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Article

Student Academic Planner System: A Review

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***Abstract*— In this research, the target user of UniPlanner: Student Academic Planner will be focused on USIM students. It is a system used to help student manage their time. The purpose of developing this system is to maximize and improve the time management of USIM students, organize their daily life and increase the effectiveness of their studies. The description of the problem to be solved, how the system works, the methodology, and the tools used in the development will be discussed in this paper. Overall, this system will include with calendar, planner, notes, watch and timer, and CGPA calculator. These functions can lead to the betterment of student performances in academics.**

***Keywords*—** Planning, Time Planning, Time Management, Planner, Organize, Learning

I. INTRODUCTION

In March 2020, the World Health Organization (WHO) declared a pandemic situation with the spread of a new type of coronavirus that caused the outbreak of COVID-19 [1]. In line with this epidemic declaration, all countries have closed all sectors. The education system is one of the areas severely affected by the COVID-19 pandemic nationwide [2]. The closure of the education department led to the closure of all schools and universities to break the chain of transmission of this dangerous epidemic. As a result, the ancient face-to-face teaching and learning process had to be stopped and replaced with online learning also known as e-learning [3]. In the critical situation of the outbreak of COVID-19, the transition to online learning was the only one [4]. As e-learning is being practiced in student life these days, some students have difficulty managing their time properly between family, studies, and entertainment resulting in substantial disruptions in learning [5]. Students can easily slip right on the assignment or project deadline without being noticed. Based on these issues, the researcher decided to develop a system named UniPlanner which will help students to solve their time management problems while increasing the effectiveness of their studies and productivity.

Among the problems that arise from the implementation of new teaching and learning processes which is e-learning is that students have poor management of time. According to [2], time management consisted of several indicators. Activities such as time productivity planning, organization, mobilization, and control are time management efforts. At the beginning of the virtual learning period, students spend more time at home, causing them to be poor at spending time with family, entertainment, and education. Balancing studies with the fun

stuff in life can be challenging to maintain [5]. This unfamiliar learning method and poor time planning cause many students unconsciously miss classes that are conducted virtually or have insufficient time to complete the assignments given because they miss or forget the deadline. When students have too many assignments, students also tend to have trouble determining and completing assignments according to the priority deadline. To add to this, students had to be more independent and disciplined in their learning process as the physical presence and direct supervision of their educators were not possible [6].

Other than that, a student's academic performance is measured using the Cumulative Grade Average (CGPA). CGPA calculates the overall average of student coursework for all assignments and examination grades for all semesters throughout the study at the university [7]. Since students rely heavily on the CGPA exam results issued by the university, academic performance and learning outcomes in the new semester depend a lot on previous achievements. Thus, it can make it difficult for students to plan their studies to achieve their targets and if students do not know how to calculate examination results, they may not be good at planning to score in certain subjects.

Next, in the existing planner system, the reminder features function by sending email notifications. For students who regularly receive emails, it can cause them to miss reading the email and cause them not to be alerted by the due date. According to [8], the reminder features are designed to help people to remember future tasks that they might otherwise forget. At a minimum, the reminder features should include the types of tasks, task description, the date and time the reminder was created, and the time between the reminder and the notification creation.

Finally, some students are too focused on learning and chasing the deadline causing them to have health problems because they do not wisely divide their time accordingly and spend long hours in a sitting position with supine bent forward while using electronic devices [9] where they study too often without resting or enjoying the entertainment. Although this is good for their academic achievement, it is not good for their mental and physical health.

The following are the research questions of the research: (1) What are the gaps in the existing student academic planner for USIM students? (2) How to ensure the student academic planner, UniPlanner is protected from any threat? and (3) How to ensure the secured UniPlanner is working?

The research objectives of the research are as follows: (1) To investigate the gaps in the existing student academic planner for USIM students, (2) To develop a student academic planner UniPlanner that has a security feature, and (3) To conduct a user acceptance test to ensure the UniPlanner is working.

Web-based applications use web browsers and web technologies such as JavaScript, CSS, and HTML to provide one or more features to browser clients over the network [10]. Web-based applications make it easy for system users to update data as it is stored in the database. Databases are an important part of information systems because they serve as storage for data to be processed later [11]. Another advantage of this application is that it can be accessed from anywhere using a web browser [10].

Further investigation is carried out by observing the existing planner system. Four existing systems were selected in this research which are the Global Open Access Learning System (GOALS), Trello, Todoist, and myHomework Student Planner. GOALS is selected because it is the current system used by Universiti Sains Islam Malaysia (USIM) students and lecturers as an education platform, whereas Trello, Todoist, and myHomework Student Planner are chosen based on the ranking place second, third and fourth respectively of the best planner and reminder apps for students according to [12]. The existing system is chosen based on these four criteria which are projects which allow the system to sort the information by any necessary criteria, tags that allow users to systematize all current and strategic tasks effectively by tagging them with appropriate tags, and colors that visually highlight tasks of a certain degree of urgency and importance and filters which allows user to quickly select the necessary tasks using the filtering function built in the system.

GOALS (https://goals.usim.edu.my) is an abbreviation for Global Open Access Learning System which was established by Universiti Sains Islam Malaysia (USIM) in line with the development of online education systems. Fig. 1 shows the homepage of GOALS. The system provides users with a single dashboard that integrates information, management, and education while providing all USIM academic staff with reference and learning materials for educational programs such as quizzes, discussions, and teleconference systems. The system aims to coordinate e-learning programs such as Open Distance Learning (ODL), Lifelong Learning, and Open Educational Resources (OER) programs.

