College of Engineering and Information Technology

Information Technology Department

**Development and Evaluation of**

**AXION**

**An Automated Web-Based Task Management Tool for College Students**

For RESEARCH 1 – Methods in Research Computing

For the Degree of Bachelor of Science in Information Technology

December 12, 2021

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**CHAPTER 1**

**BACKGROUND OF THE STUDY**

A task is an objective that can be attained by putting effort into it. Whereas, the term ‘organizing’, is defined as a process that starts the implementation of plans by defining roles, establishing working relationships, and efficiently allocating resources to achieve the indicated and intended outcomes or goals. Moreover, task management is the practice of overseeing a task's progress throughout its life cycle, from planning to testing to tracking to reporting. And the application that is designed to support task management is called a task management tool. As students continue to do their academic responsibilities amidst the pandemic, it will be crucial for them to manage their resources for these responsibilities, since it can affect their academic performance. Using a task management tool can be an effective way for students, because it can support them with managing their tasks properly and work through their academic routine efficiently.

Since the start of the pandemic, students are engaged in studying and have plans to work on. They usually manage their tasks on their devices through different ways, like setting a reminder manually, writing it in a piece of paper, or even starting with tasks with the highest priorities or the closest to the due date. In other words, students have their own methods to effectively handle the tasks that they ought to undergo. It was also found out that, according to Adams (2019), the students’ perceived control of time was the factor that correlated significantly with cumulative point grade average. Together with the current situation amidst the pandemic, the students are spending most of their time isolated and stuck with using technology as an alternative for learning, where they are to rely on managing their tasks through different means, such as using management tools.

**STATEMENT OF THE PROBLEM**

This study focuses on the current problems that a student might face regarding their management on their academic-related tasks, since the students are currently working on blended learning as an alternative to continue their education amidst pandemic, thus their sense of independence is being challenged and this includes managing their own time and resources. Certain management struggles that every student might face along the way are: (1) poor management skills, which can trigger more struggles, (2) too much workload that it could overwhelm and pressure the students, (3) the conjunction of academic and non-academic activities, thus making decisions will become crucial, (4) uncertainty of the tasks, (5) procrastination, and (6) information overload. Such factors can negatively affect every students' efficiency and well-being, including their academic performance, and may even lead to unpleasant results, such as internal chaos and demotivation.

**GENERAL OBJECTIVE**

To design and develop Axion that aims to help students specifically with overcoming their management problems and improve their academic performance by managing their academic tasks efficiently. This can be done by defining the requirement needed to design and develop Axion, which is being evaluated from this study’s factors or variables.

**SPECIFIC OBJECTIVE [under revision sa last bullet]**

This study aims to fulfill the following objectives that are specified for designing and developing Axion in order to cover the said problems that the students are experiencing:

* To identify and assess the correlation of factors or variables that are included in this study, such as the students’ condition, practices, and struggles regarding the area of management.
* To have a sufficient foundation of knowledge and data that are gathered from the factors or variables and evaluated to be used as a requirement for designing and developing Axion.
* To design and develop Axion to meet the following targets:
  + To make the system of Axion easy to adapt and comprehend for the students.
  + To hone the students’ knowledge and skills about management as they use Axion.
  + To be capable in supporting students on achieving better academic performance.
* To execute Axion through user testing in order to get feedback for improvement of its system.
* To execute Axion through user testing in order to get feedback for the improvement of its system until it is finalized to work on its own without maintenance.

**PURPOSE AND DESCRIPTION [under revision malapit na]**

This study broadly shows the purpose of Axion in helping students to successfully organize their academic-related tasks and make sure that these tasks would be able to go along well with their daily lifestyle. Also, students will be able to determine which tasks are important, not important, urgent, and non-urgent, and which should be prioritized first up to the last task. Due to this, students can produce sufficient performance to their work, encouraging them to exert their potential to become more productive. Then, it can result in investing more free time on other things that can either be related to academics or not, and achieving their academic goals. Positively boosting their well-being is also an expected implication, since the feeling of being successful, as discussed by Connors (2018), can stimulate positive feelings, such as happiness, confidence, and contentment. This study can also be a source of information that future researchers can use as support for their own studies. The beneficiaries for this study will be:

* College students - which are the focus for this study

The result of the study will be a great benefit to the students in general. This study can be a learning paradigm on: (1) how students can perform better at managing their tasks, workflows in academic and non-academic tasks, and better grades or academic performance, (2) to also avoid the most problematic hindrances when managing tasks, such as procrastination and demotivation, and (3) to help improve the students' academic competence and develop their managing skills on their own, which will aid them on managing their work resources in the future once they will be employed.

benefirciaries:

students - better management

teachers - knowledge tutulong sa kung ano dapat gawin nila

future researchers - source of information

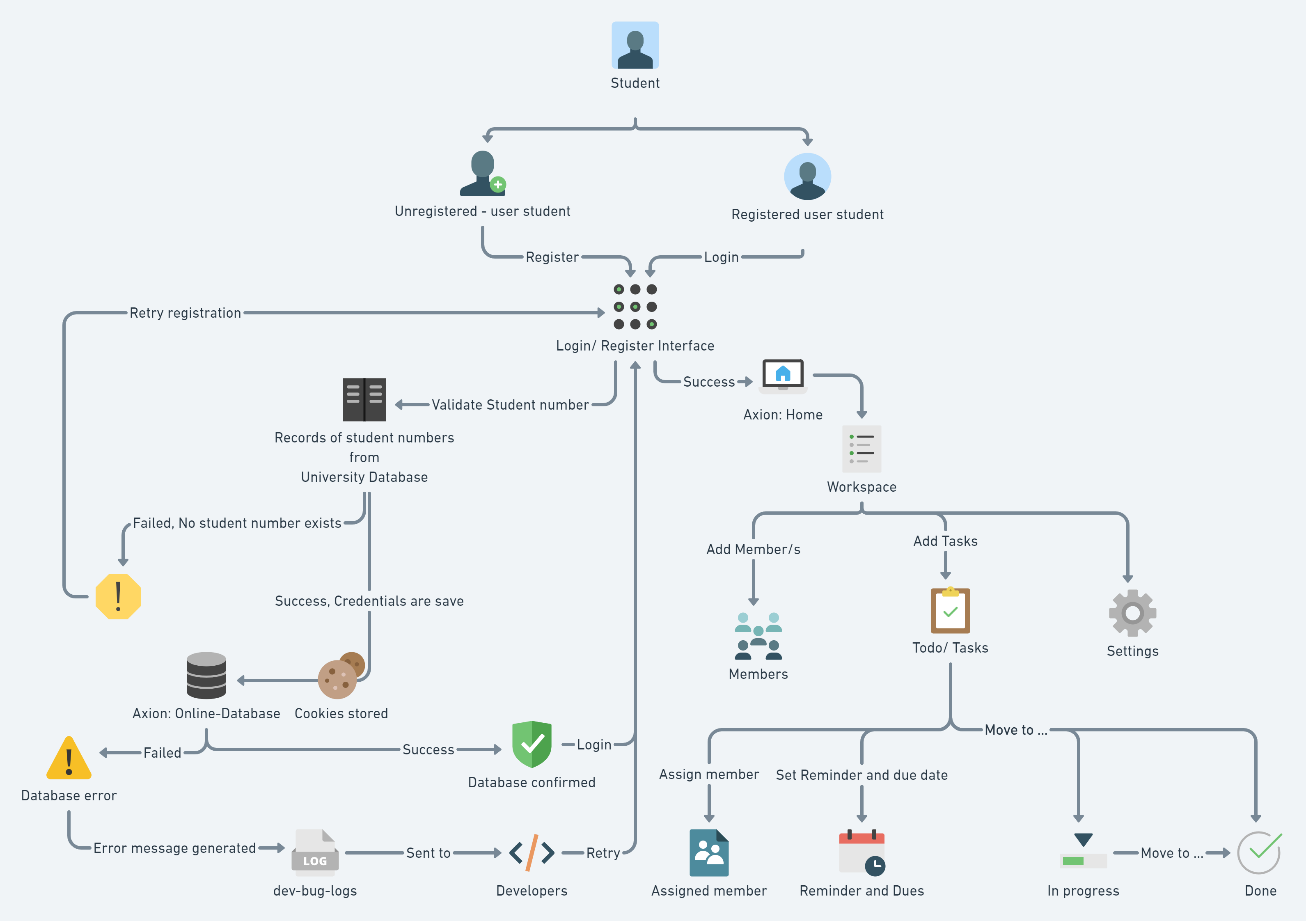
**SCOPE AND LIMITATION [under revision]**

