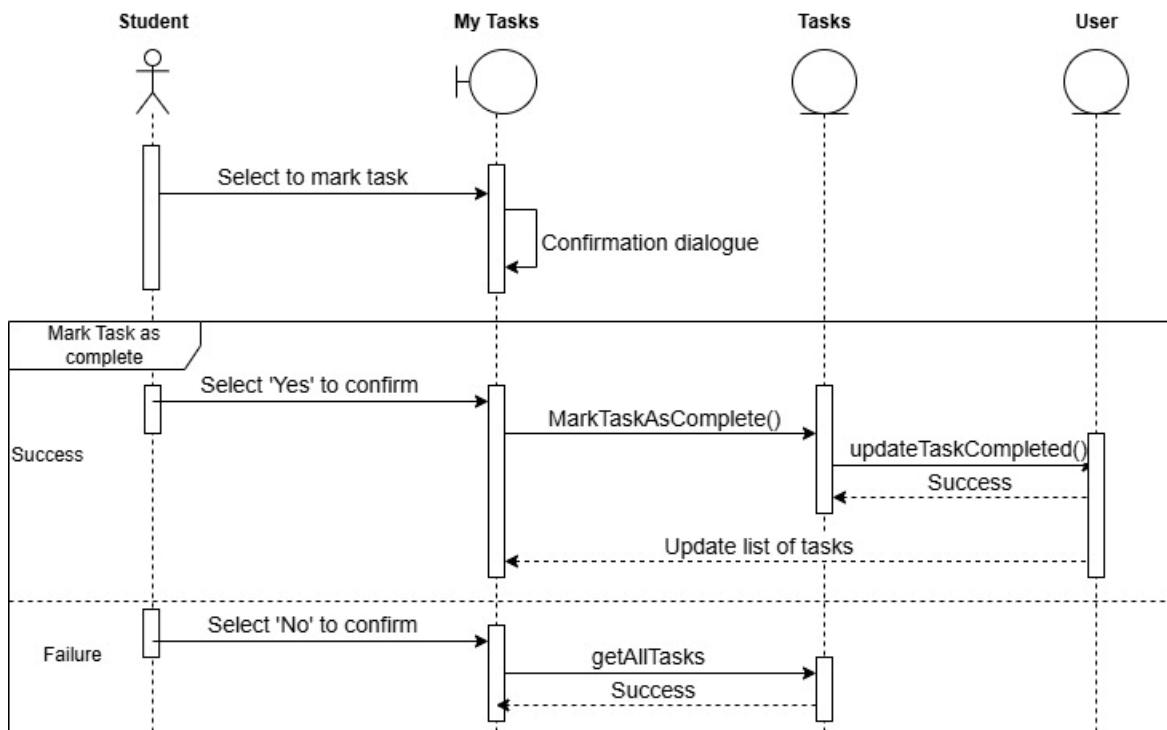


Figure 4.16: Mark Task as Complete sequence diagram

4.5.7 View Calendar

The View Calendar sequence diagram (see Figure 4.17) enables users to access their calendar within the Milestone application. The system displays the calendar for the current day, showing any scheduled tasks or goals.

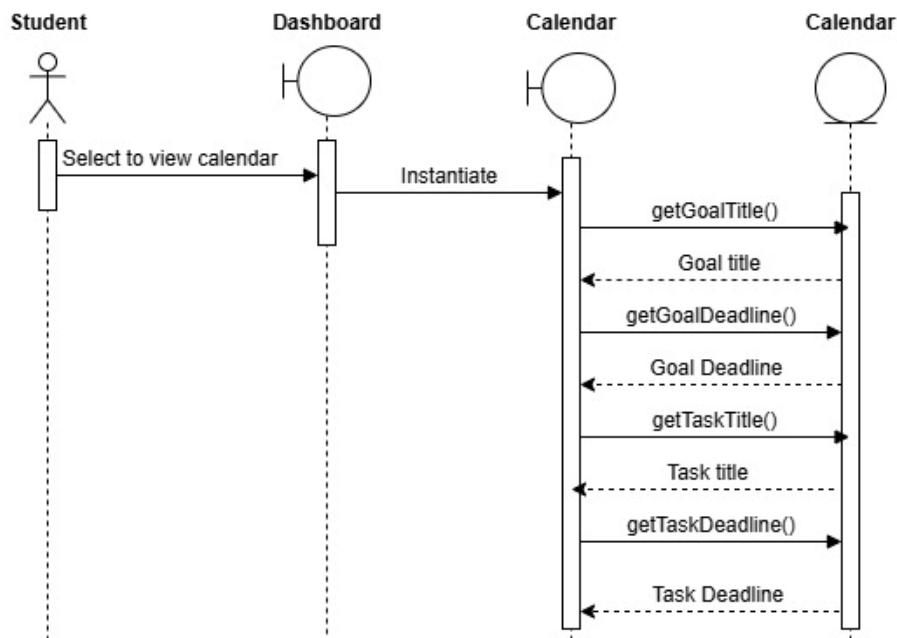


Figure 4.17: View the Calendar sequence diagram

4.5.8 View Notebook

The Notebook sequence diagram (see Figure 4.18) allows users to add, view, edit, and delete notes in Milestone's notebook. The system provides a space for users to keep personal notes related to their academic goals and progress on the notebook.

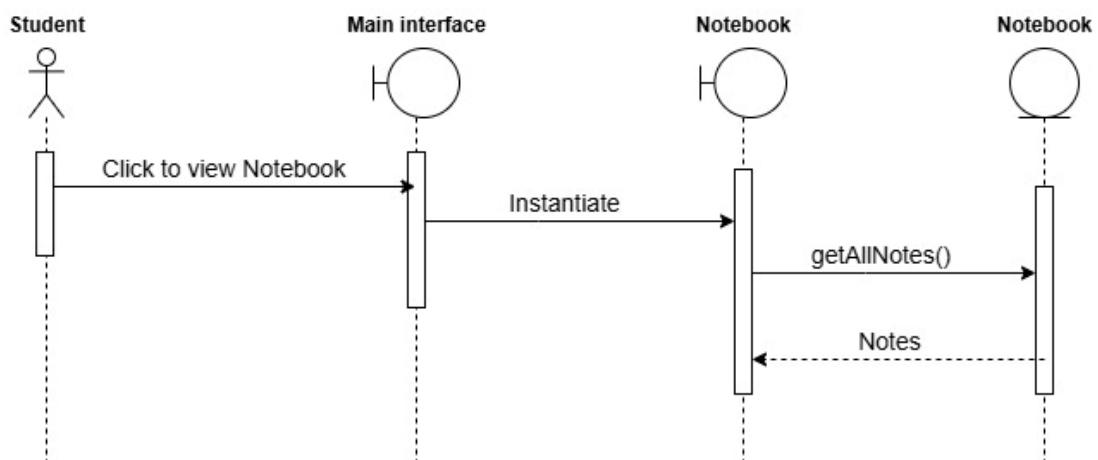


Figure 4.18: View Notebook sequence diagram

4.5.9 Create Note

A note (see Figure 4.19) will be created if the user chooses to on the notebook. This will be one note created out of many other existing notes.

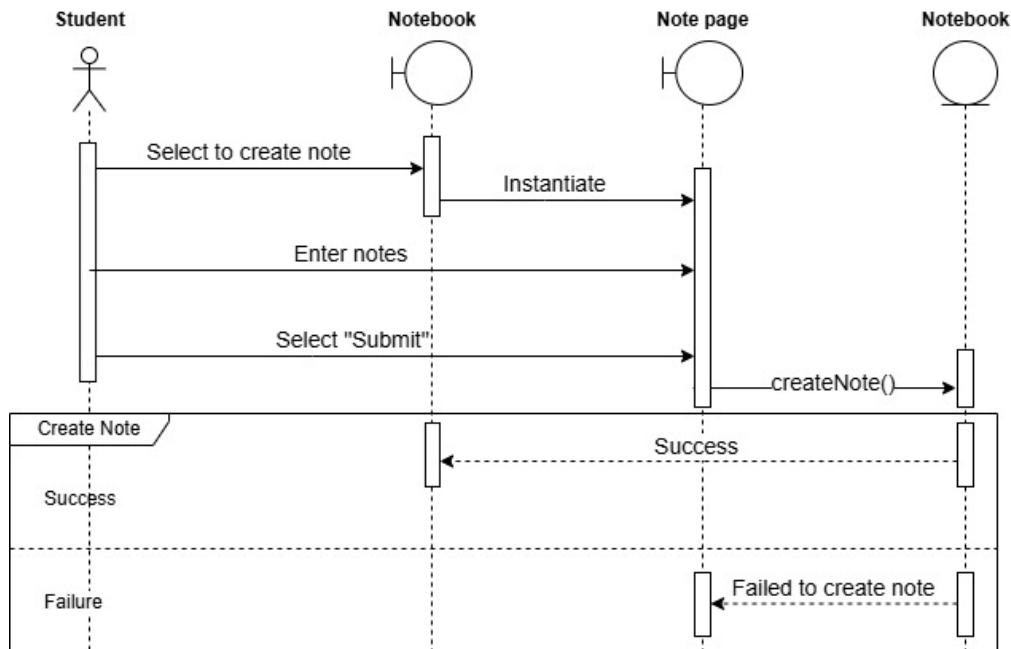


Figure 4.19: Create a Note sequence diagram

4.5.10 Update Note

A note (see Figure 4.20) is updated under the condition that it is already created and the student wants to make adjustments.

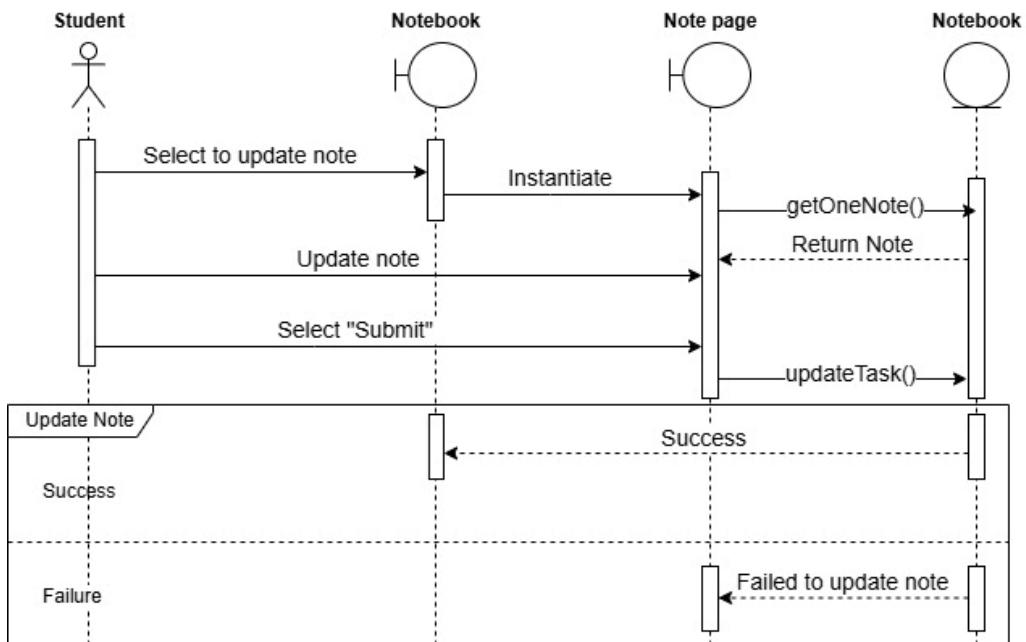


Figure 4.20: Update a note sequence diagram

4.5.11 Delete Note

The user can delete a note (see Figure 4.21) If they do not find it necessary or useful.

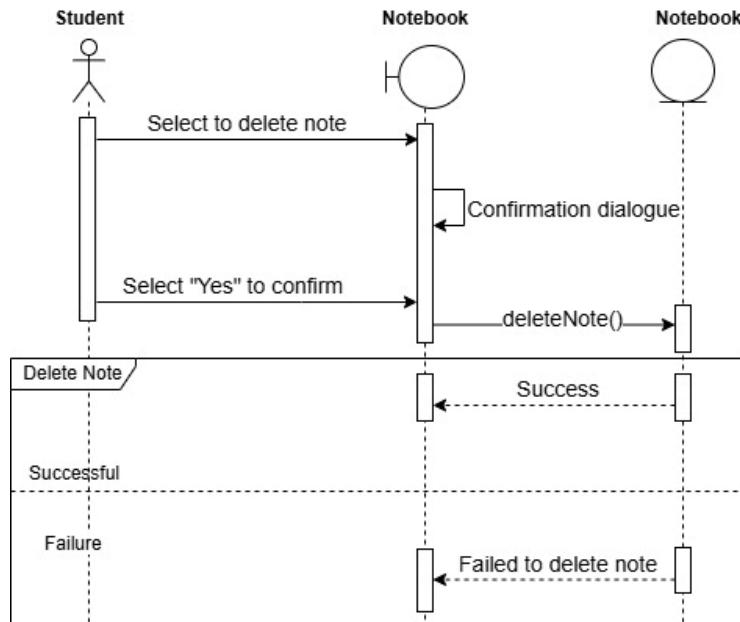


Figure 4.21: Delete a Note sequence diagram

4.5.12 Managing users(Administrator)

The administrator is able to manage users by blocking any users who may be breaching security concerns by forgetting a password that flags the account (see Figure 4.22).