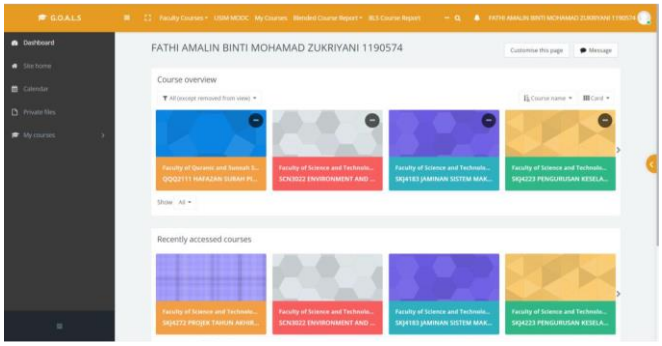

Fig 1: Global Open Access Learning System (GOALS)

GOALS is a web-based platform that can be used by both USIM students and lecturers and act as a learning medium between them. Modules that have been introduced to the users for this system are (i) news forum (online announcement), (ii) course outline, (iii) forum, (iv) upload file and website links, (v) online quiz, (vi) Web 2.0 tools (Prezi) and (vii) assignment. Those modules could be accessed through the e-learning tools used by both lecturers and students using GOALS specifically in USIM. To use the application, the user is required to log in by using the staff id or matric number. GOALS offered features Dashboard, Site Home, Calendar, My Courses, and others.

The dashboard contains a course overview that displays all courses that students enrolled in and recently accessed courses. Site home display GOALS website cover page. The calendar displays all assigned assignments and quizzes as shown in Fig. 2 in the monthly overview. In My Courses page, it displays all

courses that students enrolled in other forms. It also displays all courses that are available in USIM where users can sort in alphabetical order or the opposite alphabetical order and search for the course using the course code or course name. The system also serves as a place for students to submit their assignments. The assignment module allows teachers to collect and review student assignments and provide feedback such as grades. Students can submit any digital content (files), including word-processing documents, spreadsheets, images, audio, and video clips.

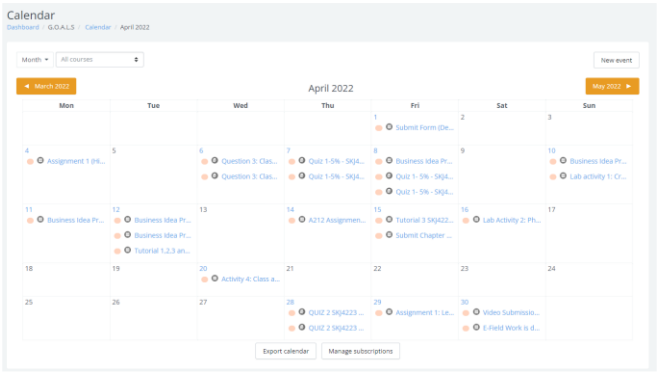

Fig. 2: GOALS – Calendar

One of the advantages of this system is that GOALS is a student-lecturer platform that is helpful and easy to use because the user can refer to all notes and learning materials on GOALS. GOALS also acts as an assignment submission place and quizzes can be done by using GOALS. It will be a burden for lecturers if there is no student-lecturer platform exist where they need to share learning materials daily or even hourly on communication platforms such as WhatsApp, Telegram, or other platforms. However, GOALS also have disadvantages. The disadvantage of GOALS is that GOALS is unable to offer the user reminder and notification features where it can alert the user. The existing reminder and notifications feature available on GOALS are notifications sent through email that has been registered in the USIM database. For the student who keeps on receiving lots of emails, the reminder emails sent by the GOAL system can be pushed down by other emails and cause the student to miss the notifications. Fig. 3 displays how the notification is sent through email.

GOALS are encouraged to implement a planner function with a feature where users can add plans and update the plan's progress. It is also recommended that these features implement with a scheduling algorithm where it can help user arrange their plan or task in priority order. The reminder and notification features that existed in GOALS are also recommended to undergo changes and upgrades from using email notification features to alarm notification features. For example, the alarm notification feature that is available on a smartphone is the notification displayed on the screen of the phone which is included with the countdown of the day and time from the marked dates.

Trello (https://trello.com) is a popular, simple, and easy-to-use collaboration tool that allows users to organize their projects and everything related to them on a board. Trello's workspace allows users to invite other members to join or edit the scheduler. Many advantages are of working together. Teams can complete tasks faster and more efficiently. Trello is ready to use right after the user signs up. It provides a free registration that gives users access to almost all features. Trello follows the Kanban system, which is a common method used to achieve lean management.

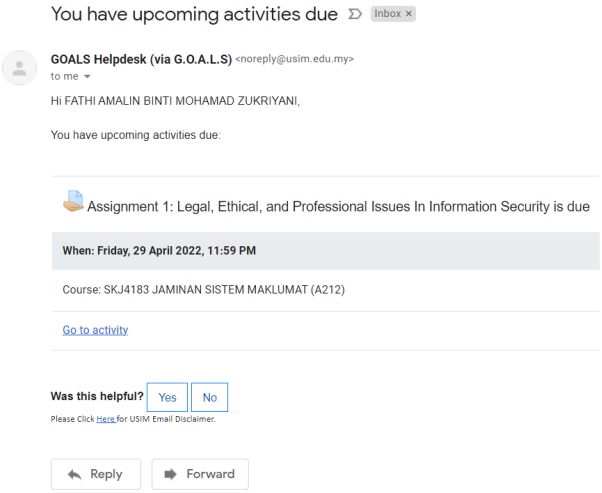

Fig. 3: Reminder and Notification sent through email.

