Calendar.io: Smart and Automatic Scheduling for Atenean Students

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Project Details

Problem

Students under the self-paced online setting in ADMU are finding difficulty in managing their school requirements and creating a schedule that works best for them. Students can sometimes spend too much time on one requirement, forget an incoming deadline, and have problems with pacing themselves considering ADMU's self-paced learning implementation for online learning.

Target Users

Our target users are college students from ADMU that are taking online classes. ADMU's current online setup is self-paced and is heavily reliant on the students' own time management skills unlike other universities whose class pacing and class schedules are already built for them.

Potential Solution

Application that creates a personalized schedule for its users - This app will take data from the users and run an algorithm that creates a personalized schedule for them to work on their requirements and other responsibilities in class. This created schedule will consider a variety of factors such as time needed for a requirement to be accomplished (which can be personalized to suit the pace of the user), the deadline of the requirements, and the availability of the user to work on said requirements. This is to improve their time management/efficiency with handling school requirements in the online setting while still considering their preferences.

User Research Methodology

Research Goal

We wanted to better understand ADMU students' current scheduling systems in terms of their efficiency. Also, to identify minor flaws in their systems or considerable lapses in their creation. We want to know how we can improve ADMU college students' scheduling systems to provide them with solutions in managing their time more efficiently with regards to finishing their school requirements in the self-paced online learning paradigm.

What do we want to find out?

- Their current scheduling strategies
- Their current scheduling strategies' rate of efficiency
- Lapses/gaps in their current scheduling systems

- If they think that creating a personalized schedule would be beneficial to them regarding their school requirements and would give a better learning experience

Target Participants

- College students from ADMU
- Should have taken at least one fully online semester

Research Plan

We plan to conduct one-on-one interviews with three participants using Google Meet after sending out the demographics questionnaire. These interviews are to be scheduled ahead of time and will be structured to learn as much as possible about the participants and how they handle their schedules and manage their time regarding their school requirements.

User Research Instruments

Demographics Questionnaire:
https://forms.gle/ujiT3BJ78JD4NRkH7

Script

Good Morning/Afternoon/Evening. My name is Jimson. Thank you for agreeing to participate in our research and lending a bit of your time with us. First of all, we are conducting this user research in the hopes of improving the scheduling systems of our target users. This is done in fulfillment of our requirements in our Human-Computer Interaction class under the guidance of Mrs. Jenilyn A. Casano. Your answers will help us further refine our problem and guide us to providing a good solution to this problem.

We would also like to ask for your consent to record this interview so we can review your answers better. Rest assured that the information you will provide will be confidential and we will only use this recording for the sole purpose of the aforementioned research. Are you comfortable with that? [YES/NO]

This interview is now being recorded and we can already begin if you are ready. Just let me know. [READY/NOT READY]

Interview Questions:

- How do you usually go about a normal school day in the current online setting? (Introductory Question)
    - What are your usual study habits?
    - What time do you prefer to study?
    - With finishing requirements, do you prefer doing things bit-by-bit or all in one go or both depending on the requirement?
- Do you have scheduling or time management strategies currently in place to help you through online classes? If yes, what are these strategies?
    - What are the tools or apps that you use to implement these strategies?
    - How much time do you usually spend implementing them?
    - Do you follow your schedule consistently?
    - Do you usually submit your school requirements on time?
    - Have you had any instances in the past online semesters where you find it quite difficult to follow your schedule?

    - In your opinion, how efficient is this scheduling system for your needs?
- For you, what makes a schedule good?

- What are the difficulties you've encountered in managing or maintaining your school schedule?
- What do you think are the lapses/gaps that your current scheduling system has in the context of finishing school requirements on time?
- In your opinion, how do you think your current scheduling system can be improved to suit your needs?
- If there were a more efficient way that you could manage your time working on school requirements, would you be willing to try it out?
    - If yes, do you think that creating a personalized schedule would be beneficial for you regarding your school requirements?

User Persona

KAT DOMINGUEZ

I'M A PROCRASTINATOR AT HEART. MOVING THROUGH LIFE AT MY OWN PACE.

ABOUT

Age
20 years old

Year
3rd Year College

Course
BFA Creative Writing

CONTEXT IN RELATION TO POTENTIAL APP

Kat usually takes 15 mins/day setting up a schedule for herself. She often uses her laptop for this but occasionally makes use of her phone to set reminders. She likes to stay connected to the internet while doing all this to make sure that she doesn't miss a requirement. With the previous scheduling apps she tried, she preferred to use mobile and desktop apps.