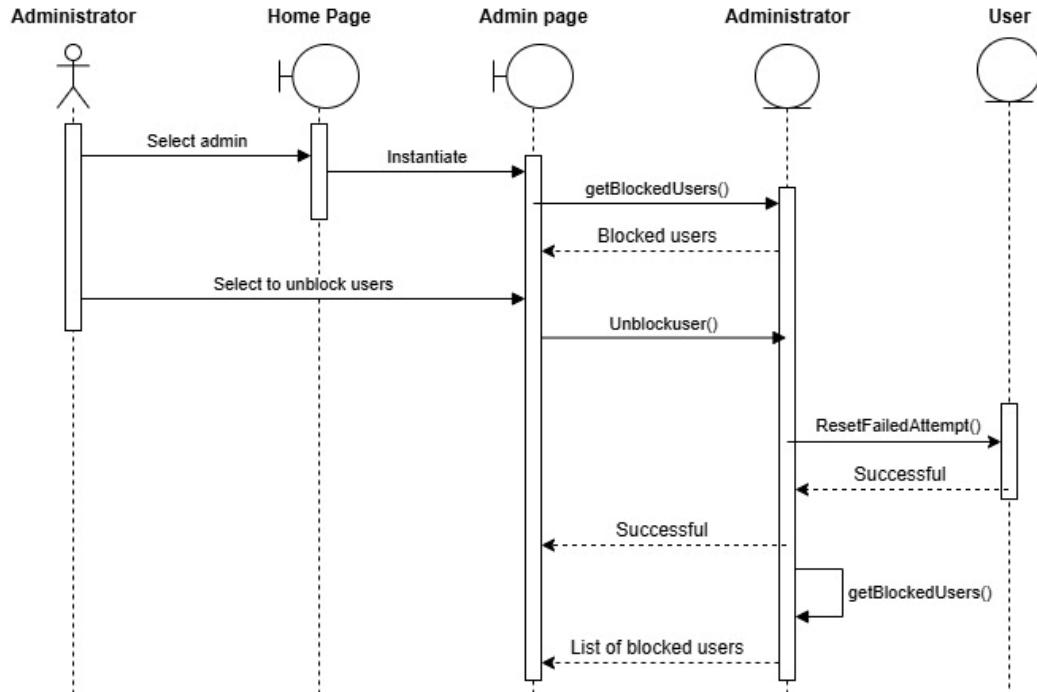


Figure 4.22: Administrator sequence diagram

4.5.13 View Achievements

The View Achievements sequence diagram (see Figure 4.23) allows a user to view their earned achievements and progress towards new badges.

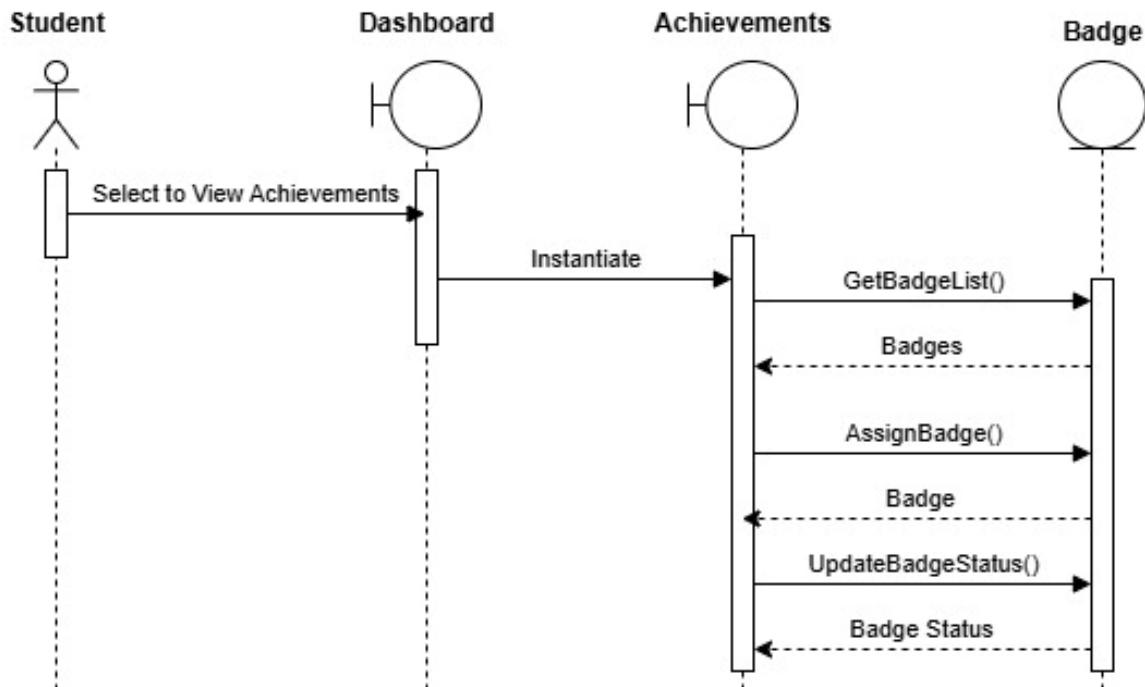


Figure 4.23: Achievements sequence diagram

4.6 Wireframes

The draft wireframes for Milestone was designed on a platform called Axure. Throughout this process, I will use the sequence diagrams to decipher how the interface will operate and use existing Milestone details to design the wireframe.

4.6.1 Log in

Figure 4.24 portrays how the Milestones Log-in page will look when users insert their username and password.

The wireframe shows a login form for 'Milestone'. At the top center is a logo placeholder labeled 'Logo'. Below it is the 'Milestone' logo with the tagline 'Take it one step at a time.' A 'Welcome back!' message is displayed. The form includes fields for 'Username' and 'Password', both with placeholder text. A green 'Submit' button is positioned below the password field. At the bottom left is a link 'Don't have an account? [Sign up](#)'.

Milestone © 2024

Figure 4.24: Log in wireframe

4.6.2 Register

If the user does not have an account, they will be redirected to this page, the registration page in Figure 4.25. All the necessary information will be filled in by the user and submitted so their accounts are created, enabling them to log in.

The wireframe shows a registration form for 'Milestone'. At the top center is a logo placeholder labeled 'Logo'. Below it is the heading 'Create your Milestone account below'. The form includes fields for 'First Name', 'Last Name', 'Username', 'Password', and 'Confirm Password', each with a placeholder text. A green 'Submit' button is located at the bottom right.

Figure 4.25: Register wireframe

4.6.3 Dashboard

The dashboard shown in Figure 4.26 will be the first thing the users see upon logging in, with things they can grab their attention to focus on for the week.

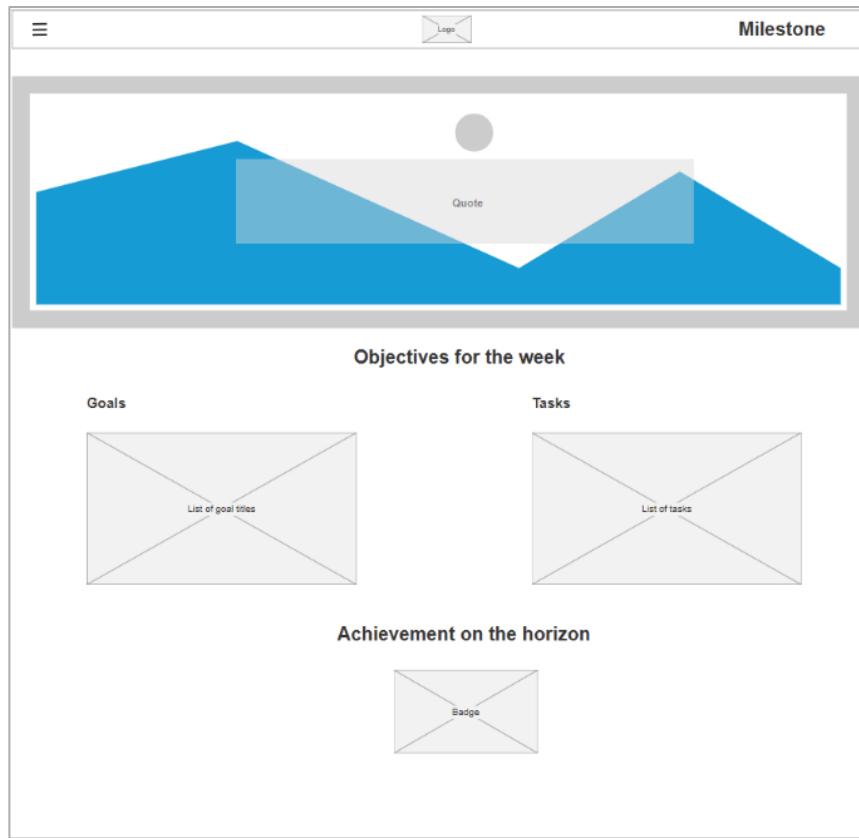


Figure 4.26: Dashboard

4.6.4 Menu

The menu in Figure 4.27 is expected to be a drop-down of the remaining functionalities on Milestone.

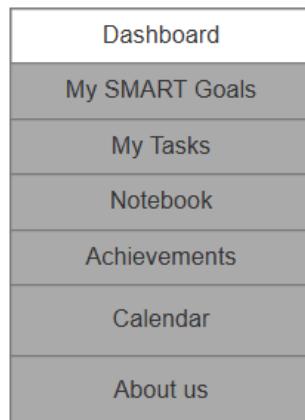


Figure 4.27: Menu wireframe

4.6.5 My SMART Goals

Looking at the interface in Figure 4.28, the user will enable and create the SMART goals upon clicking to create a goal. A line of goals will upload, and the user can add their criteria.

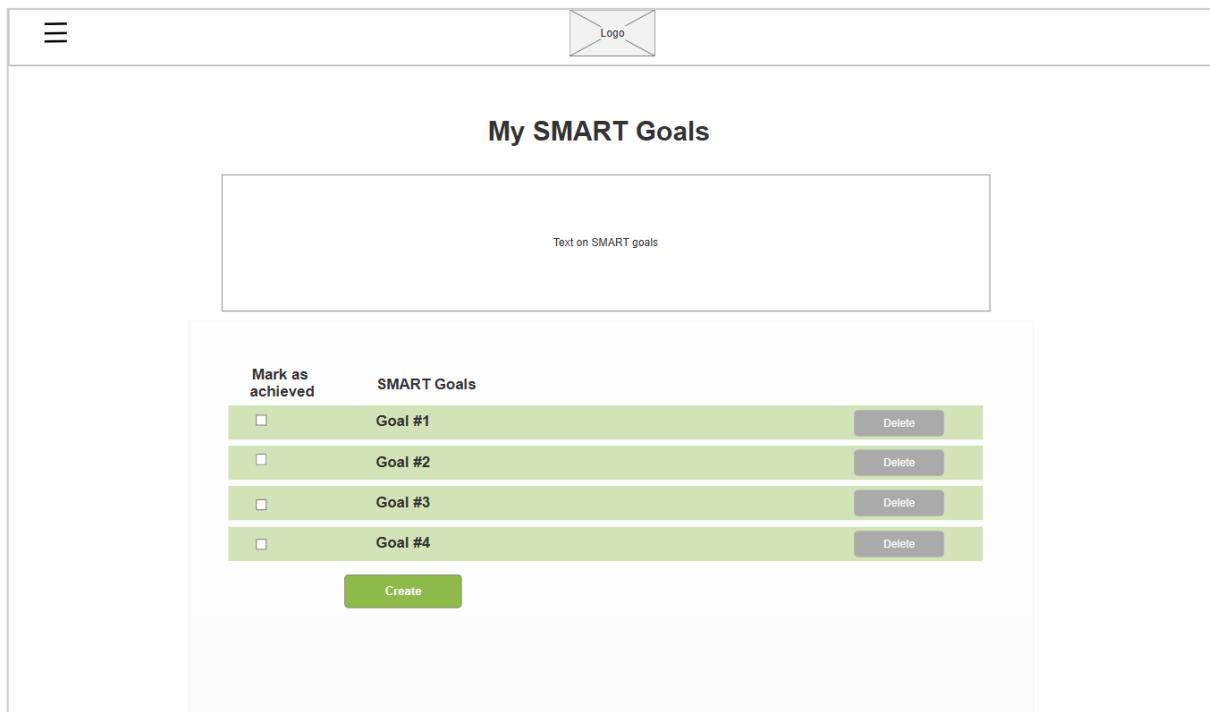


Figure 4.28: SMART goal wireframe

4.6.6 Create a Goal

The user will be able to create a goal, Figure 4.29, and add their criteria which are goal details ensuring that they meet the specifications and remain honest about their academic milestones.