The basis of this study is to acquire the benefits of management, such as submitting work on time and obtaining productivity, wherein academic performance will be directly and positively affected by it and the progression of achieving academic goals will be ensured. Therefore, the best scope for this study, out of all the students in different grade levels, would be the college students, specifically those that are liable to have more tasks to work on. () have stated that college students are emerging into adulthood, which means that their independence and maturation are being prepared before they finish their education. In addition, according to (), college students are very likely to have more freedom to make day-to-day decisions that will support the path that they have chosen and help them achieve their academic goals. By that, they are expected to become capable of handling and managing their tasks on their own. The researchers are able to understand the environment of college students, since they are also in the same occupation and circumstances as them. This means that Axion has to become befitting to the uniform standards of college students to be able to provide benefits to the researchers as well. The specifications of Axion will involve setting each component to give a welcoming atmosphere for the students as the end users. Such specifications include the ability of the students to collaborate which supports data synchronization and is specifically for group activities or projects. Personal workspaces will also be implemented for the individual tasks of the students. Axion has its unique and attractive user interface, along with the system striving to become easy to comprehend for students. Tasks can be differentiated through its due date, priority, and details before it is created to avoid uncertainty. It can also be marked as a favorite in order so that it can be quickly accessed by the students. A login authentication will also be added, in which the credentials of the user accounts will be stored.

Since college students are expected to use management tools to rearrange their tasks, students in the other grade levels, specifically in the secondary level, who are able to use the same tool should be considered. The researchers still find college students to be more befitting to the parameters of this study, thus secondary level will not be included. Another is that some of the college students may not find Axion interesting or become compatible with it. Despite that, Axion still aims to become uniformly acceptable for students, where they can easily adapt to the system and give out its full potential as a task management tool. With regards to Axion being web-based, implementing push notifications will not be included. Axion would not be doing any encouragement, so it will be up to the students to keep track of their current tasks manually. Internet connection will be required for Axion to work since it is a web-based application and also for data synchronization to work which will be needed for collaboration. Unable to have access to an internet connection would mean Axion will not work, therefore, it can be a hindrance. Axion will also be having limited communication during collaboration. Students are only able to interact through updating statuses, adding details or description, and commenting on other members’ tasks(?). Students will hold the responsibility to keep track of tasks, because Axion can only support students towards management. Therefore, if students did not devote themselves to manage their tasks, they would not be able to give out its potential as a task management tool. Even if they do so, the benefits of Axion will not be guaranteed to offer students the absolute solutions that will answer every problem there is for their management-related problems, for it only serves to aid them with their academic tasks.

**CONCEPTUAL FRAMEWORK [gagawing IPO]**

The following diagram describes the flow and process of the web application in different user-students state, the diagram is presented below.

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The diagram starts at the ‘student’ located at the very top part, wherein he/she is either registered or unregistered to Axion. Unregistered users-students must register first in the web application and validate their credentials. If the credentials exist in the records within the university’s database, the credentials will then be saved and stored into Axion’s online database. Failure to find the credentials will lead to the registration being cancelled and the web application will attempt to register the users-students again. If it returns with an error, the web application will handle it by sending a message or logs to the developer, in order for it to be fixed on the next patch. The web application should move back to the login screen. For the registered users-students, after logging in, they will automatically have one workspace where they can add or create to-do notes or tasks, with the workspaces being similar to projects. Registered users-students are unable to register another account if they have one existing. They can add members to their own workspaces, and access the settings and other features of the web application. With the tasks being created, registered users-students can assign members on tasks. They are able to set a reminder and due date and time in the built-in calendar, and move tasks into the ‘in-progress’ board, which will then move to the ‘completed’ or ‘done’ board once a task has been completed. For some instances, if the users-students have wrongly provided their credentials three times and failed to log in because of a wrong password or is unable to find their credentials, the web application will refresh the login interface to let the users-students retry logging in their correct credentials.

**DEFINITION OF TERMS [revision]**

**Kanban -** is a visual board or system originating from Japan that helps with schedules and track tasks as it moves through a process.

**Organizing** - is one of the most important functions of management since it focuses on efficiently allocating and organizing people and other financial resources to carry out the organization's strategies. It also includes developing, maintaining, and managing working relationships, which requires planning and a variety of methods for completing those tasks.

**Planning** - The primary job of management is planning. It is a blueprint for the activities that will be carried out to achieve set objectives in the future. It entails planning forward and laying out a strategy for the future.

**Productivity -** is the capability of one or more individuals to produce goods and services efficiently.

**Productivity Management Software (PMS) -** are programs designed to help individuals manage tasks and achieve productivity.

**Project -** is a series of related tasks that is carefully planned by an individual or a group of people to achieve a certain objective.

**Task** - A task is a single work unit — one stage in a multi-phase project. A task must be completed by a specific deadline and contribute to the achievement of work-related goals.

**Task Management** - is a process in which a person or a group of people keeps track of a task throughout its life cycle and makes choices based on the results. Task management is accomplished by the use of software solutions that assist in the successful organization and administration of tasks through features such as task creation, planning and assignment, tracking, and reporting.