CASUAL QUOTE

"I like to keep a flexible schedule that best fits me and my study habits, and allows me to use my time wisely."

RELEVANT SKILLS/EXPERIENCES

Kat has taken 2 fully online semesters in ADMU. She has tried scheduling/calendar apps but likes to rely on sticky notes instead. For the more important school-related matters, she puts them in a notes app on her phone and laptop and sets reminders for those. She also keeps a whiteboard as a checklist of pending requirements. The Canvas Dashboard is her best friend, for it contains the necessary information she needs to go about her day. She prepares a schedule only when she feels like she can no longer procrastinate. She also prefers to work on her requirements bit-by-bit, with long breaks in between. Most of the time, she keeps a flexible schedule and works exclusively on weekday afternoons. Still, she submits most of her requirements on time and rarely passes late. She is always willing to try a scheduling app that would personalize a schedule for her work ethic without being to tedious to set-up.

GOALS, ATTITUDES, AND CONCERNS

Goals

A schedule that is flexible and open to changes. She wants one that is personalized to her needs and keeps her motivated. From her experiences with other scheduling/calendar apps, she sets ease of use and useful features (like an integrated Canvas dashboard) as her priorities.

Attitudes

She would like to find better ways to make use of her time more efficiently. Scheduling is one thing, but making sure that she is comfortable with her schedule is also a point of focus.

Concerns

She tends to procrastinate a lot. She constantly looks for motivation to finish her work.

MIGO VILLAREAL

I HAVE A LOT OF TASKS AND I KEEP THEM IN STACKS. IT IS A FACT THAT I LOVE TO RELAX 'CUS I AM CAREFREE AND LAX.

ABOUT

Age
19 years old

Year
2nd Year College

Course
BS Management

CONTEXT IN RELATION TO POTENTIAL APP

Most of the time, Migo manages his tasks in his head but whenever he feels like making one, he spends at minimum, an hour of his day to create his schedule. Instead of using wifi-reliant scheduling apps, he makes his own in Microsoft's Word application where he lists all of his tasks for the day and allots a specified number of hours to be spent on for each one. His reason for doing this is so that when the wifi goes down, he'd still be able to access his schedule.

CASUAL QUOTE

“““An app that comes with a personalized schedule and is also customizable that could fit my needs would be nice”

RELEVANT SKILLS/EXPERIENCES

Migo has taken two (2) fully online semesters in ADMU. He does not follow a strict plan or schedule. He doesn’t use scheduling systems and manages his tasks in his head, though sometimes he puts all his tasks in a single document to serve as his reminder. He often prefers to do his requirements when “he has the time,” nevertheless he is able to submit all of them a few minutes before the prescribed deadline. Since he is a very lax person, he finishes his requirements one at a time. Depending on the type of requirement, he may accomplish all of them in one go. He has displayed willingness to try scheduling apps that accommodates to his needs so that he could get his acad-life back on track, but never really commits to them because they lack the necessary features that he deems will solve his problems.

GOALS, ATTITUDES, AND CONCERNS

Goals

Migo would love to have an app that reminds him to finish a requirement days ahead before the prescribed deadline, one that is highly customizable to fit his needs, and whose algorithm takes into account his available hours.

Attitudes

He finally wants to set his priorities straight and to get back on track.

Concerns

He often gets lazy and always delays the submission of his requirements.

ABOUT

Age
21 years old

Year
4th Year College

Course
BS Economics

CONTEXT IN RELATION TO POTENTIAL APP

Bianca spends an estimate of 30 minutes per day implementing her current scheduling solution. She does this every night and usually on her phone. She primarily uses her phone and laptop for her schoolwork but in tracking and managing her schedule as well using the app and a desktop app/website.

CASUAL QUOTE

> Right now, my current scheduling system is a bit too flexible, so if there's [an app] that would recommend tasks that I can do in a specific timeframe, it would make my day more productive and efficient.

BIANCA REYES

I PREFER TO BE ORGANIZED WITH ALL MY STUFF BUT IT IS STILL GOOD TO HAVE A BIT OF FLEXIBILITY.

RELEVANT SKILLS/EXPERIENCE

Bianca has taken 2 fully online semesters in ADMU. She currently uses a few tools and apps to help her manage her schedule for accomplishing her school requirements. She lists down her tasks for the following day every night on her dedicated notes app. It helps her to have a sense of direction for the next day. She doesn't follow a strict schedule to allow her to have a little bit more flexibility when working on other things such as extracurriculars and house chores. She also prefers working on her requirements in one sitting rather than dividing it into multiple parts as it helps her to focus more on the task at hand. She would also be willing to try an app that would make her setting up and scheduling system faster and more efficiently.