Even though Trello is more focused on collaboration, it also can be used for personal purposes. Features that are available in Trello are board as shown in Fig. 4, lists, and cards that enable the users to organize and prioritize their personal and work life in a flexible and rewarding way. Lists and cards are the building blocks for organizing work on the Trello board. Trello card is a portal to more organized work, where users can manage, track, and share individual tasks with teammates. Each card on the board has an ecosystem of checklists, due dates, card labels, attachments, conversations, and more. Card labels are used to differentiate the type of task where users can edit the label's name and color. A to-do list is also one of many features that Trello offers.

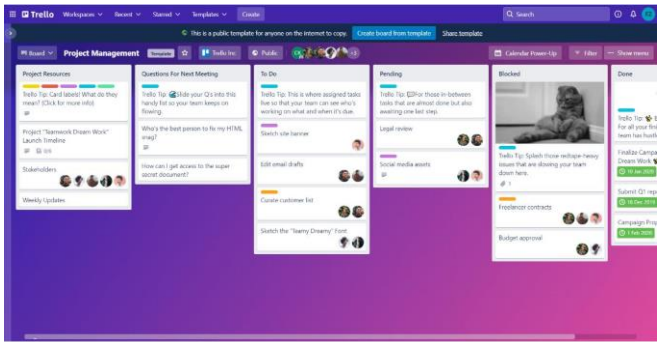

Fig. 4: Trello – Board

The advantage of Trello is this easy-to-use and most user-friendly way to organize workflow with a unique board and card system for a comprehensive progress view. With a dedicated board for each project and a card for each task, all tasks are ordered and tracked in a specific outcome list, minimizing the risk of confusion. The downside is that Trello has limited storage space. Trello allows attachments, but users of the free version only allow up to 10MB per upload. However, users can upgrade to 250MB for each upload and users need to pay monthly to upgrade their plans. Other than

that, for every complete checklist, the user needs to manually click the button for the cards to move from the To-Do list to the Done list, instead of automatically moving if all the checklists are done.

Todoist (https://todoist.com) is a project management software designed to help users effectively manage their day-to-day tasks. Todoist is focused on improving user workflows. Todoist provides multiple features such as subtasks, subprojects, recurring tasks, and notifications as shown in Fig. 5. In addition, there are labels, filters, and task priority levels for easy task classification and customization. Users can create new tasks, view the status of tasks in progress, and view all tasks completed with their Todoist account.

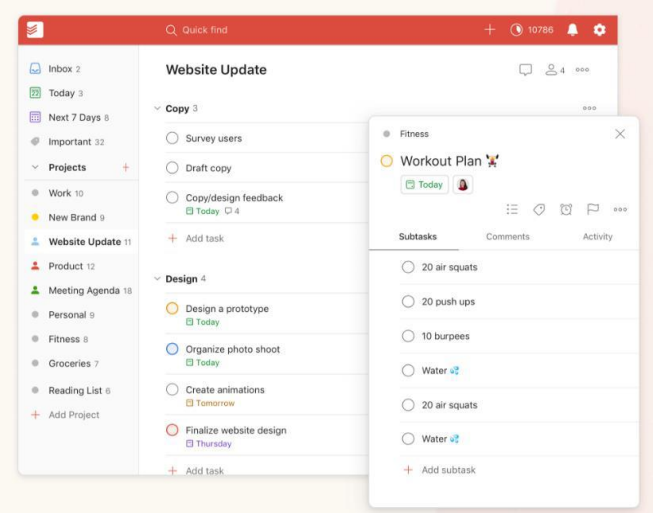

Fig. 5: Todoist

Todoist uses a unique scoring system called Todoist Karma to help users get going. Todoist Karma provides points to complete tasks by using advanced features and reach weekly and monthly productivity goals. Users can see specific progress using visual charts that are color-coded by project. Other features of the platform include task commenting, tracking expired tasks, creating recurring tasks, setting daily goals, creating customizable workflows, and personalized productivity trends.

The benefit of Todoist for task and project planning is it easy to use. This helps to divide a large project into smaller, more manageable parts with subprojects and subtasks. Projects, labels, filters, and priorities allow users to customize Todoist for their workflow. The drawback of this application is that Todoist has a built-in Today and Next 7 days view, which needs some fiddling with Todoist's filters if the users want to view the next week's dues. Users also need to upgrade their plan to be able to use other limited features.

myHomework Student Planner (https://myhomeworkapp.com) is a digital planning app that allows users to organize their schoolwork, upcoming tasks, and daily schedules. Fig. 6 shows this planner is designed to keep users organized, and on track, and significantly reduce stress. myHomework Planner is a clear, easy-to-use, and highly effective app. This is ideal for college students who have multiple classes that include assignments, tests, and homework that need to be tracked. myHomework is available on several platforms. This application allows users to use it anonymously or login with their Facebook, Google, or email accounts to store data in the cloud. myHomework is also integrated with Teachers.io, a free website where teachers can share class schedules, links, and announcements.

This planner is equipped with homework, classes, calendars, teachers, and announcements. The homework feature allows users to add assignments, quizzes, and project-related tasks. If the user wants to attach a file, it includes an in-app purchase. In the class feature, the user creates a course to attend, and the calendar provides the user with a monthly overview. The calendar allows users to add other tasks such as Event, No School Day, Late Start, and Early Release. Late start and early release refer to a class that starts later or is released earlier. Each added task is categorized based on the course created and the user can also set a reminder time.