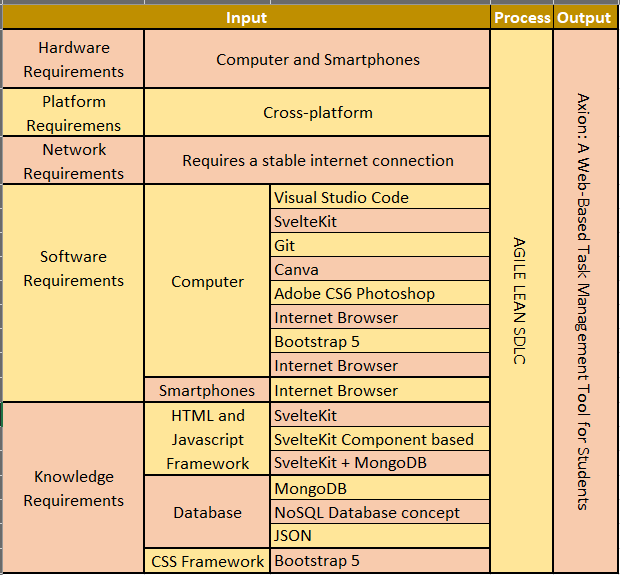
**Task Management Tool** - is a tool being managed by one or more individuals to put order on their tasks. Task management tools have features and accessibilities that helps users with their management.

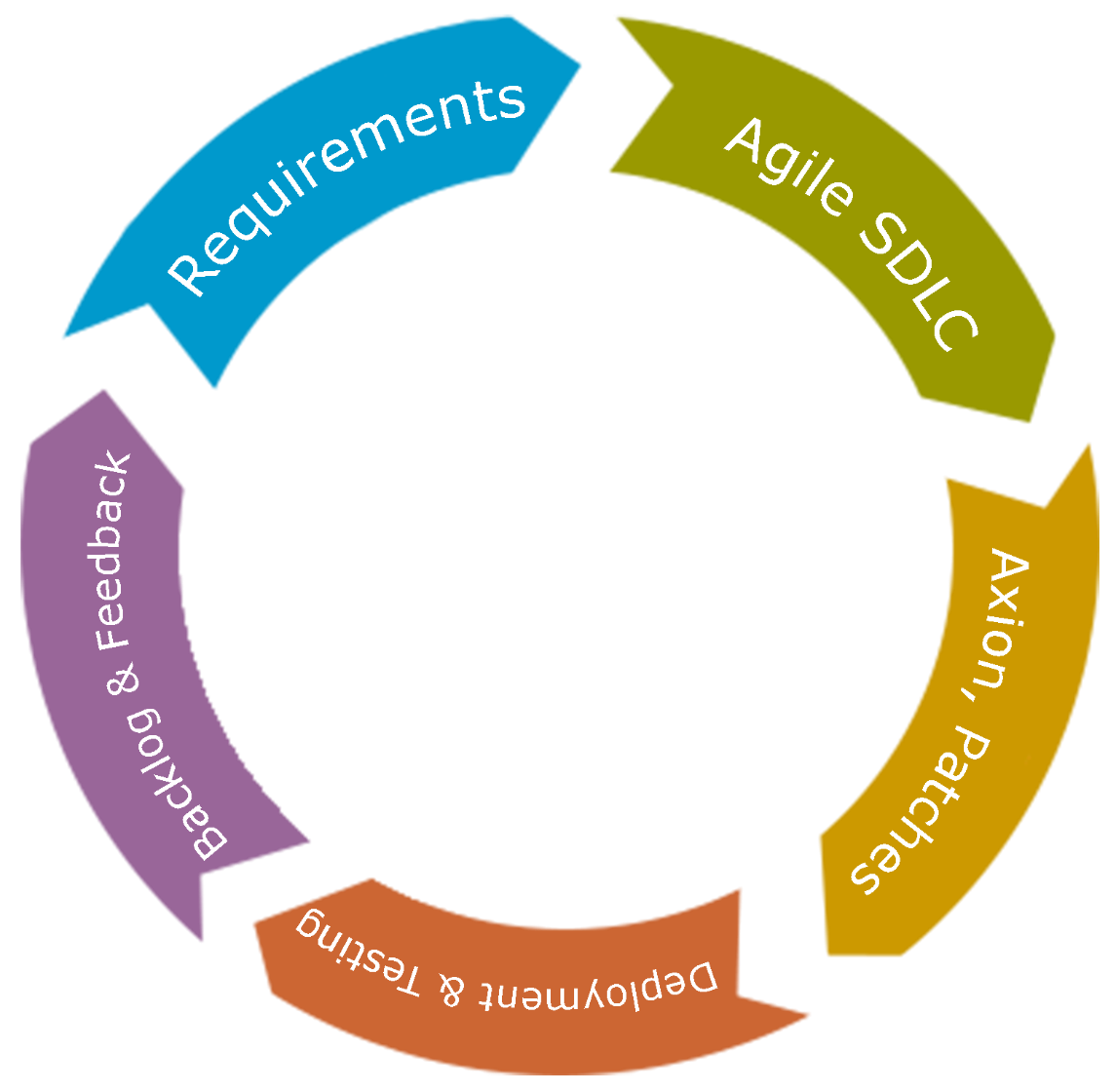
**Task Status -** is the current progress of a task.

**Task Views** - are different ways to visualize your tasks (e.g. Kanban, Gantt Chart, Calendar)

**Web Application -** is a computer program that makes use of web technology, performs a specific purpose and is displayed over the Internet.

**CONCEPTUAL FRAMEWRORK**





**CHAPTER 2**

**TECHNICAL BACKGROUND [revision]**

Workspaces are seen, especially in enterprises, as an area to keep boards that are related to the same topic or workflow together, or even to keep all the important things for the same team and people, regardless of the subject. Workspaces provide a useful way to see boards and collaborate with all your team members in one place. Web is the area where users are able to visit through the Internet using a browser. A web browser is frequently used to execute web-based applications, which are software that is accessible through the Web over a network connection rather than being stored in memory on a device. Web-based applications can also be client-based, in which a tiny portion of the software is downloaded to the user's desktop but processing is done on an external server through the internet. The user interface (UI) is where users naturally interact with a system. The calendar system provides enterprise workspaces with a powerful visual approach to track and manage their cards, as well as their due dates and start dates. The calendar view provides users with the perspective that users need to arrange and prioritize tasks for the coming days, weeks, and months. A board is the central hub of the workplace, and it may hold any number of lists and cards. A list is a column that includes cards. It's to the users and their project's needs how they utilize and arrange lists. Each list, for example, may represent a team member, and the board would keep track of everyone's responsibilities. Alternatively, a user may set up the list as a workflow, with each card moving from one list to the next as tasks are processed and finished. Cards are the smallest units, which are used to identify tasks that must be completed. The card not only has a name, but can also contain file attachments, images, notes, and other information once being opened. If necessary, users can also make a card template that includes standard information, such as a team checklist. Cards can be opened and edited with a single click, and dragging and dropping cards between lists are as simple as dragging and dropping, allowing new users to get up and running quickly.