GOALS, ATTITUDES, AND CONCERNS

Goal

Bianca wants her day to be as productive as she can make it but also allows her to have a good amount of rest and a number of breaks in between her tasks.

Concerns

She would like the app to be able to categorize certain events and requirements as urgent and that would make the app remind her about those things.

Attitudes

Bianca would love to use an app that would automatically create a schedule for her. She sees this as an opportunity to save time and effort from creating it herself. Though, she would still prefer to have a sense of control on her schedule by allowing her to customize certain aspects of it.

Pain Point

A common issue that our research participants found is the lack of flexibility of the other scheduling software they have tried. Take Google Calendar, for example, an app that most of the users that we interviewed use. The existing scheduling system would require the users to manually adjust their schedule if they are not able to follow their schedule due to unforeseen circumstances, such as when they have far more urgent matters to attend to or are at times disengaged from accomplishing their current tasks. One of our interviewees emphasized the latter reason. According to her, there were days when she suddenly felt detached and didn't feel like doing anything. This issue is not specific to her alone, and it could be a reason to ruin any person's schedule. Another interviewee pointed out that he used to create time blocks for his schedule using Microsoft Excel, but he eventually stopped because he realized a minor change in his plan would mean that he has to manually adjust all the events that would be affected, inadvertently creating a bad user experience. We found that this inflexibility that they experienced with the apps they have tried has steered them away from using these scheduling apps in the first place, which, according to them, could have contributed to difficulties with managing their time wisely in finishing their school requirements.

Design Prescription

The main design prescription that we have for this pain point is presented within a reminder that our app would show. Because the app seeks to create the schedule based on the user's needs (as per their input), they will be reminded every time a task is scheduled to be accomplished. This reminder, which will come in the form of a push notification, shall occur 10 minutes before the task's scheduled deadline. In this reminder, the user is granted the liberty to do what they would wish to do with the indicated task (that was chosen and scheduled by the app itself). They may choose to do the task right away or reschedule if they would want to forgo that task for the time being.These options would appear as "Do Now" and "Reschedule". This solves the issue of inflexible scheduling and puts the user at the center of the entire process. With changing minds and moods (as experienced by our research participants), this flexibility will ensure that their schedule fits their needs and considers their situations at any particular time.

Choosing to reschedule will provide users the option to either **reschedule themselves** or **let the app handle the rescheduling**. Various feedback will be provided throughout so that the user, at any particular moment, knows where they are in the process. If the user chooses to reschedule themselves, they are able to select a date (dates before the current day and dates after the deadline are prohibited) and time. To avoid errors while scheduling time, the user will be shown a "Day View" of that day containing all the events they have for that day, making sure that the user will only select an available time slot. Choosing to let the app reschedule for the user will show a dialog box indicating what day and time the task/event will be scheduled to, as well as a "Day View" of that day's events. Here, the user will be able to either agree with the app's chosen time slot or let the app choose another available time.

For some events, the option to reschedule may not be feasible. There will be situations wherein the task/event can no longer be pushed to another time slot for various reasons (due to the lack of available time slots and/or deadline restrictions). For these instances, a push notification will be displayed on the top of the user's screen, indicating that it is non-reschedulable, as well as the app's reasoning behind it.

Paper Prototype

https://drive.google.com/file/d/1AxtGqMdPmNr6vOBCGCpc3lMN6TBCdER_/view

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Goals, Questions, Tasks, Metrics, Target Respondents

Goals

- To determine how usable the app's UX is based on the paper prototype.
- To determine how useful the flexibility feature that our app implements in the paper prototype is.

Research questions

Usability

SUS:

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system were well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

Additional queries:

1. The prototype's design and processes are consistent across the prototype.
2. The prototype's design is recognizable and is consistent with other apps I have used before.
3. I did not run into any problems/errors while using the prototype.
4. The prototype is able to do what it is expected to do.
5. I'm satisfied with how long it took me to tell the prototype that I will do the designated task.
6. I'm satisfied with how long it took me to reschedule a task on my own.
7. I'm satisfied with how long it took me to reschedule a task using the prototype's suggestions.

Usefulness

1. It is useful for completing my academic requirements.
2. I think it will make me productive in completing my tasks
3. I think it will enable me to make efficient use of my time.
4. I think it will save me time in terms of task scheduling.
5. I think this will make accomplishing my tasks easier and more convenient.
6. I think it will give me more control over the activities in my life.
7. I think that the flexibility the prototype offers will fill a gap in my scheduling.