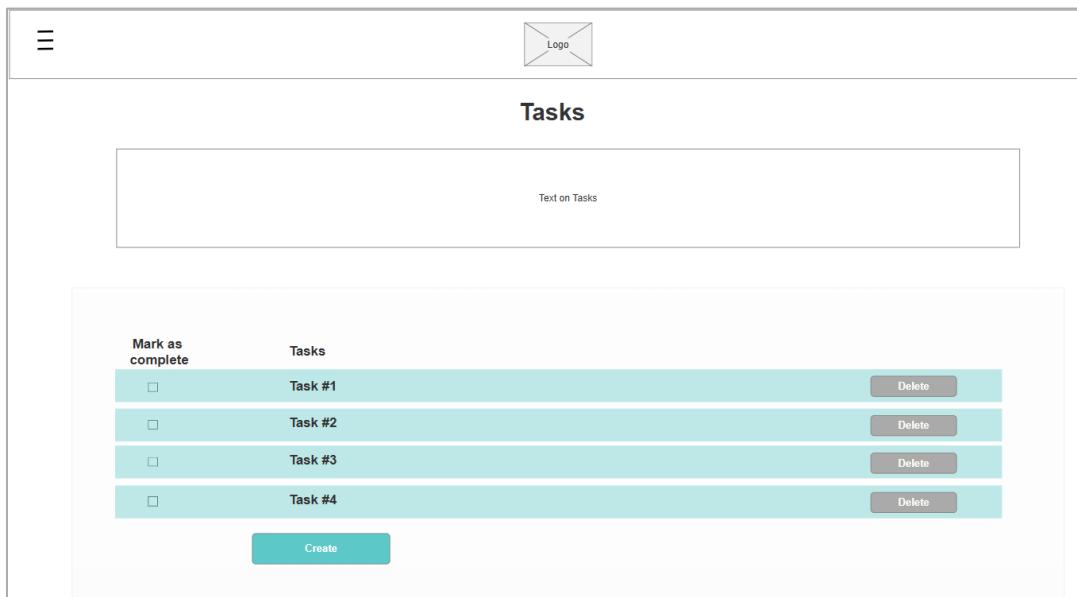
Create your goal

Specific	What is your goal?
<input type="text"/>	
Measurable	How will you know when you have achieved the goal?
<input type="text"/>	
Achievable	How realistic is the goal for you?
<input type="text"/>	
Relevant	How does the goal align with your core values?
<input type="text"/>	
Time bound	When can this goal be achieved
	<input type="text"/>
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

Figure 4.29: Create a goal

4.6.7 My Tasks

The tasks will be in a similar format to SMART goals, where the tasks are created, allowing the user to create, delete, edit, and mark tasks as complete. This is evident in Figure 4.30.



Mark as complete	Tasks	
<input type="checkbox"/>	Task #1	<input type="button" value="Delete"/>
<input type="checkbox"/>	Task #2	<input type="button" value="Delete"/>
<input type="checkbox"/>	Task #3	<input type="button" value="Delete"/>
<input type="checkbox"/>	Task #4	<input type="button" value="Delete"/>

Figure 4.30: My Tasks wireframe

4.6.8 Create Task

The user will be presented with a tab that opens when they would like to create a task; this is displayed in Figure 4.31.

Create your task

Title:

Description:

Due date:

SUBMIT CANCEL

Figure 4.31: Add Task wireframe

4.6.9 Notebook

The notebook shown in Figure 4.32 allows users to add notes and update as they please. As soon as they are completed writing their notes, the system will save their changes so that when they return, the information is still available and displayed.

≡

Notebook

Title 0
0
0

Title 0
0
0

Title 0
0
0

Title 0
0
0

Notes

Submit Cancel

Figure 4.32: Notebook wireframe

4.6.10 Achievements

The system displays a ladder of potential achievements, the user's progress towards each badge, and any badges already earned. This is displayed in Figure 4.33.

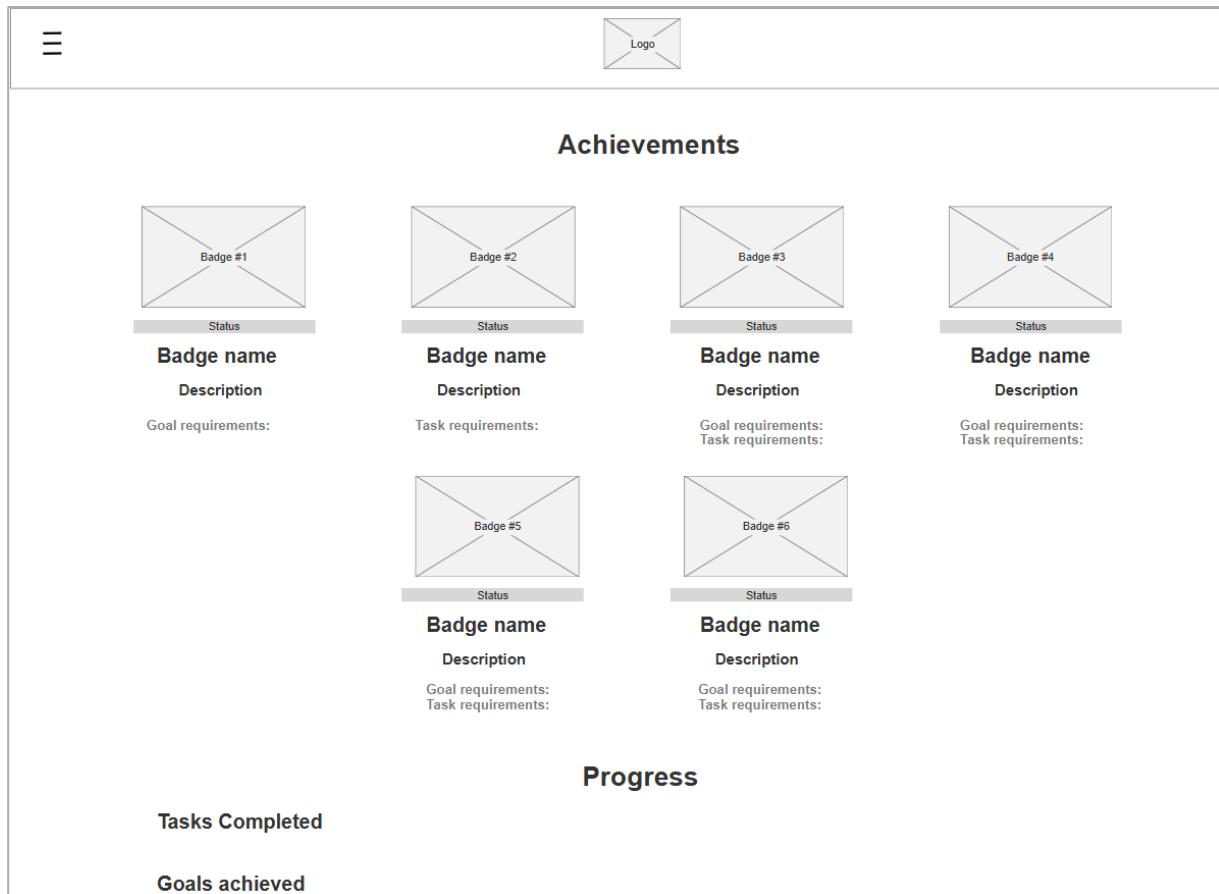


Figure 4.33: Achievements wireframe

4.6.11 Calendar

The calendar is displayed in Figure 4.34, showing how the user can view their SMART goals and tasks.

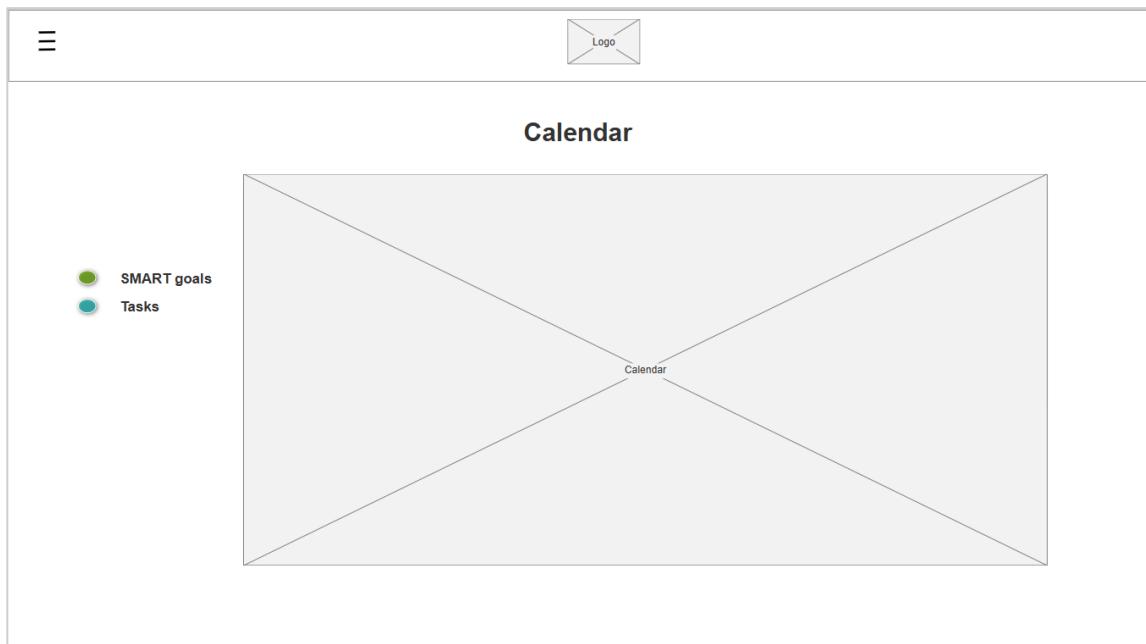


Figure 4.34: Calendar

4.6.12 Administrator dashboard

The administrator dashboard displayed in Figure 4.35 shows how the administrator can view the student's username and unblock them.

A screenshot of the administrator dashboard. At the top left is the title "Administrator". At the top right is a logo icon. The main title "Manage users" is centered above a form. The form has a label "Username:" followed by an input field. To the right of the input field is a large gray rectangular area containing the word "List". To the right of the list are five green rectangular buttons, each with the word "Unblock".

Figure 4.35: Administrator dashboard

4.7 Colour palette

Upon creating the wireframes of Milestone, I made use of Adobe colour to find a colour palette that goes with Milestone as displayed in Figure 4.36.