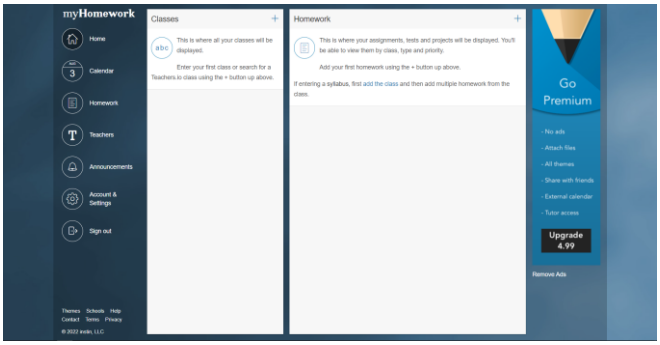

Fig. 6: myHomework Student Planner

The advantage of myHomework Student Planner is the collaboration platform between teachers and students implemented in this application. All tasks are categorized by the course taken. Users can set reminders for due dates and other purposes. Users can also add details for each task and update their progress in the form of checkboxes. The weakness of this planner is that it does not help students prioritize assignments. This is only one-way communication, as teachers can upload class information, but students can only view it. It is recommended that this application implement features with scheduling algorithms that help users prioritize tasks.

Each system has different advantages and limitations. However, the purpose of each system is to help organize users' tasks and workflow efficiency. Table 1 shows the comparison between Global Open Access System (GOALS), Trello, Todoist, and myHomework Student Planner.

II. METHODOLOGY

A methodology is a structured process when working on a project. The purpose is to provide a systematic approach to software development [13]. All methods have different strengths and weaknesses and exist for different reasons [14]. To manage projects efficiently, developers need to choose the best method for a particular project. Developers are spoilt with choices from the various software development methodologies that are available. Overall, this section presents the methodology approach by the researcher in developing a proposed system and the rationale for choosing it. The method chosen includes several phases that must follow, and this section describes each phase.

TABLE 1. COMPARISON OF EXISTING SYSTEM ON SYSTEM PLANNER

Existing System	Advantages	Limitations	Proposed Solution
Global Open Access Learning System (GOALS)	- A student-lecturer platform that is helpful and easy to use because the user can refer to all notes and learning materials - Act as assignment submission place and quizzes	The existing reminder and notifications feature available on GOALS are notifications sent through email.	Upgrades from using email notification features to alarm notification features.
Trello	- Easy to use, the most user-friendly way to organize workflow, and come across with a users' board and card system for a comprehensive progress view. - All assignments are ordered and tracked in a specific service list to minimize the risk of confusion.	For every complete checklist, the user needs to manually click the button for the cards to move from the To-Do list to the Done list, instead of automatically moving if all the checklists are done.	Automatically moved if all the checklists are done.
Todoist	Use subprojects and subtasks to help divide large projects into smaller, more manageable parts.	Todoist has a built-in Today and Next 7 days view, which needs some fiddling with Todoist's filters if the users want to view the next week's dues.	Add a function where the list can be viewed in the monthly overview.
myHomework Student Planner	- All tasks are categorized by the course taken. - Add details for each task and update the progress in the form of checkboxes.	- Doesn't help students prioritize tasks. - Teachers can upload class information and students can only view it, so only one-way communication.	Implement a function using a scheduling algorithm to allow users to prioritize tasks.

The waterfall method is a linear model consisting of a series of phases which are requirements, design, implementation, verification, and maintenance with a focus on specific goals, as shown in Fig. 7. Developer must complete each step of the workflow before proceeding to the next step. Waterfalls are suitable for projects with clear goals from the start of development. Hence, the chosen Software Development Life Cycle (SDLC) for developing the proposed UniPlanner: Student Academic Planner system is a waterfall methodology.

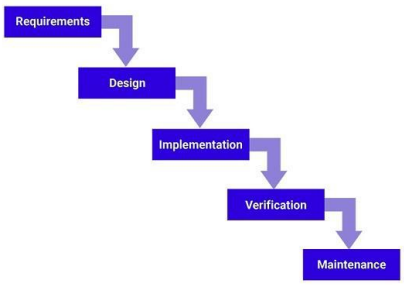

Fig. 7: Phases in Waterfall Methodology

The waterfall model is an SDLC model first defined by Royce in the 1970s [15]. The waterfall model is suitable when the final product has a clear picture and well-defined requirements. This process includes a set of steps that help developers find an error in one phase so that developers can identify and fix the error before proceeding to another phase. The waterfall model is chosen for the proposed system because according to [15], the waterfall model provides the structure for organizing and controlling software development projects. Design details and flaws are captured by methods before the software is created, saving developers time in the development process.

The requirement analysis phase is also known as Software Requirement Specification (SRS). This is a complete description of the behavior of the software being developed [15]. Both functional and non-functional requirements are defined in this phase [15]. Functional requirements can be defined as requirements specifically requested by the end user as basic functionality that the system must provide, such as purpose, scope, perspective, functionality, software attributes, user characteristics, and database requirements [15]. Non-functional requirements, on the other hand, are quality constraints that the system must meet by the following project contracts such as constraints, limitations, and requirements on the design and operation of the software [15]. All requirements for the product designed and developed are collected and documented in SRS documentation. The requirement analysis of this project is based on the studies of the existing student academic planner and the current situation faced by the student during the pandemic Covid-19.

The next phase of the SDLC is the design phase. In this part, the project requirements are transformed into a detailed design. According to [16], at the design stage, developers and technical architects begin with a high level of software and

system design to meet each requirement. This phase includes the software solution planning and problem-solving process, including algorithm design, software architecture design, logical diagram schema, and data structure definition [15]. The outcome of this phase is a description of how the system should be designed and implement [17]. In the design phase, all aspects of designing the system are considered on how the system will be displayed. According to [18], one of the key steps in building a design system is by creating a visual design language. The visual design language is made up of four main categories which are colour, typography, sizing and spacing, and imagery. The role of each of these design elements should be considered in every component on the screen. A good system design defines the elements, interconnection, and purpose of the system.