Open-ended questions regarding user satisfaction that will not appear in the questionnaire.

1. How would you describe your experience navigating through our prototype (were there too many buttons etc)?
2. What things did you like least with the paper prototype?
3. What did you like most with the paper prototype?
4. How satisfied are you with how this feature can help with your scheduling?
5. How do you think this can be improved?

Tasks

- Each screen will be presented to the users. They will determine what each element/region in the screen represents/does.
    - This is the first task that will be performed by the respondents. This is to make sure that they come into this task with no prior knowledge of what each screen does. The powerpoint file that contains our prototype would be given to the respondents beforehand. During the video call, the respondents would share their screen and go through each slide/screen and, with their cursor, they will try to describe what each element/region in the screen represents/does.
- Respondents will reschedule an event/task on their own
    - By taking advantage of the interactivity simulated by the powerpoint file, each respondent will be tasked to reschedule an event/task on their own. There is only one possible route that the prototype will let the respondents take.
- Respondents will let the app reschedule an event for them instead of doing it manually.
    - Another option for the user would be to allow the app to automatically reschedule the event that was prompted to the user, and on this part, they will be tasked to do so.
- Respondents will use the app and confirm that he will do the designated task.
    - By taking advantage of the interactivity simulated by the powerpoint file, each respondent will be tasked to confirm that they will do the designated task. There is only one possible route that the prototype will let the respondents take.

Target Respondents

- Since our target users are college students from ADMU, our target respondents will come from that specific population. Because our app's use case is mainly for the self-paced online learning setup that ADMU implemented, only Ateneans who have gone through at least two online semesters will be taken as respondents. To make

sure that the respondents see our prototype with a fresh set of eyes, we intend to not invite the same people we used for our previous interviews.

Metrics

- Task Success
    - During the testing proper, a set of tasks will be given for the users to do. They will access the prototype via a powerpoint file where they will perform the said tasks. This metric will measure the success rate of the participants in performing the tasks assigned to them. Their performance will be assessed depending on whether they were able to fully complete, partially complete, or not able to complete the task.
- Time a Task Requires
    - The paper prototype is presented interactively using powerpoint. A link is placed over each 'button' and links to other slides, simulating button functionality like on touchscreen devices.This metric will be based on the time the user spends accomplishing each of their tasks.
- Error Rate
    - The paper prototype is presented interactively using powerpoint. A link is placed over each 'button' and links to other slides, simulating button functionality like on touchscreen devices.This metric will be based on the number of times the users committed errors while using our prototype.
- User Satisfaction
    - This metric will be measured via some items in our questionnaire and open-ended questions that the test monitor will ask the respondent. These questions seek to make the respondents describe their overall satisfaction with the prototype considering the design of the prototype, the flexibility feature, and the processes involved. These questions will be asked right after finishing all the tasks.

Test Plan

Brief description of your app/system/website

Our paper prototype is a mobile app that seeks to make the scheduling experience in the self-paced online learning setup easier for Ateneans.

Research Objectives

The purpose of this investigation is to evaluate the usability of the application's UX based on the paper prototype and evaluate the usefulness of the flexibility feature that it implements.

Methodology

We are planning to conduct a remote synchronous study with college students from ADMU who have taken at least two semesters under the self-paced online learning setup. We will ask these participants to navigate through our application and perform the tasks we have prepared for them. Synchronous sessions will take place at each participant's desired time on

either Zoom or Google Meet, depending on each participant's preference. These sessions will be recorded. Since the target respondents come from the same group of people as the researchers, respondents will be invited by the researchers themselves. Those who will be recruited won't be the same people that participated in the researchers' previous interviews, to make sure that those who will participate will do so with a fresh perspective.

At the start of the session, the respondents will be given a brief description of the application, as well as the prototype's functionality. Each participant will then be sent a soft copy of the powerpoint file before the session. They will each share their screens and, accompanied by the test monitor, will describe what each element/region on each slide/screen represents or does. This is the first task that will be performed by the respondents.

After this each participant will be asked to use the prototype to reschedule an event/task on their own, just as they would if they were doing it to adjust their own schedules. Then, each participant will be asked to let the prototype reschedule an event for them instead of doing it manually. Here, each participant will be asked to select the first time slot suggestion of the prototype and confirm. Then, they will reset and select the second time slot suggestion of the prototype. For the last task, each participant will be asked to use the prototype to confirm that they will do the designated task. All of these tasks will be accomplished by each participant while sharing their screen. In all of these, one of the researchers will record data such as their level of completion (not completed, fully completed, partially completed), the time it took for them to complete each one, and the number of mistakes they made while navigating the prototype.