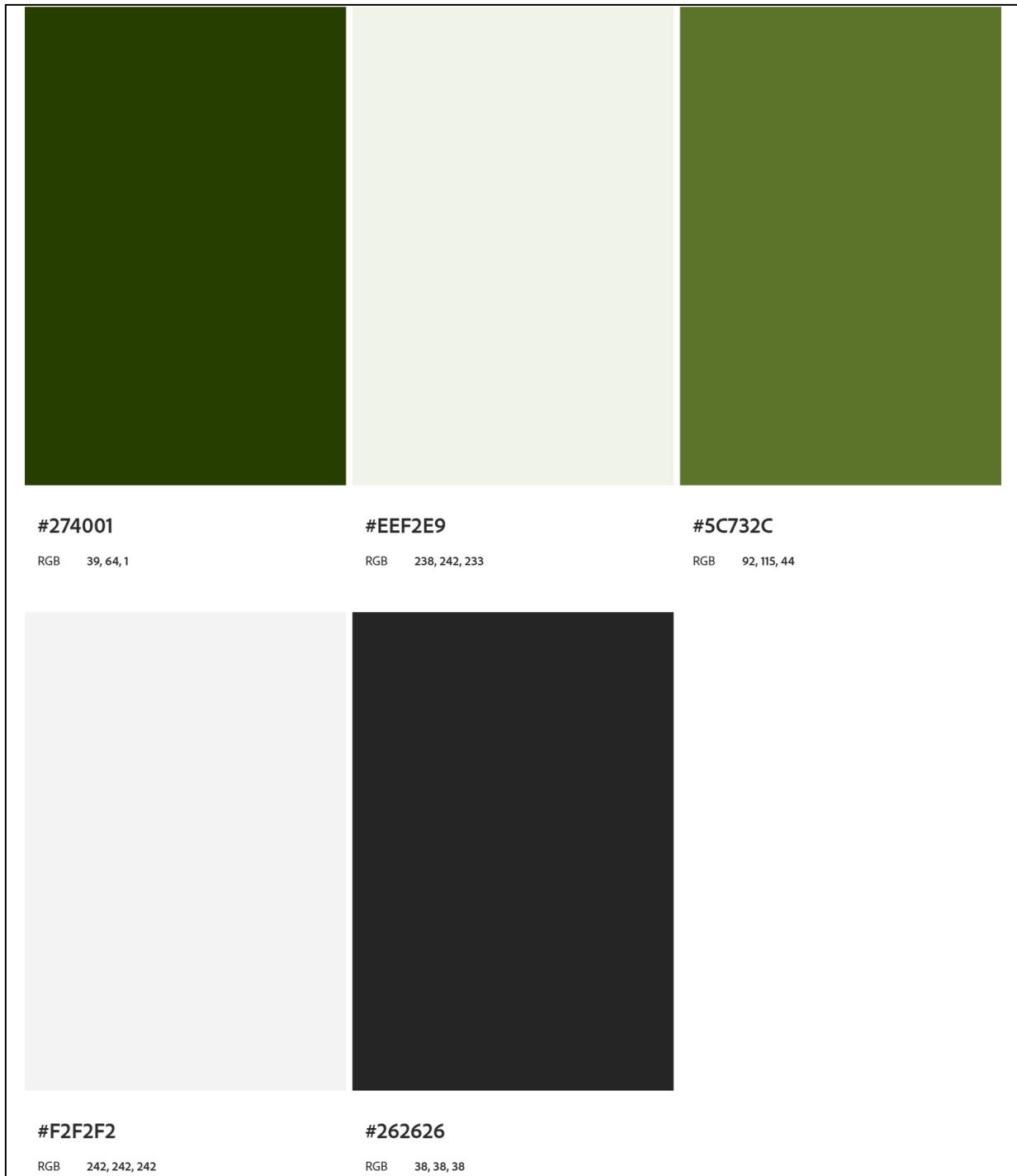


Figure 4.36: Color Palette

4.8 Motivation for technology used

I used a software application named Axure to create the prototype of the Milestone web application. Axure RP is a popular software tool for designing and prototyping user interfaces and user experiences (UI/UX). It allowed me to create interactive wireframes and high-quality prototypes without writing much code.

Here are the main functionalities and benefits of using Axure I encountered:

- **Wireframing and Prototyping:** Users can create low-fidelity wireframes to map out the layout and structure of a user interface and then turn those wireframes into high-fidelity interactive prototypes.
- **Interactivity:** Axure enables designers to add interactions, such as click actions, hover states, dynamic panels, and conditional logic, allowing them to mimic user behaviour and showcase how a product will function.
- **Collaboration and Feedback:** Users can share prototypes with team members and stakeholders through Axure Cloud, facilitating collaboration and allowing for comments and feedback directly on the prototype.
- **Design Components:** Axure includes a library of pre-built widgets, symbols, and components that help speed up the design process and ensure project consistency.
- **Responsive Design:** Designers can create adaptive views to accommodate different screen sizes, ensuring the prototype looks good on various devices.
- **Documentation:** Axure supports documentation capabilities, allowing teams to generate specifications, annotations, and reports accompanying prototypes. This helps communicate the intent behind designs.
- **Integration and Exports:** It integrates with other design tools and allows exporting designs for use in different contexts, such as HTML for web applications.

There are certain benefits to Axure that I noticed:

- User-Centric Design.
- Improved Communication through visual and interactive communication tools.
- Time Efficiency to reduce the time needed to go from concept to prototype.
- No Coding Required.

- Flexibility.

Choosing Axure as the platform for designing my web application "Milestone" was an empowering decision that pushed my project to new heights of creativity and efficiency. Axure's tools and impressive features brought my goal-setting-based application to life in a visual and user-friendly manner. Through Axure's advanced prototyping capabilities, I crafted interactive designs that effectively demonstrate the functionality and flow of my application, motivating both myself and my users to reach their milestones confidently. Embracing the possibilities of Axure, I was able to transform my vision into a tangible reality and create a web application that is not only impactful but also meaningful. The sequence diagrams went hand in hand with designing the wireframes to ensure the operation of the web application. I used Axure to design the completion of the Milestone horizontal prototype by assigning commands and actions to the necessary tools.

4.9 Summary

This chapter outlined the architectural design of the Milestone application. Throughout this process, I presented the sitemap for Milestone to show the website's navigation structure. The entity relationship diagram is the structure for the database for Milestone, ensuring all data types and entities are aligned with the webpage structure. Additionally, sequence diagrams were used to describe how the web application will interact with the user and the system in sequence. I then motivated the technology used for the wireframes on Axure and its continuous design for the prototype.

Chapter 5 - Prototype

5.1 Introduction

I created the prototype by developing Milestone's wireframes into a platform usable to its users. Through this, I learned many different features of Axure, such as repeaters, dynamic panels, and property panels, to make Milestone function for its intended purpose. In this chapter, I will explain some of the numerous functions I used to create the Milestones prototype.

5.2 Password Validation

Looking closely at the login and signing of user information, Figure 5.1 displays a section of the interactions I used to design the password validation process on the signup page. I defined multiple conditions, starting with the interaction that if no password is entered, a warning message appears. If the password is eight characters long and contains capital letters and small letters, the password indicator goes from weak too medium and too strong. I had to create local variables to read if the words were upper or lower case (e.g. LVAR1.toLowerCase ()).

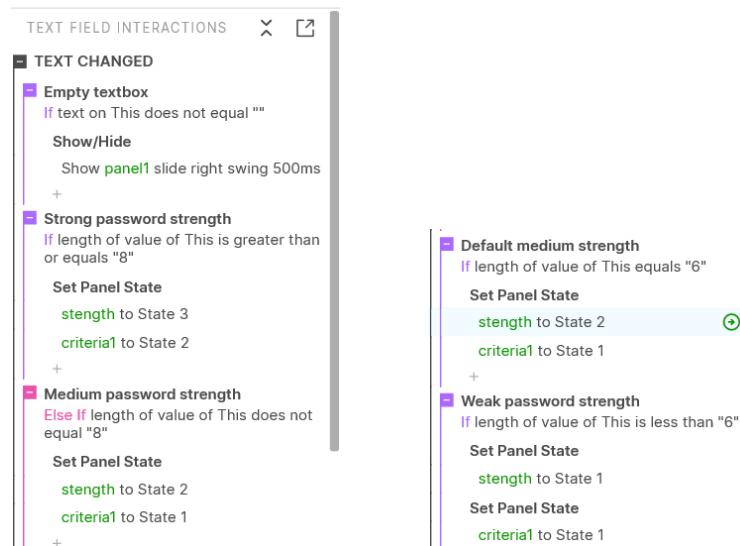


Figure 5.1: Password source code

A dynamic panel is a container that holds other widgets in sets called "states". A panel can have one state or many, and only one of its states is visible at a time. The visible state can be set dynamically with the "Set Panel State" action. For the password

validation, I made four dynamic panels. A combination of these panels is attached to one main panel, displayed in Figure 5.2. They include:

- Password strength, which had 3 panel states (Weak, medium and strong)
- A capital letter dynamic panel with 2 states (Tick or cross)
- A character-length dynamic panel with 2 states (Tick or cross),
- And the other for the password validation box.

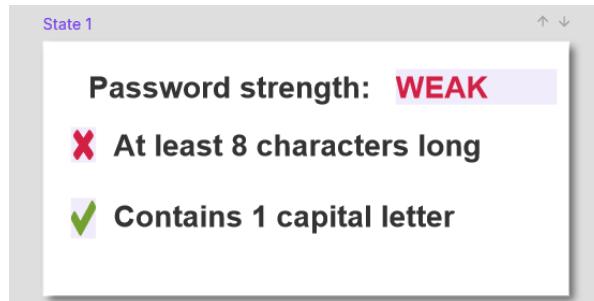


Figure 5.2: Password strength indicator

5.3 Repeater

Creating a repeater for the SMART goals was one of the most challenging when designing the prototype. A repeater is a function in Axure that repeats a row or column, especially when the user opts to create multiple goals. It was an obstacle using variables such as `LVARGoaltitle` to hold data made by the user because Azure does not provide any database integration. Figure 5.3 displays the variables added to the repeater table. I had to design conditions for local variables to be linked to the repeater rows to store user input data. Every time the user clicks to create a goal, a row is added to the repeater

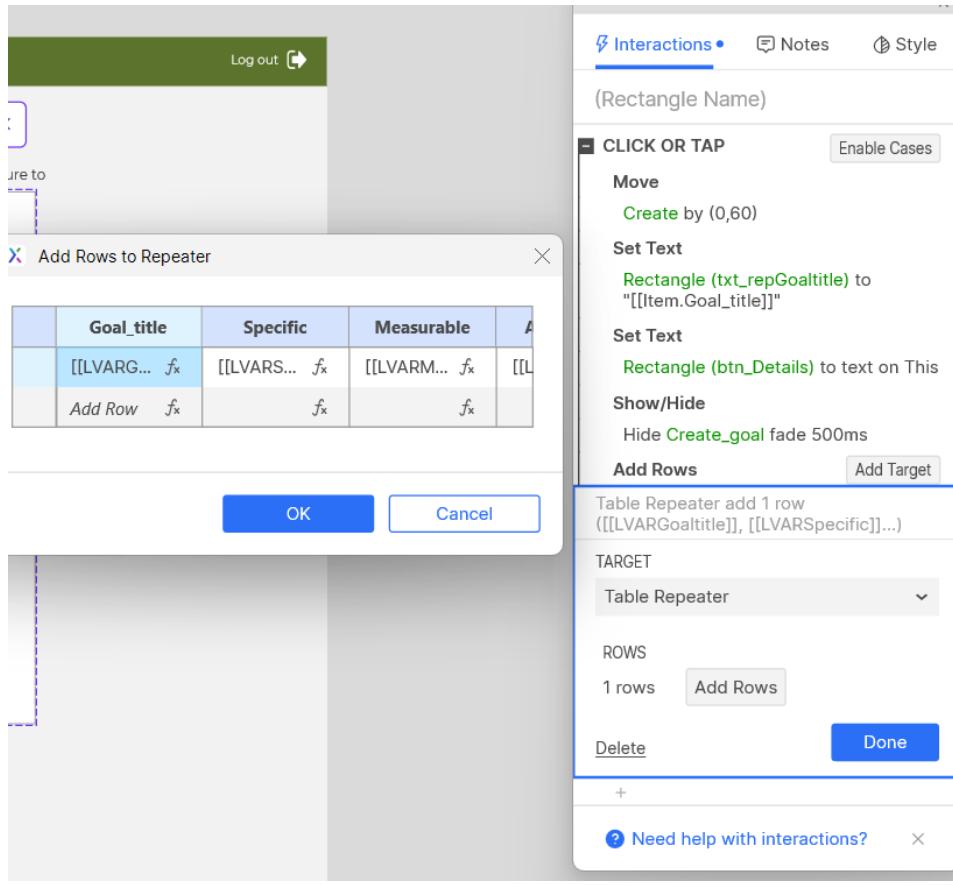


Figure 5.3: Repeater

5.4 Variable sorting

Following the repeater struggle, Figure 5.4 displays the click condition I used to set the global variable to connect the repeater data which are items. This is where the data that the user saves will be stored. To add, the global variable is then used to connect to the text fields of the page where the user creates the goal. To organise the data, it goes from the text field (e.g. txtSpecific) to the global variable (e.g. selectedGoalSpecific), to the local variable, to the item in the repeater (e.g. Item.Specific) that saves the data. When the user wants to view the saved details, it is inverse.