The implementation phase refers to understanding business requirements and designing them into reliable executable programs, databases, and websites through programming and deployment [15]. This is where the actual code is written, and the database and text files are created and compiled into a ready-to-run application [15]. This system is developed in a small program called a unit [19]. The programming language used depends on the type of software developed. HTML, CSS, PHP, and JavaScript are the programming language used during this phase. Table 2 will explain more about these languages. Developers also perform basic unit tests before moving their code into the testing phase.

TABLE 2. LANGUAGE AND TOOLS USED IN SYSTEM IMPLEMENTATION

Language/Tool	Description
HTML	Used to organize the content and layout of a web page.
CSS	For styling the web content.
JavaScript	Adding browser-specific HTML content or CSS style to improve the appearance of web pages and user interfaces.
PHP	The PHP code will be translated by the web server, which will produce HTML or other visible output.
phpMyAdmin	The database of the system.
IntelliJ IDEA	A tool used to implement the coding.

System verification, also known as system testing, involves the process of verifying that software expectations meet their original performance and specifications and meet their intended purpose [15]. Each component of the software is individually tested to ensure error-free software and component integration. Detected and system errors are fixed and redefined accordingly [20]. This phase also includes a validation process in which the software is evaluated during and at the end of the development process to ensure that it meets the specified requirements [15]. The tests are based on real-world data, determine the performance of the system in a real-world work environment, and document test reports. The functional tests performed on this system are user acceptance tests. Testing is important to provide high-quality products before deploying the system to users.

The maintenance phase involves the process of modifying software solutions after delivery and deployment to improve output and improve performance and quality [15]. Maintenance allows developers to fix bugs that were not detected in the previous phase. Activities in this phase include collecting maintenance requests from end users, translating those requests into changes, designing changes, and implementing changes.

III. PROPOSED SYSTEM

A. Gaps founds in the existing student academic planner

The gap found in the existing student academic planner is that GOALS is unable to offer to the user the reminder and notification features were it able to help alert the user. The existing reminder and notifications feature available on GOALS are notifications sent through email that has been registered in the USIM database. For students who keep on receiving lots of emails, the reminder emails sent by the GOAL system can be pushed down by other emails and cause students to miss the notifications. Fig. 8 displays how the notification is sent through email.

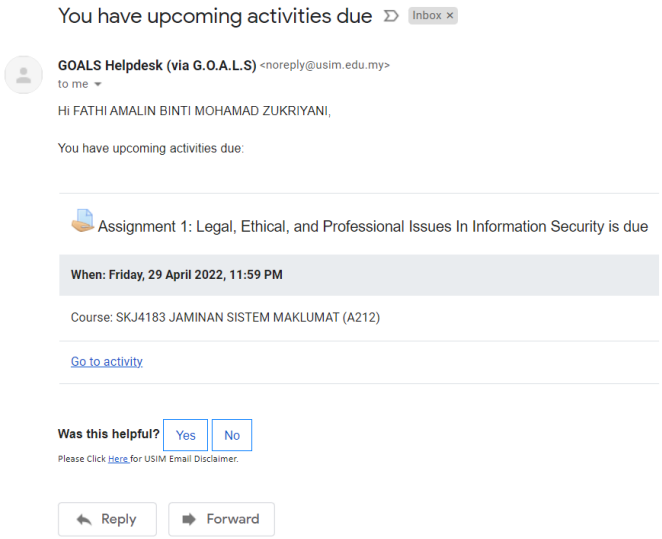

Fig. 8: Reminder and Notification sent through email.

On the other hand, in myHomework Student Planner, the gap is that the planner has minimal options for reminder features in the due time section. In this section, users need to type the time they desired instead of clicking to choose the time and the due time cannot be filled with the time range. For example, from 2:00 PM to 5:00 PM as shown in Fig. 9.

The next gap is in Trello. For every complete checklist, the user needs to manually click the button for the cards to move from one list to the completed list, instead of automatically moved if all the checklists are done. Fig. 10,11, and 12 show the process of how the cards manually move from To Do list to the Done list after the checklist is completed.

Fig. 10 shows that the user needs to click on the Done button in the automation section for the cards to move to the Done list. Users also can click on the move button on the action sections to move the cards to other than the Done list. If users forget to click on the done button or move button, the cards on the list will be too crowded with pending tasks and completed tasks.