To determine overall user satisfaction regarding the design of the prototype, its processes, and the flexibility feature itself, the test monitor will ask a few open-ended questions (e.g. What did you like most with the paper prototype?; How satisfied are you with how this feature can help with your scheduling and why?) right after the tasks are completed.

After these questions, the participants will answer a questionnaire in Google Forms that will be provided by the test monitor. This questionnaire is split into two parts: items that will measure usability and items that will measure usefulness. The researchers made use of the System Usability Scale to measure usability (e.g. I think that I would like to use this system frequently; I found the system unnecessarily complex). The researchers also added items that they formulated on their own to get further insight from the respondents regarding the prototype's usability (e.g. I did not run into any problems/errors while using the prototype; The prototype is able to do what it is expected to do). These items also follow the structure of the SUS (retrieves respondents' agreement on a scale of 1-5). To measure the usefulness of the flexibility feature of our application presented in the paper prototype, the researchers have formulated statements upon which respondents will input their level of agreement, just like with the SUS.

Based on their performance on the tasks, the various measurements we gathered during said tasks, and their answers to the questionnaire, the researchers will evaluate the usability of the prototype and the usefulness of the flexibility feature it represents.

Appendices

Script

Good Morning/Afternoon/Evening! I am Kyle Victoriano from 3 BS CS. First of all, thank you for lending a bit of your time to participate in our research. We are conducting a usability study on our automatic scheduling app prototype in fulfillment of our requirements for our Human-Computer Interaction class under the guidance of Mrs. Jenilyn A. Casano.

The study will take place here remotely using the Zoom or Google Meet platform. Prior to this call, you have been given access to a powerpoint file containing the interactive paper prototype of the app. In this testing, you will be asked to perform a series of tasks on the prototype, and afterwards, a questionnaire will be given to you for you to accomplish. During the testing process, data such as the task success rate and elapsed time to complete the tasks will also be collected. The synchronous testing process and answering the questionnaire will take approximately 30 minutes and 10 minutes respectively.

We would also like to inform you that this meeting will be recorded so we can better review the results of the usability test. Will you be comfortable with that? [YES/NO]

We are assigning the participant number **(give number)** to you. Rest assured that information such as your name and other personal information will not be collected by our team and that other forms of data that you will provide will be strictly confidential.

The Project Team will take note of the number given to the participant.

If you are ready to begin, please let us know. [READY/NOT READY]

So, to begin, I'll describe the general functionality of the application to you briefly. We designed a paper prototype of one of the features of a scheduling app that will automatically schedule events based on your free time and preferences. Keep in mind that our target users are only the college students of Ateneo de Manila University. After importing the tasks from Canvas or inputting them manually, the app will already schedule them depending on the preferences you've set, and it will create a push notification to remind you of the task it scheduled for you.

What we will present to you is a paper prototype of the flexibility functionality of our app idea. One of the pain points we got from our user research is the inconvenience of rescheduling an event or task using other apps. This prototype seeks to solve that issue using a few different ways.

Send the PowerPoint file of the paper prototype to the participant.

Now, please open the Powerpoint file that was sent to you. In there, you will see the interactive paper prototype of the app. We'll go through all the slides and we'd like you to just try to identify the elements on the screen and what you think each section of the screen does.

At this point, we are now going to ask you to perform a series of tasks on the app, so may we please request you to share your screen just so we can see how you will interact with the prototype.

Tasks:

- When you see the notification, you will confirm that you will do the task scheduled for you right now. Tell the test monitor when you think you have completed the task.

- Instead of doing the task now, you want to reschedule the event to a later date but you will allow the app to automatically find another time for you.
    - Accept the prototype's first time slot suggestion. Tell the test monitor when you think you have completed the task.
    - Accept the prototype's second time slot suggestion. Tell the test monitor when you think you have completed the task.

- Like the previous one, you want to reschedule the event to a later date but you already have a specific date and time in mind on when you want to do the task. Tell the test monitor when you think you have completed the task.

Upon completion of the tasks:

We would now like to ask a few questions regarding your experience. Please know that you can be as detailed and as honest as you want for that will greatly help in our evaluation of the prototype.

1. How would you describe your experience navigating through our prototype?
2. What things did you like least with the paper prototype?
3. What did you like most with the paper prototype?
4. How satisfied are you with how this feature can help with your scheduling?
5. How do you think this can be improved?