**FOREIGN LITERATURE [revision?]**

Lynn (n.d) has claimed that project or task management tools have key components that can surely make lives and works of its clients easier starting with prioritization. Organizing in accordance to prioritize your tasks such that the most critical tasks are accomplished first, telling that the users can focus on how work should be approached by prioritizing tasks rather than bouncing from one item to another without direction. Second is visualization, it helps users better understand a project as a whole and dependencies become evident and collaboration becomes natural when everything is spelled out in an easy-to-understand manner. Lastly, analysis as the project or task management software provides accomplishments. This reflects that the team or manager can analyze it and use it to have another form of management. According to a NTaskManager website’s blog (2021) a project management software is a system that combines a variety of useful features and modules into a single platform to help anyone who needs to organize and plan their professional or personal tasks. Clients that use project management tools allow users to stay connected and manage roles and responsibilities at their project or tasks. On the contrary, Faust (2018) has pointed out on their blog’s post that project management software is over complicated and the reasons are because of highly customizable project management software it makes the project to have a complex control leaving out the software to be harder to adopt, implemented, learn and use another one is most of the companies making these project management software makes it size one fits’ all, giving every single feature that can be added to it making the project management software challenging to learn because of its broad and bloated features. Project management process includes time management, which, according to IceHrm's blog article, is defined as "time management in the manner you plan and organize your particular tasks and work." In addition, IceHrm (2021) stated that time management has advantages and here are some of the following advantages: no waste of time, less friction and problems and spend your time on other things. On the other hand, IceHrm (2021) blog’s article second part says if not able to do it right then a person may suffer to its disadvantages like putting on too much weight on himself, procrastination, multitasking and being unable to prioritize.

**LOCAL LITERATURE [revision]**

Task management is deemed very important especially to the students because it helps them become more productive. According to Exforsys (2010), managing tasks reduces the time allotted for setting priorities and encourages the student to make use of the art of delegation. The study shows that making own to-do list daily makes the person can be more productive around 20%. Having a to-do list you can clear your mind of unnecessary worries brought about by thinking of how you can finish every task on designated time. The list will serve as guide in managing especially student's academic tasks and can also help to determine the four kinds of individual tasks which are urgent and important, not urgent but important, urgent but not important, and not urgent and not important.

Time management can be a good partner of task management. O'Connell (2014) states that having balance between sleep, exercise, and appropriate diet alongside an increase in “downtime” would lead to a decrease in anxiety and stress, therefore suggesting the link between time management and physical health.

**FOREIGN STUDIES**

Sundström and Thelander (2004) have discussed that many potential users that are unfamiliar with technology are to be critically expected. According to Juul & Norton (2017) in their study related to game systems and interfaces, newly introduced users or players may be able to perceive and interpret the objectives of games as simple and feasible. But, it can be disrupted and framed with inefficiency due to the interface and rules that are being set in the game to constrain players in achieving maximum control during gameplay. In other words, as added by Juul & Norton (2017) that conversely, it is natural for software systems to be difficult. Therefore, the users, whether they are still new and unfamiliar with technology or not, must find the user interface of the application that they are using to be intuitive, pleasant, and easy to understand. Ramrathan and Sibanda (2017) have supported that a comprehensible interface can greatly guide user intuition as users will be primed to analyze and adapt to the kind of system environment that they will be controlling. Otherwise, the system will be wasting its potential. Sundström and Thelander (2004) have also mentioned that focusing on the perspective of the target audience regarding the user interface of a task management tool will greatly enhance its quality and effectiveness. This also means that any visual components, even texts, that are included in a management tool should be seen and viewed by users without difficulty.

Farwell and Waters (2010) have referred in their study regarding favorites or bookmarks, which is also similar for Abrams, Baecker, & Chignell (1998), that in an educational setting, favorites or bookmarks, as an easily accessible collection of information that can be important or interesting to a certain student are capable of providing learning opportunities, improving learning experiences, promoting accuracy of information, and reinforcing learning objectives. However, as finalized by Bergman, Whittaker, and Schooler (2021) in their study that the bookmarks may not become capable as said, if they are not visible to the users. Grosseck (2008) has also stated that it can become an obstacle for the users, possibly causing them information overload due to having a huge amount of sources that may have been abandoned and unvisited. This can mean that students are to carefully handle their favorites section in a way that they should also recognize its use.

As for setting priorities to tasks, Bahadori, Salesi, Ravangard, Hosseini, Raadabadi, Dana, and Ameryoun (2015) have recommended that an individual should be required to have sufficient knowledge regarding his or her current situation towards his or her responsibilities in order to plan and arrange their tasks accurately and properly, starting with the activities that are most urgent and important. Due to this, the improvement of managing time and resources in a proper manner can be achieved. This can also be relevant for college students which is stated by Britton and Tesser (1991), since their methods or practices towards management may influence their academic achievements in college.

**LOCAL STUDIES [aayusin]**

Lualhati (2019) has analyzed in her study that most of the teachers, as the study’s respondents, are found to be well-organized, productive, and content with their work. Furthermore, the respondents stick to their own effective way or system of managing tasks to commit to their responsibilities, which leads to them being able to sense empowerment and appreciate the simple pleasures of life. With that being said, the researchers of this study intend to comply with the system of Axion to the general standards of students. This will include showing specific terms regarding studies that the students already know. Both the study of Barrot et al. (2021) and Rotas and Cahapay (2020) have stated that the students have repetitive struggles that they are continuously facing, especially amidst pandemic, such as having a poor learning environment. While some are unavoidable due to having limited resources and such, there will be cases where a management tool can be able to cover, aiding students as they face the said struggles, which strives to make them have more self-control and feel more psychologically empowered.

**FOREIGN SYSTEMS [ilalagay system pics -** [FOREIGN SYSTEMS (updated with pic ccaption).docx](<https://height-files.storage.googleapis.com/c37c83ce-6420-48f9-b92b-a3f084609cbc.docx>)]

Andriiuk (n.d.) and Kashyap (2021) have included in their lists the following systems that are related to the system of Axion:

ProofHub gives teams a centralized location to collaborate and complete projects. Besides online collaboration, ProofHub contains capabilities for improved communication, visibility, progress monitoring, and accountability.

Fusioo keeps track of a team's progress uniquely. It is favorable for small businesses to get organized because it lets them publish an online database in a short period of time and manage projects, clients, ideas, and timesheets in one certain location. Fusioo allows users to connect with both internal and external audiences within a secure system.