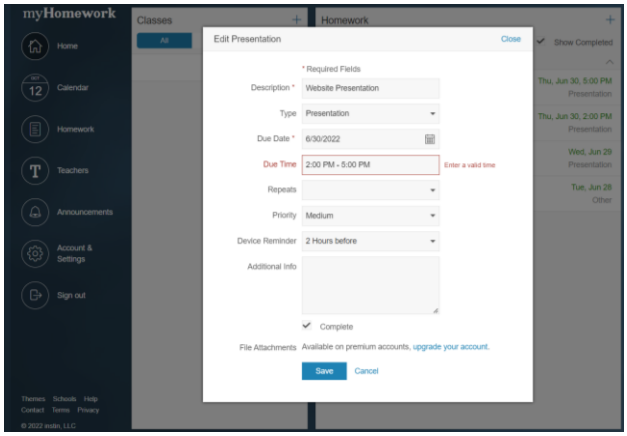

Fig. 9: Due time section

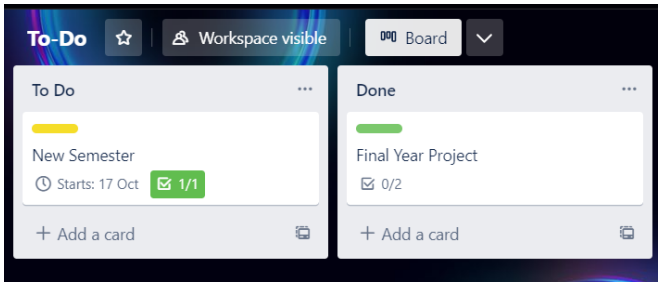

Fig. 10: Trello - Cards

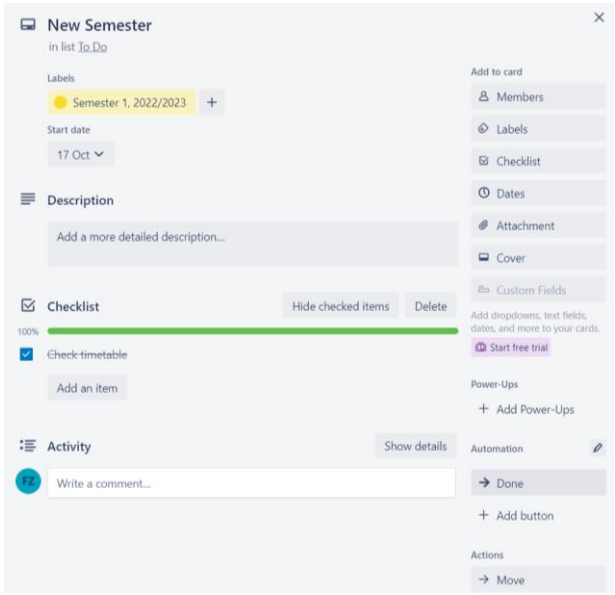

Fig. 11: Trello – Card Descriptions

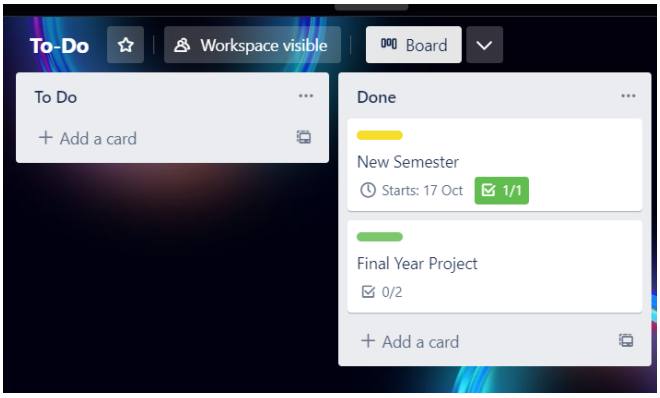

Fig. 12: Trello – Completed Card

Lastly, in Todoist, the gap found in Fig. 13 is that the calendar feature is shown in the list view. The task and other information are indistinguishable which can make users overlook the task. Other than that, this planner also doesn't offer a function where the user can update or review the task from the previous day. The availability of this function is important to ensure the task or event are kept up to date so that user can refer to and review it in the future. Fig. 14 display the calendar where the user cannot click on the previous date.

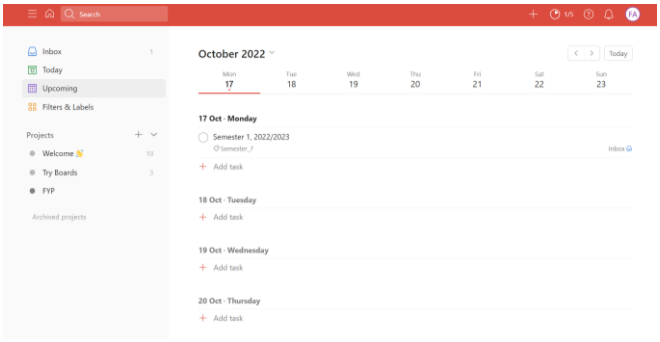

Fig. 13: Calendar showed in list view

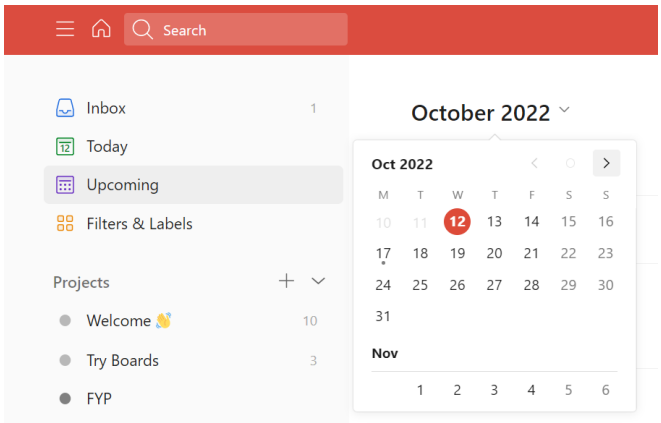

Fig. 14: Cannot update and review task from the previous day

Based on the gaps found in the existing student academic planner, suitable solutions are proposed and listed in Table 3 including the gaps found.

TABLE 3. GAPS FOUND IN THE EXISTING PLANNER AND PROPOSED SOLUTION FOR UNIPLANNER

Existing Student Academic Planner	Gaps Found	Proposed Solution for UniPlanner
Global Open Access Learning System (GOALS)	- Users are unable to plan or update the plan's progress. - Notifications are sent through email with no reminder features.	- Reminder feature will be using alarm notification features on the user's phone. - Alarm able to alert the user on the date and time of the event or task. - For example, the alarm that is displayed on the screen of the phone includes a countdown from the day and time from the marked date.
Trello	For every complete checklist, the user needs to manually click the button for the cards to move from the To-Do list to the Done list, instead of automatically moved if all the checklists are done.	Automatically moved cards if all the checklists were done.
Todoist	- Calendar is shown in list view. - Cannot update and review tasks from the previous date.	Add a function where the list can be viewed in the monthly overview.
myHomework Student Planner	Minimal choices in the due time section.	Add more choices in the due time section.