Send the Usability and Usefulness Questionnaire to the participant.

Finally, may we request you to answer this usability and usefulness assessment questionnaire to conclude this session. Let us know if you have questions and clarifications for the items in the questionnaire.

The Project Team will verify if the questionnaire has already been submitted.

Now that that's done, we would like to express our deepest gratitude for your participation. With the insights you've provided, we are going to figure out how we can further improve the features and design of our prototype. Again, thank you for your time and you may leave the call now. Have a nice day.

Data Collection Instruments
Questionnaire: **https://forms.gle/ACLwbK1Wqbw6CNYB6**

Results of the Study

Usability

To determine the overall usability of our prototype, we made use of the System Usability Scale (SUS) along with a few of our own questions that we deemed would give us more of the participants' insights. Calculating the results of the SUS using the method indicated here and here presents an average score of 92.5 over 100 from our participants. According to the same source, this is above average and shows competent usability in the prototype we made.

Getting into the details of the SUS results:

Prompt	Count				
	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1. I think I would like to use this feature in the prototype frequently		1			4
2. I found the prototype unnecessarily complex	3	2			
3. I thought the prototype was easy to use				1	4
4. I think I would need the support of a technical person to be able to use the prototype	4	1			
5. I found the various functions in this prototype were well-integrated				2	3
6. I thought there was too much inconsistency in this prototype	4	1			
7. I would imagine that most people would learn to use this prototype very quickly.					5
8. I found the prototype very cumbersome to use.	4	1			
9. I felt very confident using the prototype.				1	4
10. I needed to learn a lot of things before I could get going with this prototype.	2	3			

From the results of our additional questions, every participant indicated that the prototype's design is both recognizable and consistent with other applications they have used before, pointing to Jakob Nielsen's fourth usability heuristic—consistency and standards. Four people also strongly agree that they did not run into any problems while using the

prototype, with the other one saying that he agrees. All participants also strongly agree that the prototype does what is expected of it.

We also asked all of our participants how they would describe navigating the prototype as one of our open-ended questions to get more of their specific insights. All of our participants said that the prototype was straightforward, easy to navigate and intuitive. Four out of our five participants mentioned that the rescheduling processes in the prototype were clear and not confusing. Two participants also mentioned that regarding aesthetics, the app was clean, well-designed and easy on the eyes.

Task Success

Each participant was asked to identify each element of the screen and to accurately describe each of its functions before the testing procedure. For the most part, the description they ascribed to each region of element on the screen was exact to our interpretation.

In the testing procedure, the participants were given 4 simple objectives to accomplish using the interactive paper prototype. The first objective was for confirming that the user will do the scheduled task for them. The following two were for automatically rescheduling the tasks to a later date or time. The last was for them to manually reschedule the task. All the participants successfully navigated through the app and figured out what buttons to press to achieve the desired results. The study with 5 participants recorded a 100% task success rate on all objectives, where all of them accomplished the tasks on their first attempt.

There were instances of system imprecision, as pointed out by the participants, which we believe may be a source of task failure or an obstruction to a user's experience which was the seemingly disabled 'reschedule' option. The other cases we considered negligible as we deemed them nonessential for the completion of the objectives and/or lacked adequate context to accurately describe what each element/region represented.