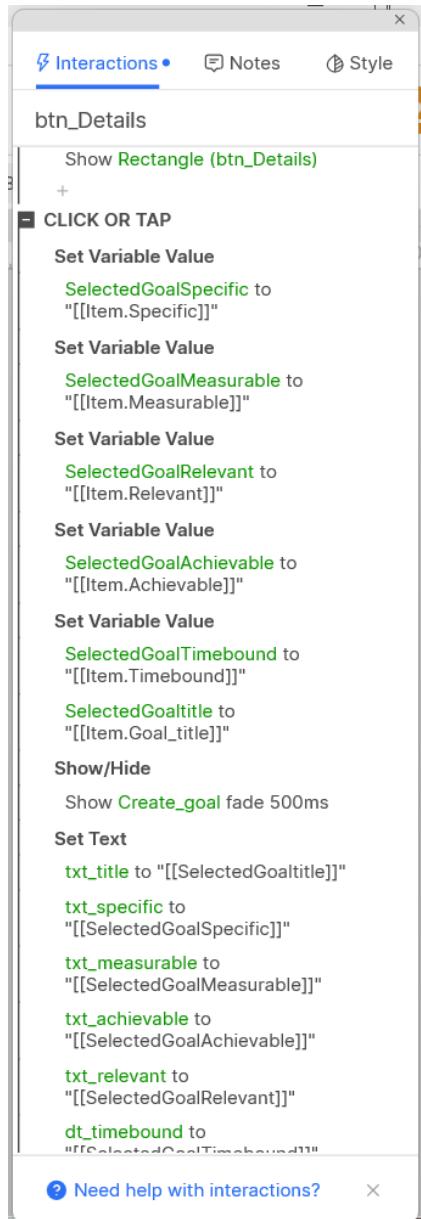


Figure 5.4: Variable sorting

After all of this was implemented, a clear table interaction was added to the “create goal” button to prevent the already-made data from displaying. This is shown in Figure 5.5.

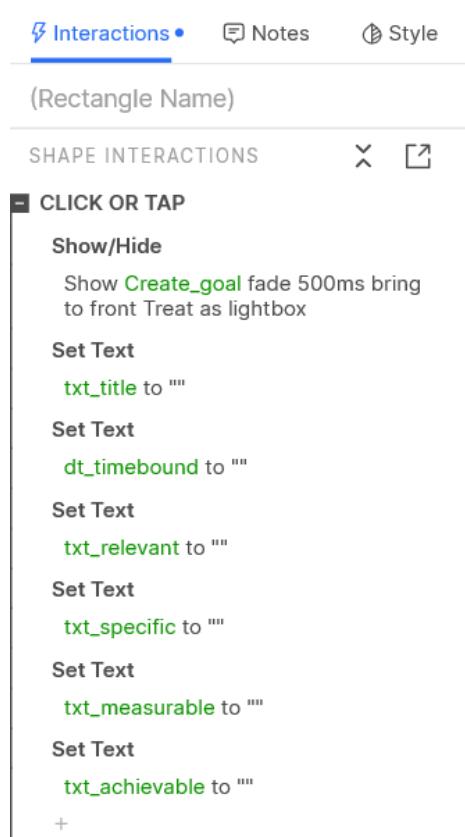


Figure 5.5: Clearing goal data

5.5 Global variables

Figure 5.6 displays all the global variables I created to be able to hold data. These variables are used in every page of Milestone.

Global Variables

Variables store data that persists across pages in the web browser.
Variable names must be alphanumeric, less than 25 characters long, and contain no spaces.

+ Add Duplicate Up Down Delete Search...

Variable Name	Default Value
OnLoadVariable	
isFirstTimeUser	true
SelectedGoalDetails	
SelectedGoalSpecific	
SelectedGoalMeasurable	
SelectedGoalAchievable	
SelectedGoalRelevant	
SelectedGoalTimebound	
Selected_MarkGoalsComple	false
SelectedGoaltitle	
SelectedTaskTitle	
SelectedTaskDescription	
SelectedDate	
Notes	0
N1content	
N2content	
N3content	
N4content	
GoalData	
TaskData	

OK Cancel

Figure 5.6: Global variables

5.6 Notebook

Upon creating the Notebook page displayed in Figure 5.7, I designed it creatively so the user can create a total of four notes and display them if they create a note. These notes are created if the user clicks “Create note”. The notes are held together by many dynamic panels instructed in the interaction section. The content saved goes to a global variable such as `N1content` for the `note1panel`. I also created an increment, `Notes` to `[[Note]] +1`, to display the notes individually.

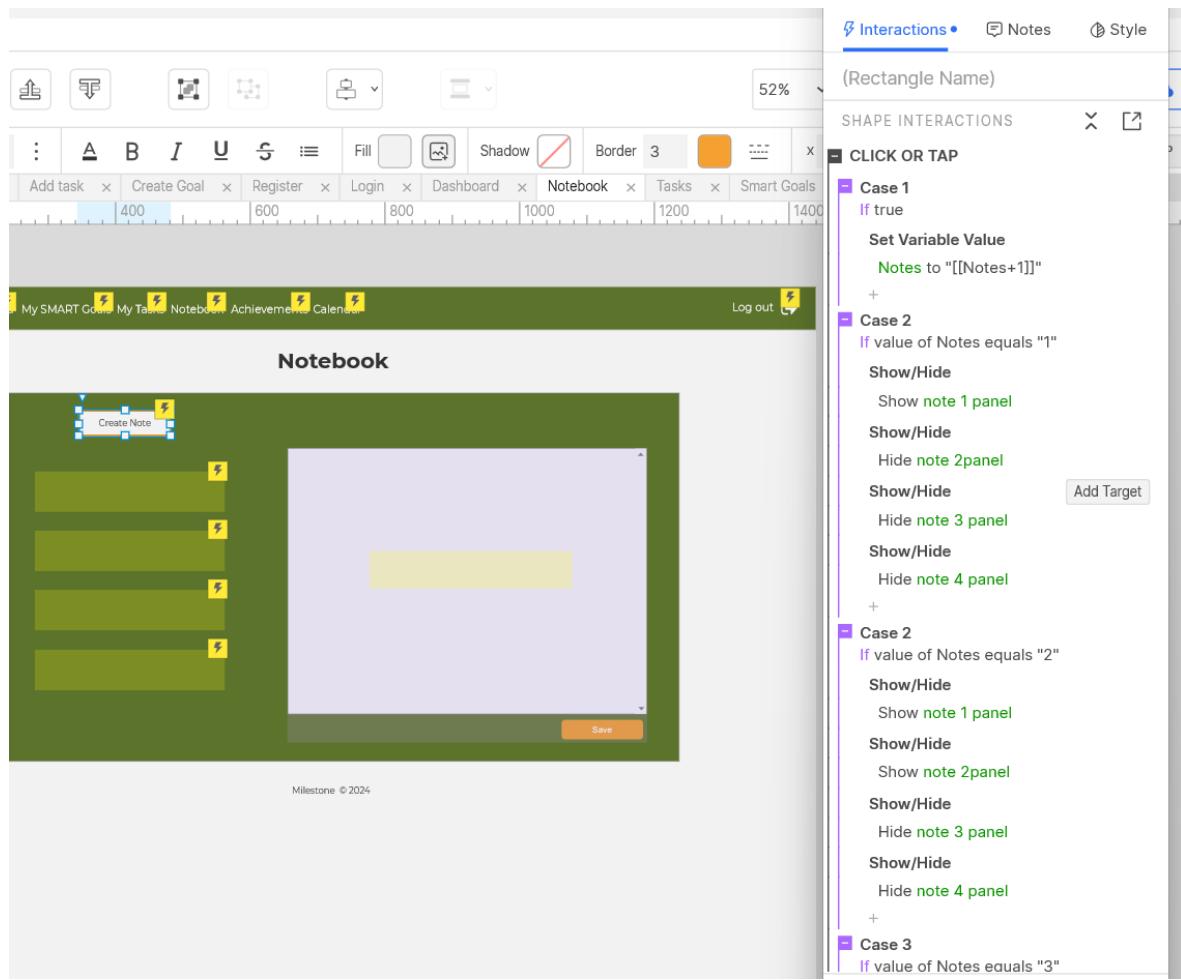


Figure 5.7: Notebook

5.7 Summary

The discussion in this chapter outlined how I utilised repeaters in Axure to create the tasks and SMART goals functionalities of the Milestone prototype. The global variables were useful in storing the data so that the relevant information is displayed on the current window. The `if` statements used in creating the notes were similar to the password validation, which shows how the concept was helpful throughout the prototype.

Chapter 6 - Evaluation

6.1 Introduction

I evaluated the prototype by performing a usability test to collect data on how participants experience Milestone. This usability test included pre-test and post-test questionnaires, a task sheet, and an observation sheet. The discussion in this chapter outlines the evaluation strategy, including the usability test conducted on a representative sample of the target population I chose. A usability test protocol was compiled to provide consistency during the formalities of the research with each participant. The results from this test will be used to identify potential ways the Milestones prototype can be improved.

6.2 Evaluation strategy

The testing objective was to take notice of the user interaction with Milestone. I performed an in-person moderated methodology (Krueger, 2015) to observe the participants as they used Milestone. In-person moderated methodology is a qualitative research approach that involves a moderator guiding a discussion or a set of activities with participants in a physical setting.

I used quantitative evaluation (McLeod, 2023) because it was the most suitable strategy for this prototype to collect and analyse data. Compared to qualitative evaluations, quantitative evaluations are more time-efficient, scalable, and standardised and have better results in data analysis.

Ethical clearance for this study was obtained from the General/Human Research Ethics Committee at the University of the Free State (UFS) (Ethical clearance number: UFS-HSD2020/0524/1505/21/22/3) (see Appendix B).

6.3 Usability test

6.3.1 Population and sampling strategy

The population for this usability test consisted of students currently enrolled at the UFS. The research sample comprised five students from this population. A convenience sampling strategy was used to select the participants. In convenience sampling,

participants are selected based on availability and willingness to participate (Hassan, 2024). To recruit potential participants, I sent them a message on WhatsApp explaining the study and asking if they would be interested. I also offered to answer any questions they might have had about the study.

6.3.2 Usability test protocol

Following the recruitment, each usability test was conducted according to the following procedure:

1. I explained the Participant Information Sheet and Consent form (see Appendix C) and allowed the participant to ask questions before consenting to participate.
2. The participant completed the pre-test questionnaire (see Appendix D).
3. The participant completed predetermined tasks on the Milestone prototype (as outlined in Appendix E).
4. I used an observation sheet (see Appendix F) to note how the participants reacted to specific tasks.
5. The participant completed the post-test questionnaire (see Appendix G).
6. I audio-recorded the participant's final thoughts on Milestone, asking:
 - a. What they liked about the system.
 - b. What they did not like about the system.
 - c. Suggestions of features they would like to see on Milestone.

6.4 Results

All the usability test sessions were conducted on the UFS campus. One session was scheduled in the computer discussion labs in the White Computer Laboratory building. The other four took place in the Honours laboratory of the Department of Computer Science & Informatics. The participants used my personal computer to conduct all the questionnaires.

Participants performed the entire testing on the same day, 26 September 2024. I followed my usability test protocol. The participants took between 19 and 27 minutes to complete the usability test. This concluded with a mean time of 00:23:40. Figure 6.1 displays the usability test time graph.

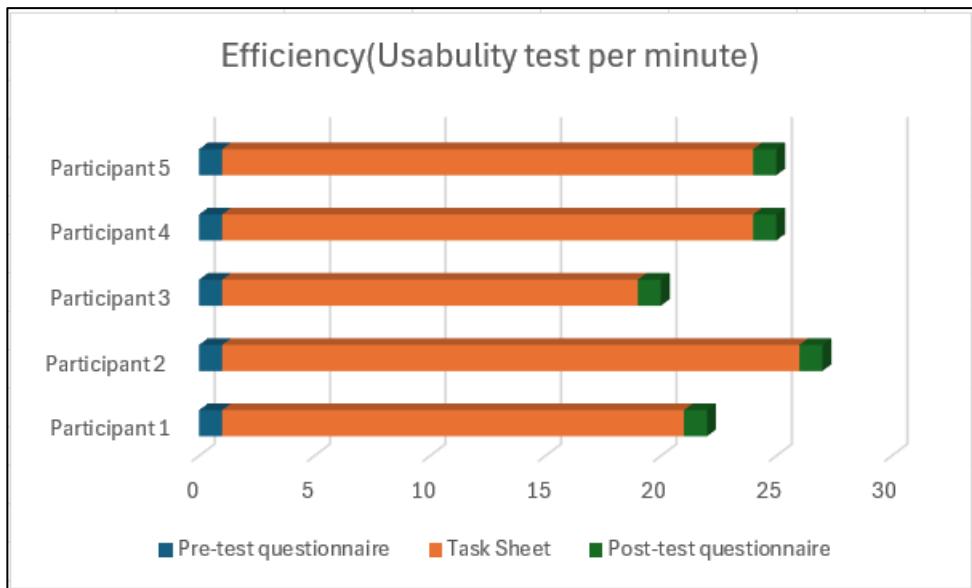


Figure 6.1: Usability test time graph

6.4.1 Pre-test questionnaire

The five participants had to complete a pre-test questionnaire on Google Forms to begin the usability test. The information was essential to see the differences in background and exposure to goal setting. Some had more knowledge about user design and user experience, providing a different perspective to that of less technical participants in different faculties that pay attention to different things.