B. Possible threats and ways to mitigate

As web application technology evolves, more secure security measures must be implemented. Web application security is important in building websites that are secure and can detect and prevent cyber-attacks [21]. This includes a set of security features built into web applications to protect them from a growing variety of threats [21]. Possible threats to the website need to be identified first for proper actions to be taken. This paper will discuss a few possible threats to the website and ways to mitigate the threats in Table 4.

C. Functions and features of UniPlanner

This section dedicates to showing the proposed user interface (UI) design of UniPlanner: Student Academic Planner. This section will highlight five user interfaces chosen by the researcher, which are Log in the interface, Homepage interface, New Task interface, Board interface, and Calendar interface.

In this interface, as shown in Fig. 15, users need to log in to their account as registered by inserting their username and password to be able to use the planner. If a user forgets their password, they can click on forget password button, where a link will be sent to their email to update their new password. First-time users, need to register first by clicking on the register button. Once a user successfully logs in, the user will be directed to the homepage.

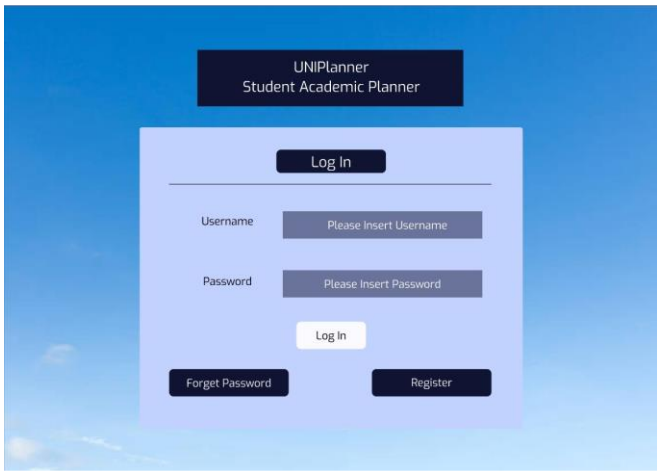

Fig. 15: Log-in Interface

After the user successfully logs in, the homepage interface will be displayed. In the homepage interface, a navigation menu is displayed on the left part of the screen. The menu consists of six buttons which are new task, homepage, board, to-do list, calendar, and timetable. The main part of the screen is displayed with the plan of the day, where the user can see their plan from the next day, the previous day, and for the past month or next month.

TABLE 4. POSSIBLE THREATS AND WAYS TO MITIGATE

Possible Threats	Mitigation
Broken Authentication - A broken authentication vulnerability allows a bad actor to gain control over an account within a system or the entire system [22]. This is possible if the adversary carries out a brute force attack to disguise itself as a user, permitting the users to use weak passwords that are either dictionary words or common passwords [23].	Password Complexity - The requirements for password selection are designed to increase password complexity in the interest of better security [24]. - The inclusion of a minimum number of lowercase and capital letters, numbers, and special characters are guidelines that are required to create passwords [24].
Brute Force Attacks - A hacking method that uses trial and error to crack passwords, login credentials, and encryption keys for gaining unauthorized access [25].	Password Encryption using Bcrypt Hashing Algorithm - Bcrypt can mitigate brute force attacks by combining the expensive key setup phase of Blowfish with a variable number of iterations to increase the workload and duration of hash calculation [26]. - Bcrypt is a slow hash compared to SHA-256, making it ideal for passwords. The slower bcrypt is the better for passwords because it's more resistant to brute force attacks for the short amount of data [27].
	Two Factor Authentication - Two factors authentication is essential because it neutralizes the risk associated with passwords. If a password is hacked, a password alone is useless without approval at the second factor [28]. - One Time Password (OTP) is one of the popular forms of two-factor authentication that can secure users' accounts. - Time-based one-time passwords (TOTP) are codes that are generated using the secret key and the current time that is changed frequently which makes TOTP more secure compared to HMAC-based one-time passwords (HOTP) [28].
Injection - Injection or SQL injection is a type of security attack in which the attacker inserts or injects a query via input data from the client side to the server. If it is successful, the attacker can read, add new, update, delete some data from the database, issue administrator commands to carry out privileged database tasks, or even issue commands to the operating system [23].	Upload File Restriction - The file types allowed to be uploaded should be restricted to only those that are necessary [29]. - Perform filtering and content checking on any files which are uploaded to the server according to the list of permitted extensions on the web applications [29].

The plan of the day is presented task per task. If the user has many tasks on one day, the user can click on the next button to view the task as shown in Fig. 16. Title, labels, descriptions, checklists, and time of the task are included in each task. The user is also allowed to edit the task.