Wrike has collaboration and information management capabilities. It provides end-to-end project solutions, making and managing projects in a simple manner. Its task management and customization capabilities may help a team grow progressively.

Asana includes several features that can assist teams in managing tasks, information, and procedures. Asana is widely used by small firms and it effectively makes team collaboration convenient.

Basecamp is a collaboration and workstream platform and it is also a project management tool. It also incorporates a message board, real-time group chat, and other collaboration capabilities.

Monday has many options regarding task management views, including a Kanban board, a list, a map, and a spreadsheet. Another appreciated feature is their reporting tool, which will make it easier for a team of users to keep track of their project's progress.

Paymo assists users with resource scheduling, time tracking, project planning, accounting, file proofreading, and team collaboration. Users may create projects, check their progress using the time tracking tool, and manage their workflow using various task views such as Gantt charts, lists, tables, and Kanban boards.

Teamwork can be a good option to manage tasks, but it can also become sophisticated to users. Workload and portfolio management, time tracking, reporting dashboards, board view, and Gantt charts are what Teamwork can provide. It will allow users to manage many complex projects at the same time.

ClickUp lets users plan, schedule, and manage their projects through Kanban boards. It will allow them to access a broader range of tools, such as Gantt charts and timeframes. To improve teamwork, users may plan tasks, subtasks, and even talk with their collaboration.

QuickBase enables users to build more efficient methods of working. It facilitates communication by providing a platform for hundreds of team members, colleagues, and clients to interact and achieve productivity. Because QuickBase is a collection of programs, it is considerably adaptable and can be utilized through different means.

**SYNTHESIS [aayusin]**

By knowing the potential of task management tools, these can be included in the recommendations for certain users, whether for students, companies, and those who desire to put order on their tasks. On the other hand, according to Faust (2018), task management tools with high functionalities and features tend to be more complex due to having a wider area for the users to control, which would likely make the users feel confused and overwhelmed. The users may find it more difficult to adapt to the whole system, possibly affecting their productivity in a negative way, and lessening the capabilities to plan, learn, and use. Therefore, having a brief map of the system may reduce the time being spent by users on learning it, but it shouldn’t affect the specific objective of the system. In another statement by Lynn (n.d) that having effective resources can make the users work rationally and gain more success. It would be significant for a task management tool to indicate its specifications that strive to achieve a unique objective, so that users can know what it will be for and how it should be used.

ProofHub, Fusioo, Wrike, Asana, Basecamp, Monday, Paymo, Teamwork, ClickUp, and Quickbase are the following management tool systems that are considerably related to Axion. The said related systems share the similar user interface, system structure, and objective. As discussed by (Esmeria & Seva, 2017), the user interface is considerably one of the most crucial components for any application, since it heavily displays how effective systems are. The contemporary, minimalistic system design is used by the related systems, since it indicates consistency and modernness. As for Axion, the researchers intend to make the user interface of Axion more perceptive by exhibiting more color and fun-looking fonts. Sundström and Thelander (2004) considers that there would be potential users, which can be students within the secondary year level or less, that are still familiarizing themselves with technology as an academic tool. Axion would be capable of welcoming them through its system design. This feature is what makes Axion mainly unique than the said related systems, which appears to impress higher occupations. Additionally, the researchers aim to provide a semi-casual voice and tone to static texts not only to match the user interface, but also to let the students keep the formalities during their usage.

Another specific feature of Axion is the management system that is developed for users to find it comprehensible, intuitive, and quick to grasp. This is considerably included, for students may find it complicated to control an entire system of the management tool. Being followed by Coursaris & Kim (2011), it might create a gap between the complexity of the system and the interaction of users to it. Axion has features similarly to other related systems, but it specifically aims to focus on what students can work on within its system.

Favorites, which can also be referred to as bookmarks, are implemented in the system to offer students the ability to have faster access to tasks that they have marked, reducing their effort to look for them. Although some of the related systems of Axion have already featured a favorites or bookmark feature, the researchers consider to be more specific with it by covering elements from both individual and group workspaces, whether it can be a board, task, or a subtask.

Priorities are also included in most of the related systems, yet only a few emphasize the tasks with the highest priority. In Axion, a Kanban system will be mainly used by students and to highlight the tasks that need the most attention, Axion automatically sorts any tasks on a desired board from top to bottom, starting with the highest priorities at the top and the lowest priorities at the bottom. Supposing that the users’ reading order is from top to bottom, they’ll be able to see the tasks with the highest priority first. This is also to assert recognizability, stimulating the idea of proper prioritization to students.

**TABLE OF COMPARISON**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| System features | **ProofHub** | **Fusioo** | **Wrike** | **Asana** | **Basecamp** | **Monday** | **Paymo** | **Teamwork** | **ClickUp** | **QuickBase** |
| User-friendly, visually unique GUI | No | No | No | Yes | No | Yes | No | No | Yes | No |
| Easy-to-learn management system | No | Yes | Yes | No | Yes | No | Yes | No | No | No |
| Favorites | Yes | No | Yes | Yes | No | Yes | No | No | No | No |
| Sorting and emphasizing high-priority tasks | No | No | Yes | Yes | No | Yes | No | No | No | Yes |