The pre-test questionnaire provided a basis to get an image of the participant's familiarity with using goal-setting platforms, their devices, and how progress is measured. Figure 6.2 displays the ability to manage weekly assignments, tasks, and tests. The measures range from 1 being strongly disagree to 5 being strongly agree.

5. Are you able to manage your assignments, test preparations, and daily tasks on a weekly basis throughout the academic period?

5 responses

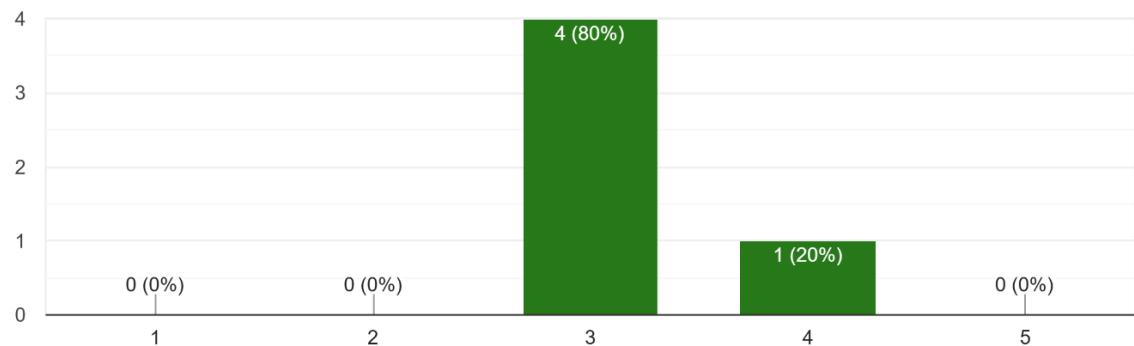


Figure 6.2: Managing assignments

Most participants (80%) struggled to create goals (see Figure 6.3). Those who struggled mentioned that they found it challenging to set realistic goals.

9. Do you face challenges when creating goals for yourself?

5 responses

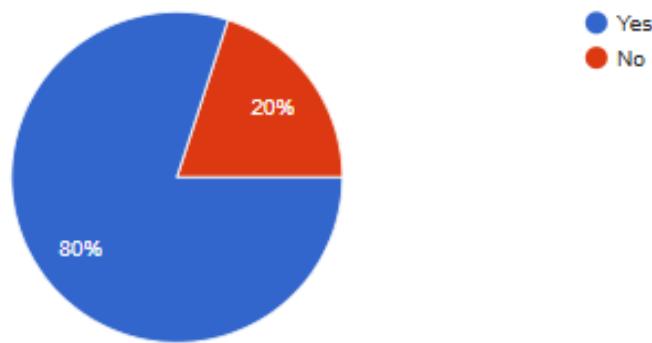


Figure 6.3 : Goal creating challenge

A follow-up question from Figure 6.3 regarding the participant's challenges with creating goals is shown in Figure 6.4.

10. If you answered yes in the previous question, please specify:

4 responses

Whether they realistic. Whether due dates to complete the goals are realistic

Being realistic with my goals.

I struggle with setting realistic goals

The challenges I face when creating goals sticking to the time period I set to complete my goals.

Figure 6.4: Follow-up question on Goal creating challenge

None of the participants used specific methods or tools to track their academic goals (see Figure 6.5).

7. Do you currently use specific methods or tools to set and track your academic goals?

5 responses

- Yes
- No

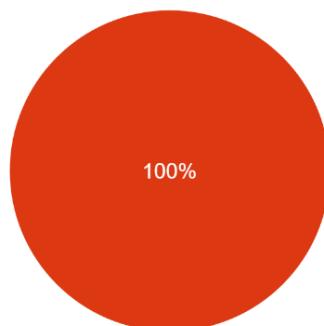


Figure 6.5: Tracking goals

6.4.2 Task analysis

The participants followed instructions and tasks in the task sheet while using Milestone. Each followed the task sheet from the first registration task, followed by tasks involving the website's functionalities, such as task management, goal management, and notebook management.

Registration, Login & Logout

The participants found navigating and accessing Milestone easy by registering and logging in. During the registration process, they filled in the information with no issues, and the system successfully let them register and log in. The users also had no complications with the final task of logging out.

Task Management

Task management describes Milestones feature of creating, editing, viewing, and deleting tasks. During this process, all the participants did all the tasks perfectly, with the system not producing any bugs or technical issues.

Goal Management

80% of the participants instinctively found the 'View details' goal list during the task activities, as shown in Figure 6.6. One participant was less confident and did not manage to do the same.

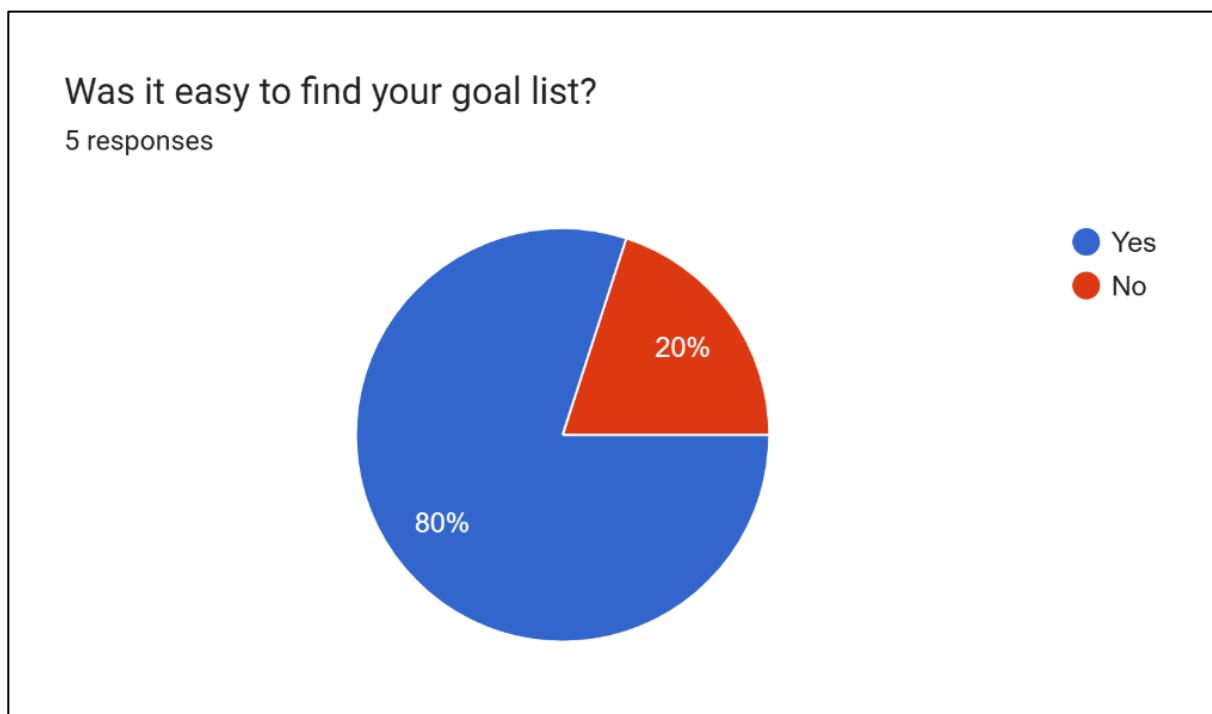


Figure 6.6: Goal list

The pie chart in Figure 6.7 depicts how 80% of the participants noticed a confirmation message when deleting their goal.

Did the system ask for confirmation before deletion?

5 responses

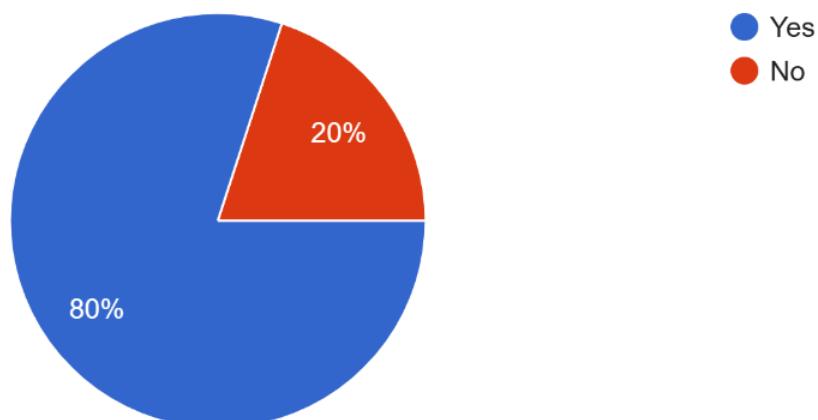


Figure 6.7: Confirmation

Notebook

The participants found it relatively simple to create and save a note (see Figure 6.8).

Was it easy to create and save the note?

5 responses

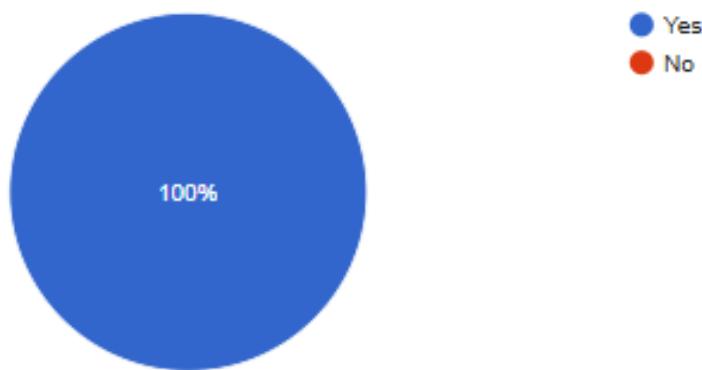


Figure 6.8: Creating and saving a note

The notebook tasks puzzled a few participants despite their ease in creating and saving notes. Figure 6.9 displays a 40% and 60% split for the task process.

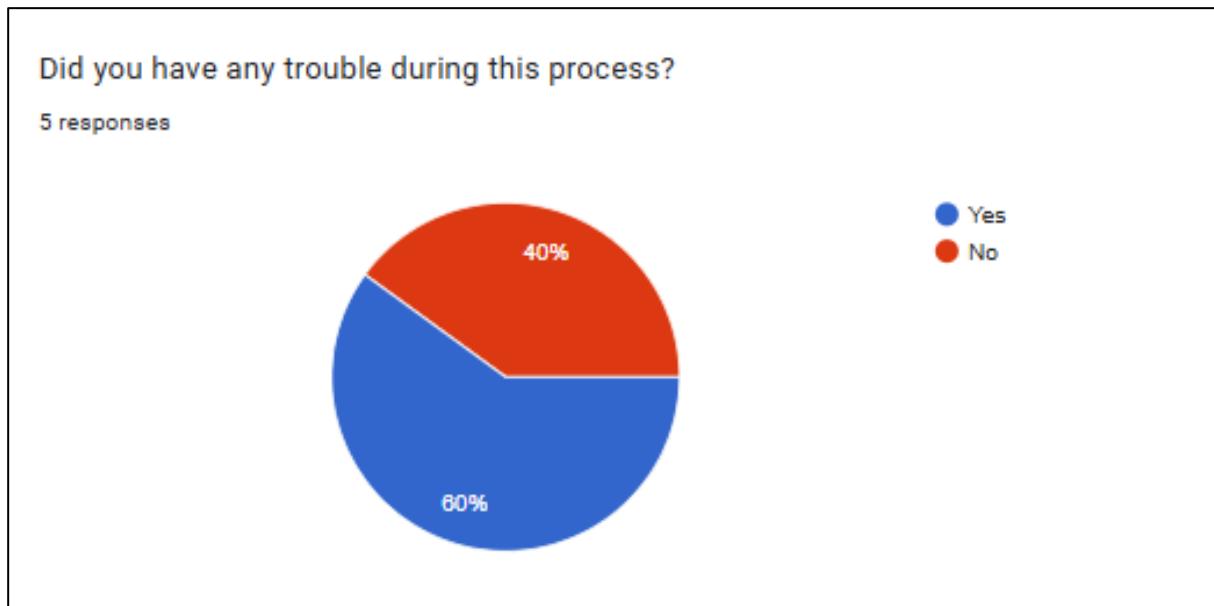


Figure 6.9: Note creation difficulty

A follow-up question helped me identify the participants' issues, as shown in Figure 6.10.