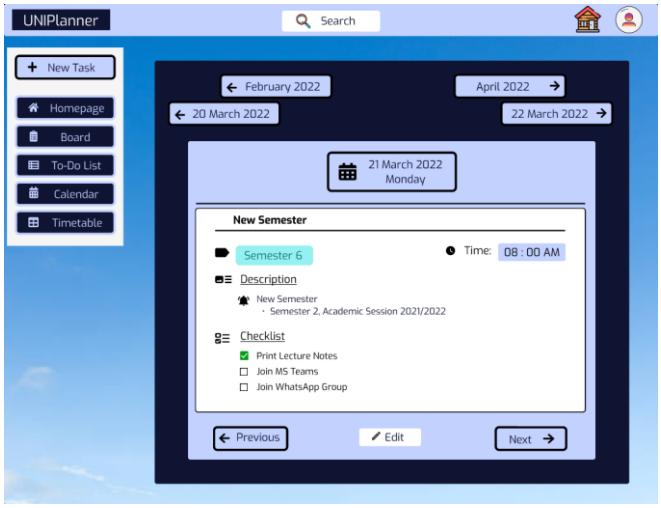

Fig. 16: Homepage Interface

Fig. 17 shows the new task interface where the user can add a new task. In the new task, the user can include the title, label, descriptions, checklist, time, and date of the task. The user also needs to choose which file will the new task be saved. For the label, users can choose any label they want, or user can create a new label. The labels are used to distinguish between the tasks. After the new task is saved, the task will be moved to the board interface and into the file chosen.

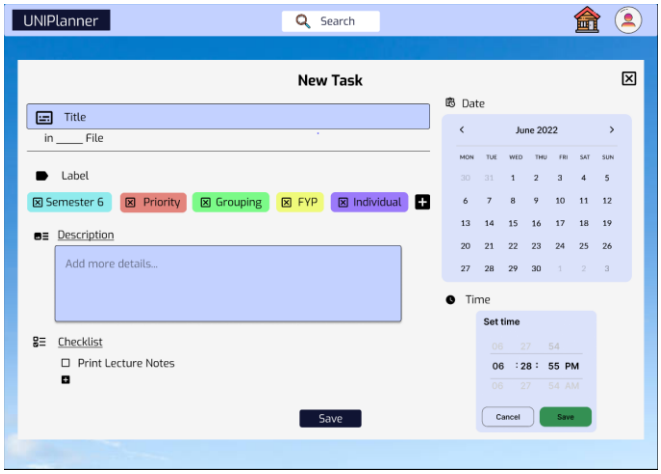

Fig. 17: New Task Interface

On the board interface, the task is displayed based on the file. Users can create a new file and add new tasks to the chosen file. If the user wants to edit the task, the user needs to click on the task and edit it. All new tasks will be automatically added to the To-do file and the chosen file. Once the task is completed, the task will be moved to the completed file. If the task is overdue, the task will be moved to a delayed file and the time and date will turn red as shown in Fig. 18. The colour of the file can be set as user preference.

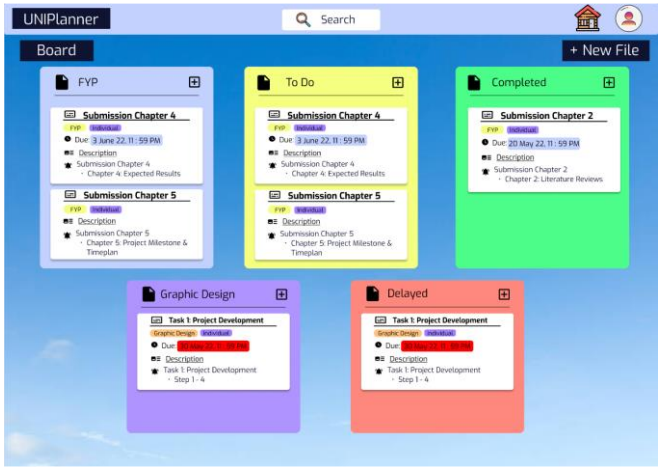

Fig. 18: Board Interface

The calendar is used to display the overall task in a month as shown in Fig. 19. The task is coloured based on preferences and the details of each colour are included. To view the full task, the user needs to click the list on the calendar.

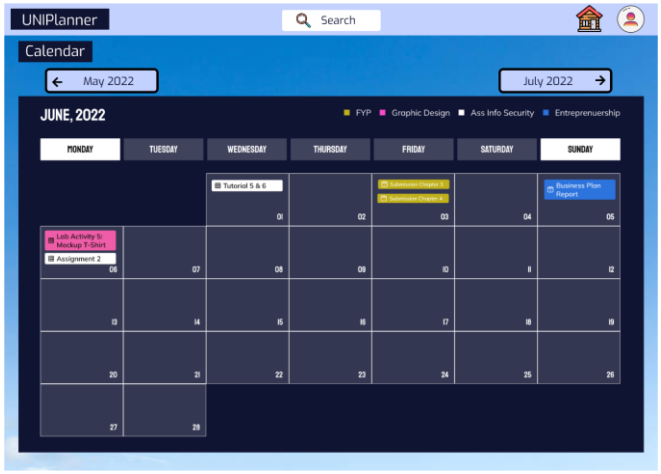

Fig. 19: Calendar Interface

IV. CONCLUSIONS

This research aims to develop a web-based system UniPlanner that aims to help students to solve their time management problems while increasing the effectiveness of their studies. The security features implemented in this system are password encryption by using the Bcrypt hashing algorithm, password complexity, uploaded file restriction, and two-factor authentication. This system is expected to allow users to record their daily routines and calculate CGPA scores. It also allows users to set a reminder and display the important task that must be done. Users also can update the information that has been entered.

To develop the UniPlanner system, it is not easy to produce the perfect system without a single limitation. The first limitation during this research process is there is limited research paper related to this topic and most research papers are outdated. Other than that, to access this system, users must have an Internet connection. If the user has a poor Internet connection, they may encounter some obstacles while using the system. UniPlanner also can be further developed to improve better to increase usability and functionality of the system. This system can be developed as a mobile application because this platform is more convenient compared to a web-based system.

In a nutshell, by developing a web-based system with the implementation of security measures, the system is expected to be able to answer the main purpose of this research which is to help students to solve their time management problems while increasing the effectiveness of their studies.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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