**APPENDICES**

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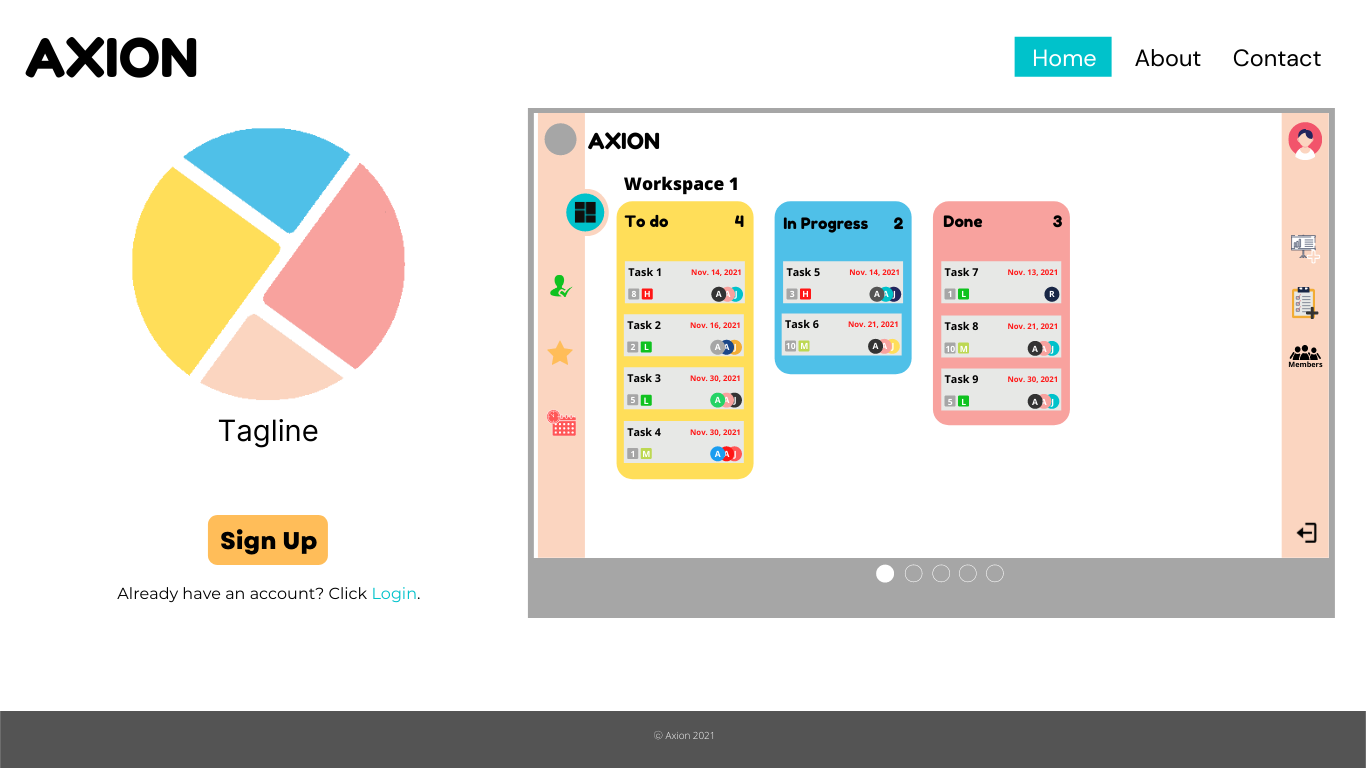
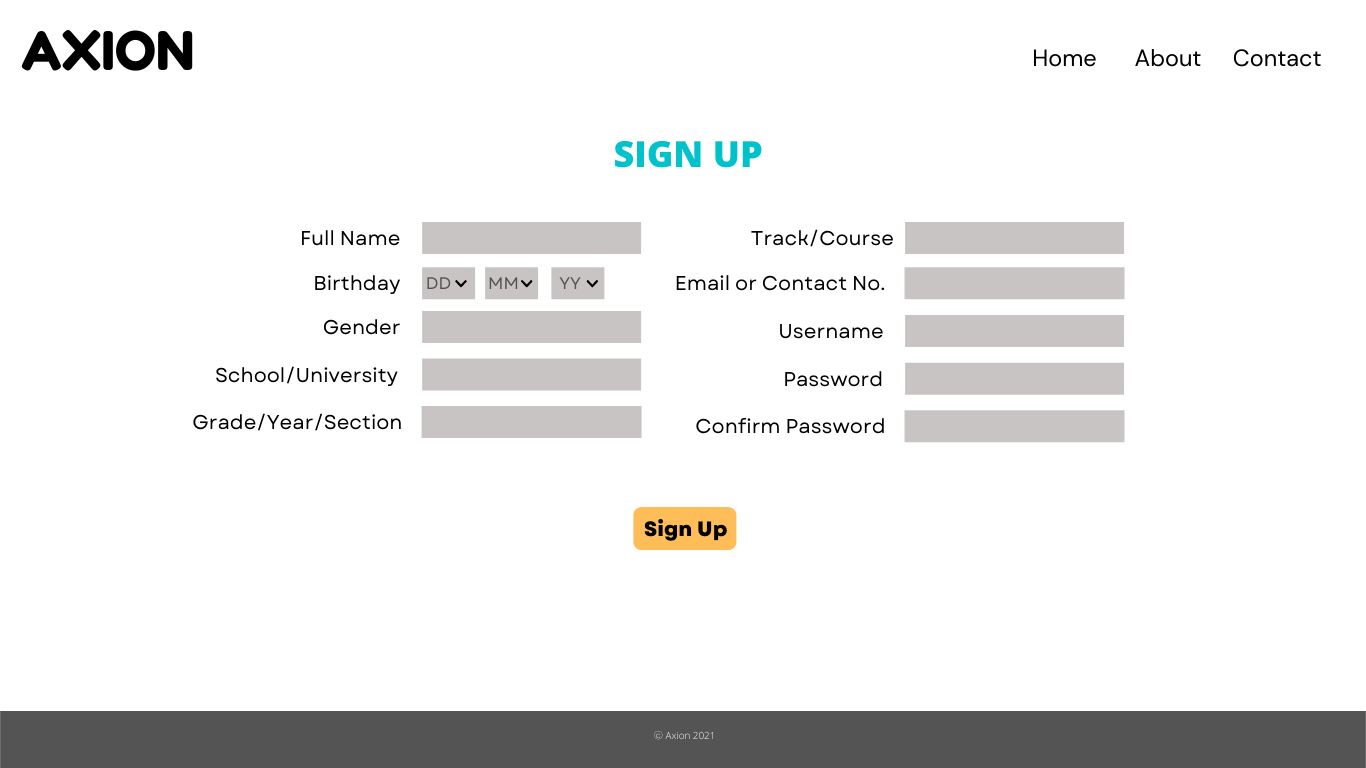
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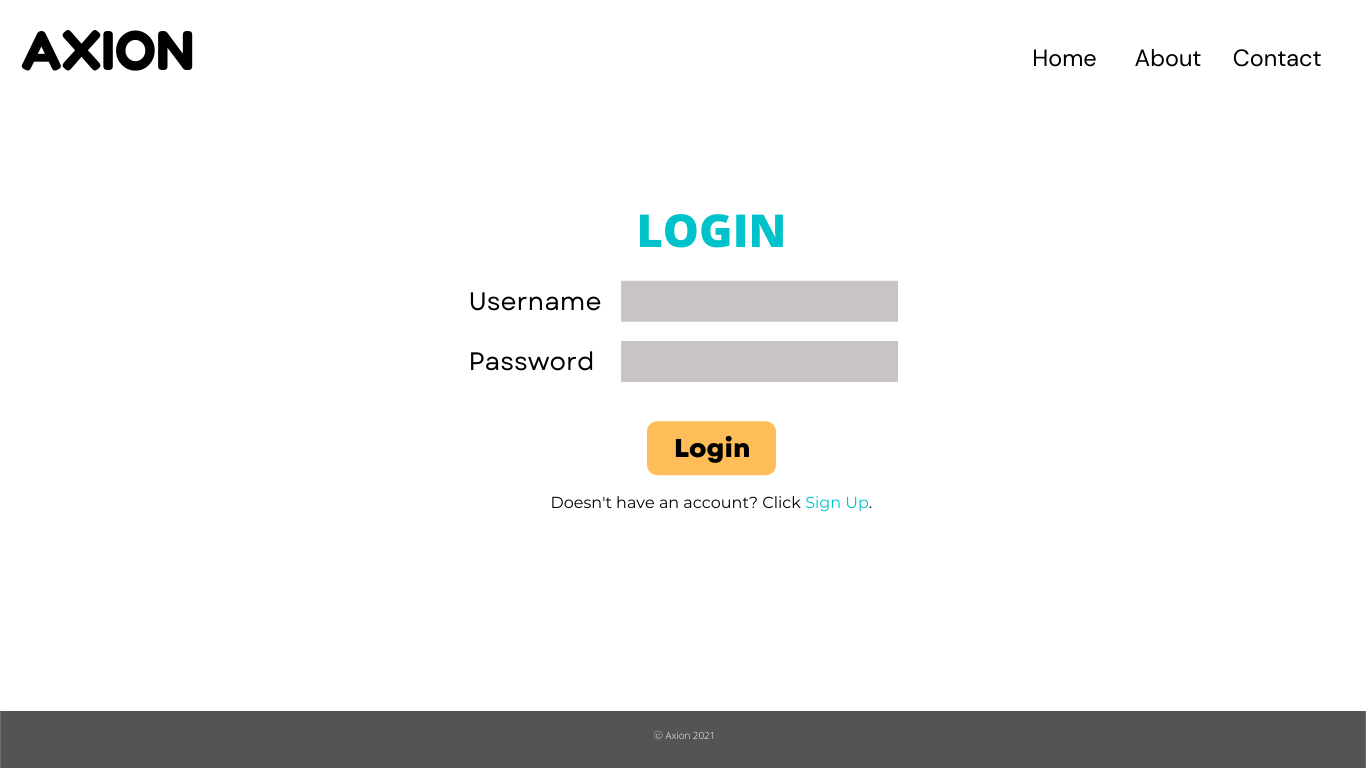
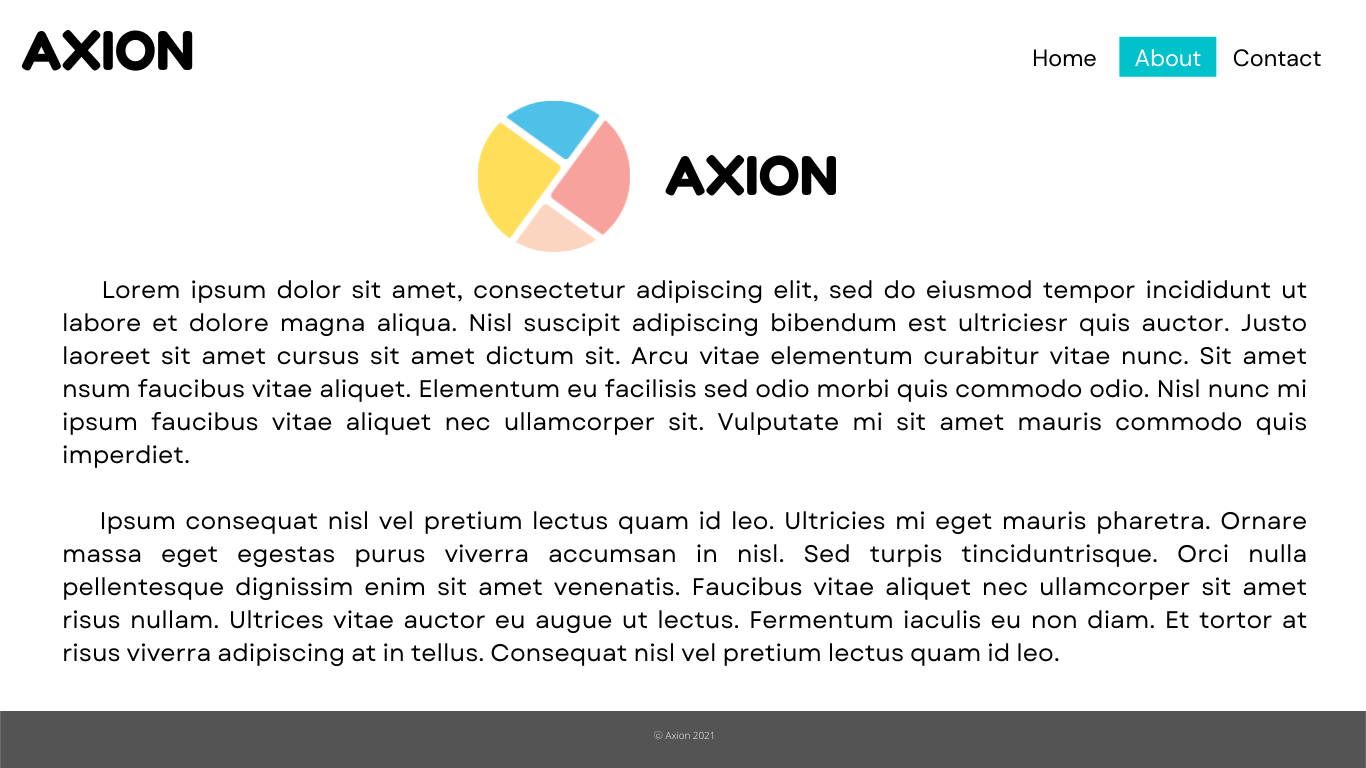
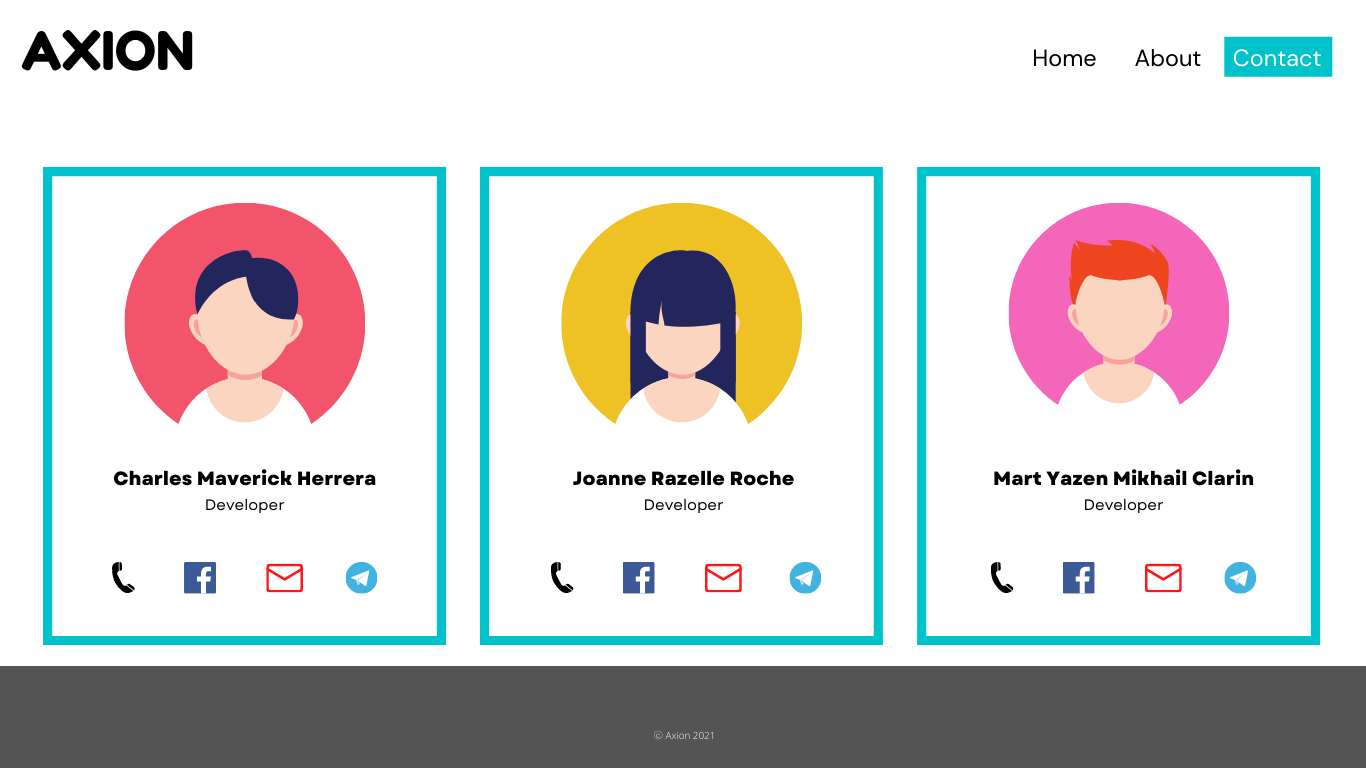
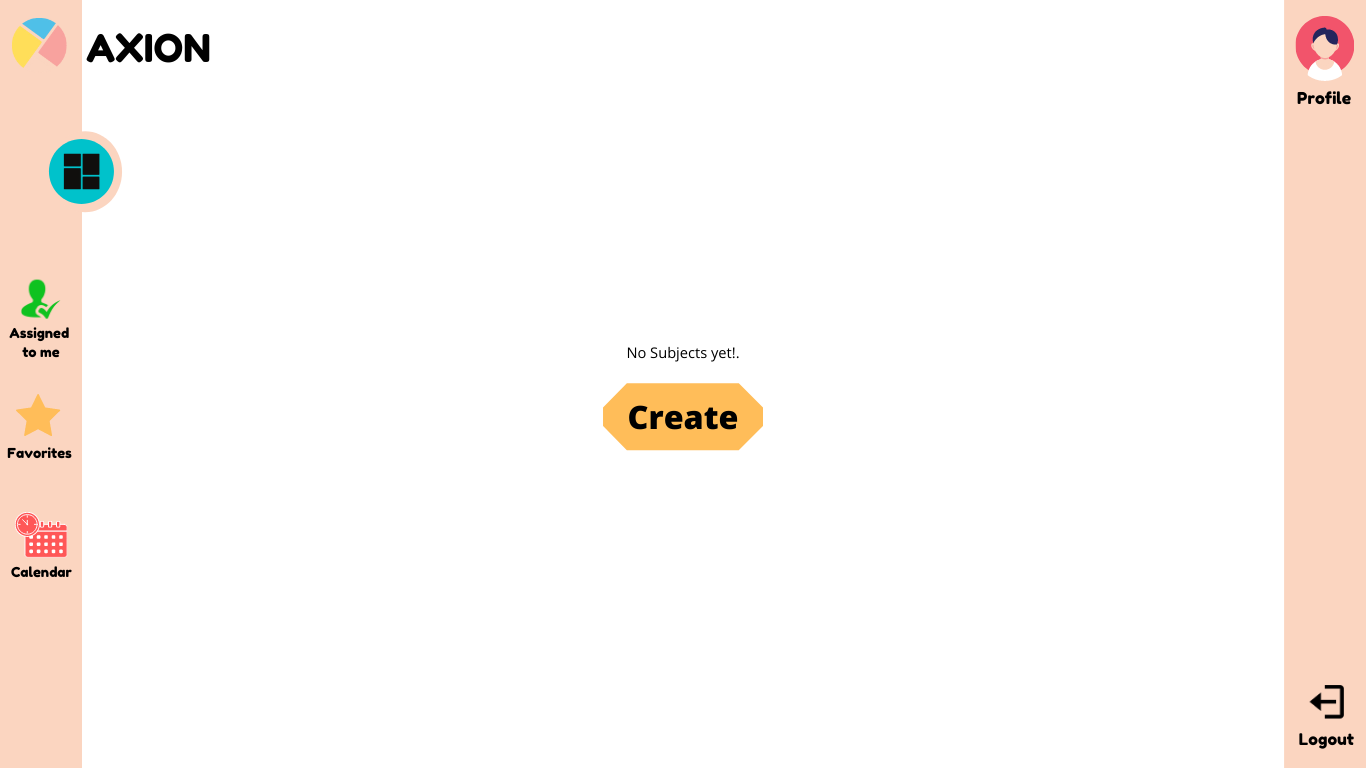
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The landing page of Axion for the first time visit of the user or visitor. Landing page highlights the Sign Up button with warm yellow-orange color for easy to catch the eye of the visitor attempting them to try and sign up in the Axion else if the visitor already has an account he/she can log in already by clicking the Login keyword below the Sign Up button. Additionally, has a carousel on the right side for the overview of what could be the Axion inside of the web-application. With three (3) navigation menu “Home”, “About” and “Contact” are a pages for each small website or introductory about the Axion and its developers which mainly can be contacted via the information provided in the Contacts page.

For the first time to use or new users who will sign up to use the Axion this page gets information from the soon to be user of Axion or the visitor. This information will be then encrypted especially the credentials to be used to login to avoid any data leak and personal identity thief cases, this will be then uploaded and recorded in the Axion’s online database where all the information are stored.If the user has already an account the website will automatically going to the login page for the ease of the user to login on the Axion. This page requires the credentials to login in which the password will be seen as asterisk or “password-text” style to avoid others to see the actual password. If the one who is using the device to access the Axion, Login page has the Sign up link below the Login button for them to directly go to the page of the Sign up. Axion website’s About page is all about telling what is Axion and what are its features and the reason why is there such system like this. More of this will be tackled and discussed by the developers.Axion website’s Contact page, contains the contact information of the developers.Given that the new user and refreshing old users who deleted all subjects this is the screen or page that they will see. Big button for the Create that attempts for the user to create a new subject that they will work on with their members added.