If so, please elaborate on why it was difficult.

2 responses

Clicking the note when first created was a little difficult to wrap my head around

It was a bit confusing opening the note and typing on it. I did not understand correctly that I was supposed to click on the word note and not the blank page.

Figure 6.10: Follow-up question on Note task

Achievements

The participants navigated to the achievement page and viewed their progress in earning badges. The progress and badges on display received positive responses from the participants, and the task activity was successful.

Calendar

The Calendar had little interaction features so the participants viewed the Calendar and its contents. There were no issues identified during this task.

Feedback

The task sheet had a section that included immediate participant feedback after the tasks. The pie chart in Figure 6.11 shows how there was a bug during the test.

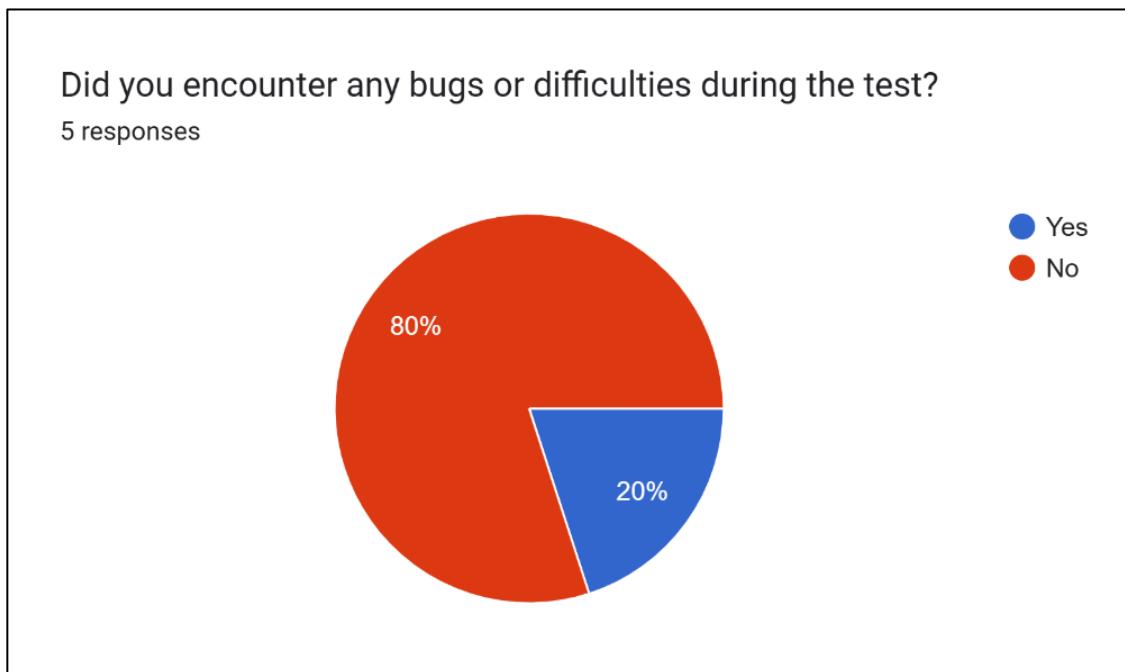


Figure 6.11: Bugs

6.4.3 Post-test questionnaire

The post-questionnaire and the audio recording concluded the usability test by asking the participants about their overall experiences, thoughts, and suggestions on Milestone. I did not create the questions in the post-test questionnaires, as I used them from the study by Laubheimer (2018) on the Nielson Norman Group website. The ten questions were necessary using the quantitative method to evaluate usability using the SUS score. The System Usability Scale (SUS) score is a questionnaire that evaluates a product's usability (Bhat, 2018).

According to Bangor et al. (2009), SUS scores are interpreted in this scoring system:

- 70 - 100 is Acceptable,
- 50 - 70 is Marginal, and
- 50 is not Acceptable.

The participants in this study had an average SUS score of 90 (see Table 6.1). The average SUS score of 90 falls within the Acceptable range, showing how the system is

user-friendly and acceptable to the participants. It is a website that is usable to the intended users.

Table 6.1: Average SUS score

Participant	SUS Score
1	80
2	85
3	100
4	90
5	95
Average SUS score	90

After participants completed the post-test questionnaire, I recorded an audio asking the participants three general questions about what they liked and disliked about Milestone and any suggestions they might have. The participants' responses are summarised in Table 6.2.

Table 6.2: Participant responses from audio recording

Participants	Likes	Dislikes	Suggestions
1	Colour coordination, layout, ease of the eyes, features such as the animation characters, and the flow of the website made it fun to use.	Bugs in the marked goal ticks were disappearing.	None.
2	It was easy to use and could compact things to do and when to achieve the goal.	None.	The log-out button and symbol serve the same purpose.
3	Adding tasks and goals automatically to the calendar.	Need feedback when successfully deleting a task.	Progress graphs.
4	Easy to learn and navigate.	Some of the instructions on goals and tasks were not clearly worded.	None.
5	Task feature to write daily tasks.	Confusion creating a note(clicking the wrong widget)	Reminders to complete a task.

6.4.4 Usability issues identified

Based on my observations, all the users navigated through Milestone with ease. From logging in to creating a task, the users could complete all the necessary tasks without getting lost or confused. The qualitative feedback was vital as it helped identify potential bugs and interactive features that may have been in question. The identified bug was marking goals and tasks and how the tick box would unmark when deleting a single goal. The interactive feature was whether the participant could click on the interactive features. This allowed me to change the widget by adding a “click me!” label.

The issues identified were as follows:

1. Some instructions in the task sheet were not specific enough. There was a specific moment in the task sheet where Participant 4 second-guessed where the View details button was after looking back at the menu. I fixed the issue by stating that it was a button, not a menu tab, and equally for the View task button.
2. The log-out text confused Participant 2 as they wanted to click on it instead of the log-out button next to it. I made both options available to the user to make the process easier.
3. During Participant 1's usability test, I noticed that the goals and tasks would be unmarked when deleted. Therefore, I ensured they were marked as completed and achieved for the examples already set on Milestone.
4. The animated figures in Milestone did not have a “click me!” label, as Participant 1 was curious to know the purpose of the animation being there. This then allowed me to add the instructions.

6.5 Milestone Improvements

Following the result of the usability test, the following changes were made to the Milestone prototype:

- Made the label ‘log out’ work when the user clicks it, just like the logo.
- Added the click me button to all the animations.

The following additional features (as suggested by the participants) will be considered for future versions of Milestone:

- Progress chart

6.6 Summary

The evaluation chapter outlined the usability of Milestone through the validation of participants. I conducted a usability test with five participants who had different experiences with achieving academic goals and had different approaches to achieving them. Convenience sampling helped me to effectively communicate and attend to the participants at the designated time of the meeting. It all started with a prequestionnaire that asked simple questions about academic goal setting and technical familiarities. Following that was the task sheet that instructed participants to perform specific tasks. Lastly, the post-test questionnaire informed me about how they rated the whole experience overall. The participants completed the usability test successfully, with overall positive feedback to Milestone. A SUS score of 90 concluded that the system was user-friendly and beneficial to students.

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Appendix A – Requirements Gathering Survey



Milestone

Dear Participant,

Thank you for your interest in providing feedback for Milestone, a goal-setting web application dedicated to helping university students like yourself achieve their academic goals and improve productivity. Your insights are invaluable as we strive to create a platform that effectively meets your needs.

Your privacy and confidentiality are of utmost importance to us. Rest assured that all the information you provide in this questionnaire will be used for Milestone and no other external use. Please feel free to answer the following questions. It will take 4-6 minutes to complete.

2020035362@ufs4life.ac.za [Switch account](#) 

 Not shared

* Indicates required question

Goal setting and achievement:
Indicate the extent to which you agree with each of the following statements.

1. I set goals that are meaningful to me. *

1	2	3	4	5	
Strongly disagree	<input type="radio"/> Strongly agree				

2. I frequently set new goals. *

1	2	3	4	5	
Strongly disagree	<input type="radio"/> Strongly agree				

3. I focus on my own personal improvements when setting goals, rather than comparing myself to others. *

1 2 3 4 5

Strongly disagree

Strongly agree

4. I base my goals on data, including prior experiences, interests, skills, and feedback from family members, teachers, peers, or other trusted persons. *

1 2 3 4 5

Strongly disagree

Strongly agree

5. I face challenges when setting and achieving my academic goals. *

1 2 3 4 5

Strongly disagree

Strongly agree

6. Goal setting is important to me in my academic life. *

1 2 3 4 5

Strongly disagree

Strongly agree

7. I feel motivated when I get rewarded for achieving my goals. *

1 2 3 4 5

Strongly disagree

Strongly agree

8. Do you currently use specific methods or tools to set and track your academic goals? *

Yes

No

9. If you answered yes in the previous question, what kind of methods or tools do you use?

Short answer text

After section 1 Continue to next section



Section 2 of 3

Features and functionalities:



Indicate the extent to which you agree with each of the following statements.

10. I manage my time effectively. *

1 2 3 4 5

Strongly disagree

Strongly agree

11. I often struggle with poor planning in my academic pursuits. *

1 2 3 4 5

Strongly disagree

Strongly agree

12. I believe social media negatively influences my productivity and goal achievements. *

1 2 3 4 5

Strongly disagree

Strongly agree

13. I use a notebook or journal to write down the tasks I need to complete or any other academic reasons.

1	2	3	4	5	
Strongly disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Strongly agree

14. What challenges do you face in achieving your academic goals? (Select all that apply)

- Overwhelmed from an overload of work
- Poor planning
- Making excuses
- Fear of failure
- Lack of task allocation from small to large tasks
- Negative Influence of social media.
- Decline in motivation and accountability.
- Poor time management.
- Other...

*

15. What functionalities would you like to see in a goal-setting web application? (Select all that apply)

- Goal setting
- Task Management
- Short and long-term goal planning
- Calendar
- Achievements and badges for progress
- Collaboration with other students
- Progress tracking
- Motivational messages

16. Other than the options listed in this question, what other features would you want to see in a goal-setting platform?

Long answer text

Section 3 of 3

Additional Feedback:



Description (optional)

17. Is there anything else you would like to share about your needs or expectations for Milestone?

Long answer text

18. If you would be interested in participating in prototype testing for Milestone, please provide us with your email address.

Short answer text

Appendix B – Ethical Clearance

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

29-Apr-2024

Dear Prof Lizette De Wet

Continuation/Report Approved

Research Project Title:

CSI Honours Projects Ethical Clearance

Ethical Clearance number:

UFS-HSD2020/0524/1505/21/22/3

We are pleased to inform you that the application to extend your ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

Dr Adri Du Plessis

Chairperson: General/Human Research Ethics Committee

Dr Adri
du
Plessis
Digitally
signed by Dr
Adri du Plessis
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Appendix C – Participant Information Sheet and Consent Form



Research study information leaflet and consent form

Date

September 2024

Title of the research project

Milestone Usability Evaluation

Principle investigator / researcher(s) name(s) and contact number(s):

Name of student/researcher	Student number	Contact number
Tinomudaishe Manyeruke	2020035362	0620585902

Faculty and Department:

Natural and Agricultural Sciences
Computer Science and Informatics

Study leader name and contact number:

Name of Study Leader: Prof Liezel Nel
Contact number: (051) 401 3591

What is the aim / purpose of the study?

The main purpose of Milestone is to help university students to achieve their goals. Using Milestones' goal-achieving drive, the functionalities being provided, such as creating goals, tasks, and notes, have the potential to propel students to be diligent in their work and assess how much work they put in daily.

The aim of this study is to:

- Assess the usability and user experience of the Milestone prototype.
- Evaluate the functionality of key features of the prototype (e.g. goal setting, notes, tasks, calendar, dashboard).
- Gather user feedback for continuous improvement for the prototype.

Who is doing the research?

Tinomudaishe Manyeruke, a BCIS postgraduate student at the University of the Free State, will conduct the research. He is doing this project because it is not only a prerequisite of the degree but something he values and has learnt the importance of since starting his university journey. He intends to inform more students about goal setting and magnify its importance.

Has the study received ethical approval?

This study has received approval from the Research Ethics Committee of UFS. A copy of the approval letter can be obtained from the researcher.

Approval number: UFS-HSD2020/0524/1505/21/22/3



What is the nature of participation in this study?

As part of this usability evaluation, you will be asked to complete two short questionnaires (one at the end and one at the start of the session) and a series of tasks on the Milestone prototype. The researcher will observe your interactions with the prototype as you work on these tasks. Each evaluation session will be approximately one hour long.

What are the potential benefits of taking part in this study?

The benefits of this study include personal growth and insight into your goal-setting habits and the opportunity to influence the design and functionality of Milestone.

What is the anticipated inconvenience of taking part in this study?

The inconvenience of participating in this study is the loss of study time. Because the study will take approximately one hour, the time taken to get to the research venue, partake in the research and leave will require extra time out of your day.

Will what I say be kept confidential?

Confidentiality of information will be maintained, your name will not be recorded anywhere, and no one will be able to connect you to the answers you give. Your answers will be given a fictitious code number or a pseudonym, and you will be referred to in this way in the data, any publications, or other research reporting methods, such as conference proceedings. The researcher will personally access the data, and confidentiality will be maintained by signing this confidentiality agreement. Your answers may be reviewed by people responsible for ensuring that research is done properly, including the transcriber, external coder, and members of the Research Ethics Committee. Otherwise, records that identify you will only be available to people working on the study unless you permit others to see the records. Your anonymous data may be used for other purposes, e.g. research reports, journal articles, conference presentations, etc. Privacy will be protected in any publication of the information. A study report may be submitted for publication, but individual participants will not be identifiable in such a report. You may stop being in the study without any consequences if you cannot continue.

How will the information be stored and ultimately destroyed?

Hard copies of your answers will be stored for five years in a locked cupboard/filing cabinet in the study leader's office for future research or academic purposes. Electronic information will be stored on a password-protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. The hard-copied information will be shredded and disposed of in a suitable manner after the completion of the study.

How will the participant be informed of the findings/results of the study?

If you want to be informed of the final research findings, please contact Tinomudaishe Manyeruke at 0620585902 or 2020035362@ufs4life.ac.za. Should you have concerns about how the research has been conducted, you may contact the study leader (email: Nell@ufs.ac.za).

Thank you for taking the time to read this information sheet and for considering participation in this study.



Consent to participate in this study

I, the undersigned,

(participant's full names to be included), (the "Participant")
confirm that I voluntarily agree to participate in the research study referred to as the *Milestone Usability Evaluation* (the "Study") in relation to the Computer Information Systems Honours Degree and which Study is being conducted by Tinomudaishe Manyeruke (the "Researcher").

I, the undersigned Participant, further confirm that:

1. the Researcher has explained the nature, procedure, potential benefits and anticipated inconvenience of my participation in the Study;
2. I have read (or had explained to me) and understood the Study as explained in the attached information sheet;
3. I have had sufficient opportunity to ask questions and am prepared to participate in the Study;
4. I understand that my participation in the Study is entirely voluntary and that I am free to withdraw at any time without penalty (if applicable);
5. I voluntarily provide the UFS and the Researcher with my personal information and consent to the UFS and the Researcher collecting, disclosing and processing my personal information in order to conduct the Study and any related activities in relation thereto;
6. I hereby acknowledge and confirm that I understand the purpose for which the UFS and the Researcher may collect, store, use, delete, destroy, outsource, transfer or otherwise process, as the context and circumstances may require and as contemplated in terms of POPIA, my personal information as set out herein;
7. I am aware that the findings of the Study will be anonymously processed into a research report, journal publications and/or conference proceedings and that my personal information will be aggregated and deidentified at such stage;
8. I also give the UFS permission to share, without notification, the collected data with other researchers at the UFS or other Higher Education Institutions. This permission is dependent on the same principles of ethical research practices, anonymity/confidentiality, safekeeping of information, and other issues listed above applying.

I, the Participant, agree to the audio recording of the evaluation session:

Full Name of Participant: _____

Signature of Participant: _____ Date: _____

Full Name(s) of Researcher(s): _____

Signature of Researcher: _____ Date: _____



Appendix D – Pre-test Questionnaire



Milestone: Pre-test Questionnaire

Welcome to Milestones Pre-Questionnaire Page!

As you embark on your journey towards achieving your academic and personal goals, we invite you to take a moment to fill out this pre-questionnaire. This information will enable us to provide you with tailored resources and support that align with your unique needs as a university student.

Your honest and thoughtful responses will guide us in assisting you effectively. Feel free to answer the questions below.

2020035362@ufs4life.ac.za [Switch account](#) 

 Not shared

* Indicates required question

1. Please select your age group. *

18-20
 21-23
 24-26
 27-30

2. What is your major or field of study? *

Your answer

3. How would you rate your experience with using a computer? *

1 2 3 4 5

Very poor

Excellent

4. Do you set academic goals for yourself? *

Yes

No

5. Are you able to manage your assignments, test preparations, and daily tasks on *
a weekly basis throughout the academic period?

1 2 3 4 5

Never

Always

6. How do you review or measure your progress each day? *

Your answer

7. Do you currently use specific methods or tools to set and track your academic *
goals?

Yes

No

8. If you answered yes in the previous question, please specify what kind of method(s) you use.

Your answer

9. Do you face challenges when creating goals for yourself? *

- Yes
- No

10. If you answered yes in the previous question, please specify:

Your answer

Thank you for partaking in this questionnaire, your input is of much importance to us.

[Submit](#)

[Clear form](#)

Appendix E – Task sheet

Milestone Evaluation: Task sheet

Welcome to the Milestone Usability Test!

In this test, you will be asked to complete a series of tasks using the Milestone website. The goal is to evaluate how easy and intuitive the website is for setting and managing academic goals. Please complete each task to the best of your ability and let us know if you encounter any issues.

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Not shared

* Indicates required question

Task 1: Register for an Account

Instructions:

1. Navigate to the registration page using this link => [Milestone website](#).
2. Create a new account by clicking the 'Register' button.
3. Fill in your details and save your information.

Was the registration process straightforward? *

- Yes
 No

Did you encounter any difficulties while registering? *

- Yes
 No

Task 2: Log into your Account

Instructions:

1. Log in using the account you just created.

Was the login process intuitive? *

- Yes
 No

Did you encounter any issues with the login process? *

- Yes
 No

Task 3: Create a SMART Goal

Instructions:

1. Once logged in, navigate to 'My SMART goals'.
2. Create your own goal.
3. Save the goal.

Were the fields for creating a SMART goal clear and easy to understand? *

- Yes
 No

If not, kindly elaborate on why it was not easy to understand.

Your answer

Did you experience any problems saving the goal? *

- Yes
- No

Task 4: View Your SMART Goals

Instructions:

1. After creating your SMART goal, click the 'View details' button next to your goal to view the goal details you saved.
2. Click the 'Cancel' button.

Was it easy to find your goal list? *

- Yes
- No

Were the details of your SMART goal presented clearly? *

- Yes
- No

Did you have any trouble navigating this section? *

- Yes
- No
- Other: _____

Task 5: Update a SMART Goal

Instructions:

1. Select the 'Edit' button to update the SMART Goal you just created.
2. Make changes to one or more details.
3. Save your changes.

Was it easy to update the goal? *

- Yes
- No

Did the system save your changes correctly? *

- Yes
- No

Task 6: Mark SMART Goal as achieved.

Instructions:

1. Mark your SMART goal as achieved by ticking the checkbox.

Was the process of marking a goal as achieved easy to follow? *

- Yes
- No

Task 7: Delete a SMART Goal

Instructions:

1. Click the 'Delete' button to remove the SMART goal you created earlier.

Did the system ask for confirmation before deletion? *

- Yes
- No

Did the goal get deleted successfully? *

- Yes
- No

Task 8: Create a Task

Instructions:

1. Once logged in, navigate to 'My Tasks'.
2. Create your own task.
3. Save the task.

Were the fields for creating a task clear and easy to understand? *

- Yes
- No

Task 9: Mark tasks as complete

Instructions:

1. Mark your task as complete by ticking the checkbox.

Was the process of marking a task as complete easy to follow? *

- Yes
- No
- Other: _____

Task 10: Delete your task

Instructions:

1. Click the 'Delete' button to remove the task you created earlier.

Did the system ask for confirmation before deletion? *

- Yes
- No

Did the task get deleted successfully? *

- Yes
- No

Task 11: Add a Note in the Notebook

Instructions:

1. Navigate to the notebook section.
2. Click the 'Create note' button to your notebook.
3. Click the note you created that appeared to access each note you create.
4. Type on the note page a note of your choosing.
5. Save the note.

Was it easy to create and save the note? *

- Yes
- No

Did you have any trouble during this process? *

- Yes
- No

If so, please elaborate on why it was difficult.

Your answer

Task 12: View Your Achievements

Instructions:

1. Go to the section where you can view your achievements.
2. View your current progress toward earning badges.

Were the progress and achievements clearly displayed? *

- Yes
 No

Task 13: View Your Calendar

Instructions:

1. Navigate to the calendar section of the website.
2. View today's calendar and any tasks or goals.

Was the calendar easy to access and view? *

- Yes
 No

Task 14: Log Out of Your Account

Instructions:

1. Log out of the Milestone website by clicking the log out button or sign.

Was it easy to log out?*

- Yes
- No

[Next](#)

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Final questions

Overall, how easy was it to use the Milestone website?

1 2 3 4 5

Very difficult

Very easy

Did you encounter any bugs or difficulties during the test?

- Yes
- No

What features did you find most useful?

Your answer

What improvements would you suggest to make the website easier to use?

Your answer

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Appendix F – Observation Sheet

Milestone Evaluation: Observation Sheet

General Information:

- Tester Name: _____
- Date: _____

Section 1A: Registration

Observation Area	Criteria	Yes	No
Creating an account	Did the user successfully create a profile?		
Password validation	Is the user not getting stuck when creating a password?		
Log in	Can the user log in and open Milestones dashboard?		
Additional comments			

Section 1B: Goal Creation and Viewing

Observation Area	Criteria	Yes	No
Ease of Navigation	Does the user easily navigate to the goal creation section?		
SMART Goals Functionality	Is the user able to clearly understand creating goals?		
Viewing Goals	Does the user easily find and view goal details?		
Editing Goals	Is the user able to successfully edit an existing goal?		
Completion Marking	Can the user easily mark a goal as complete?		
Saving Goals	Is the user able to save a goal successfully?		
Goal Entry	Was the user able to clearly understand how to input goals?		
Additional comments			

Section 1C: Task Creation

Observation Area	Criteria	Yes	No
Ease of Navigation	Does the user easily navigate to the task creation section?		
Creating Tasks	Is the user able to create tasks?		
Task Completion	Can the user easily mark tasks as complete?		
Task Entry	Is the user able to clearly understand how to input tasks?		
Additional comments			

Section 1D: Notes and Additional Features

Observation Area	Criteria	Yes	No
Taking Notes	Can the user effectively add notes related to their goals/tasks?		
Notes Clarity	Are the notes easily accessible and readable?		
Editing Notes	Can the user easily edit and save notes?		
General Usability	Are the features of the platform intuitive and easy to use?		
User Satisfaction	Does the user seem satisfied with the platform's overall functionality?		
Additional comments			

Overall feedback:

Appendix G – Post-test Questionnaire



Milestone Evaluation: Post-test Questionnaire

Thank you for participating in our usability test for the Goal Setting Website! Your feedback is essential for improving our platform. Please take a moment to share your thoughts in this post-questionnaire. Your insights will help us enhance your goal-setting experience!

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Not shared

* Indicates required question

I think that I would like to use this website frequently. *

1 2 3 4 5

Strongly disagree

Strongly agree

I found this website easy to use. *

1 2 3 4 5

Strongly disagree

Strongly agree

I think that I would need support of a technical person to be able to use this system *

1 2 3 4 5

Strongly disagree

Strongly agree

I found the system unnecessarily complex. *

1 2 3 4 5

Strongly disagree

Strongly agree

I found the various functions in this system were well integrated. *

1 2 3 4 5

Strongly disagree

Strongly agree

I thought there was too much inconsistency in the system. *

1 2 3 4 5

Strongly disagree

Strongly agree

I would imagine that most people would learn to use this system very quickly. *

1 2 3 4 5

Strongly disagree

Strongly agree

I struggled to navigate through the website. *

1 2 3 4 5

Strongly disagree

Strongly agree

I felt very confident using the system. *

1 2 3 4 5

Strongly disagree

Strongly agree

I needed to learn a lot of things before I could get going with this system. *

1 2 3 4 5

Strongly disagree

Strongly agree

Submit

Clear form