Time a Task Requires

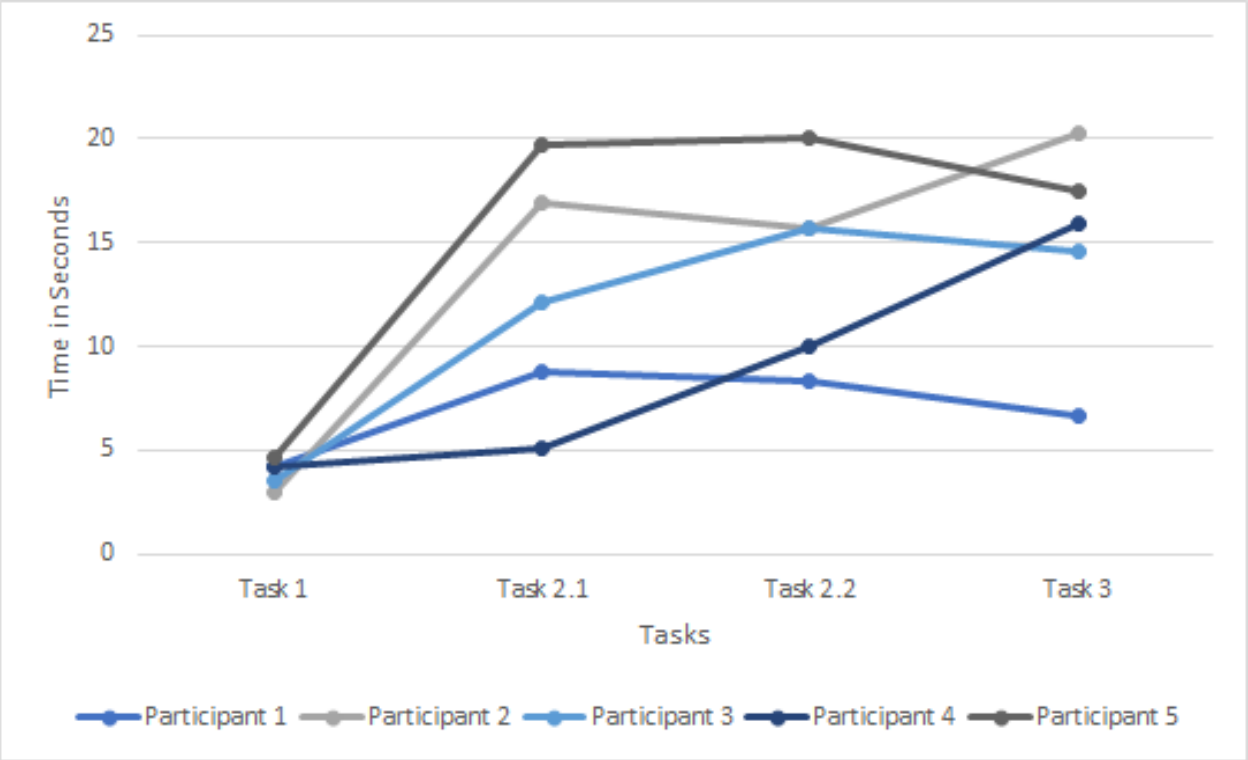
One of the other metrics that we used to measure the usability of the paper prototype is the amount of time that the tasks will require from our users. During the usability test, the elapsed time of all the participants to complete the tasks we asked them to perform was recorded by our team. The participants were instructed to inform the testers to verbally state when they are about to begin and when they think they are already done with the task. We also established a certain baseline to which we will compare our participants' time. The baseline was created by one of the researchers as the average of 5 executions of a particular task with the consideration that the user will read everything on the screen.

The baseline times identified were as follows:

- Task 1: 3.64 seconds
- Task 2.1: 11.36 seconds
- Task 2.2: 12.93 seconds
- Task 3: 12.80 seconds

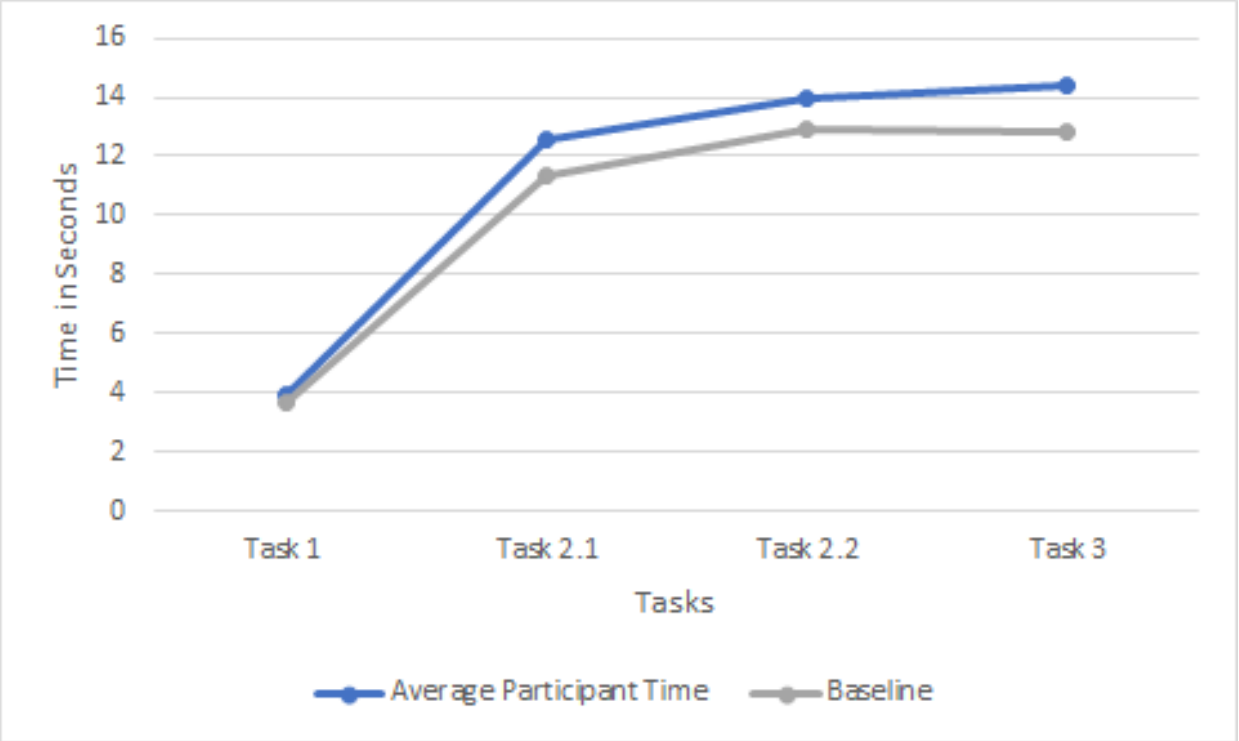
The record of the time it took the participants to successfully accomplish all their tasks as well as the participant average can be found below:

Tasks	Time (seconds)					
	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Participant 5**	**Average**
Task 1	4.2	3.0	3.5	4.2	4.7	3.92
Task 2.1	8.8	16.9	12.1	5.1	19.7	12.52
Task 2.2	8.3	15.7	15.7	10.0	20.1	13.96
Task 3	6.7	20.3	14.6	15.9	17.5	14.38



Below is the table and a chart comparing the average participant completion time to the identified baseline and its respective percentage difference.

Average Participant Time (seconds)	Baseline (seconds)	Percentage Difference (%)
3.92	3.64	7.7%
12.52	11.96	10.21%
13.96	12.93	7.96%
14.38	12.80	12.34%

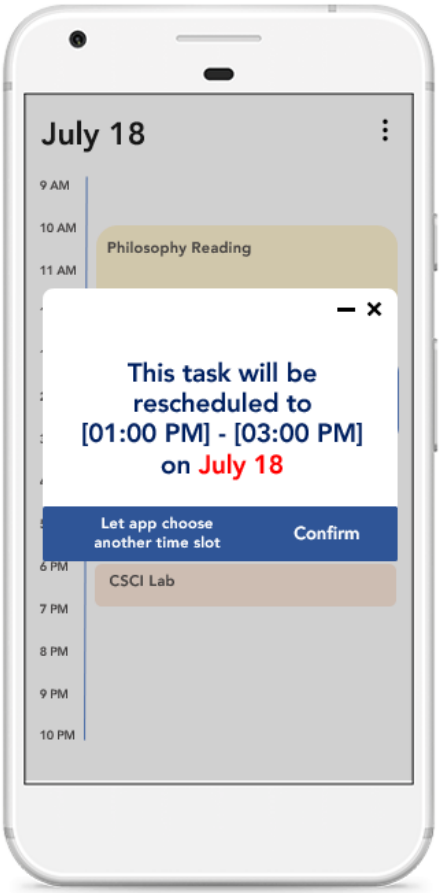


Error Rate

The error rate was used as a metric for the prototype to identify whether the current design presents itself in a way that might confuse our target users. The data used to evaluate this metric was from the number of bad entries or mistakes over the number of attempts that the participants made during their interactions with the prototype. During the usability test however, all the participants were able to accomplish all their tasks without making any bad entries giving the design 0% error rate. However, much like the 100% task success rate, it may partly be attributed to the limited number of participants involved in the study for the scope of this class. These data are very much likely to be different if larger groups of participants were to be tested.

Points for improvement

After conducting the usability test, both the researchers and participants were able to identify several points for improvement for the existing paper prototype. First, since the color choice for the reschedule button in the notification banner is grayed out, one of our participants initially thought that it was a disabled button. Another point of concern from our participants was the compression of the hours of the day making it quite difficult to see the 30 minute marks. It also became apparent that one of the weakest parts of the prototype, design-wise, was the prompted modal for the confirmation of automatically rescheduled tasks (image shown on the left). Participant number 1 specifically mentioned that the use of red font color like the one used for highlighting the date is heavily associated with the act of deletion or errors, and the use of it with that not being the intention nor the theme color of the app might confuse the users. Furthermore, the divisions of the buttons at the screen are not quite clear and the addition of a minimize button in a mobile user interface is not something very common as it is present mostly in desktop systems only. We also noticed that the formatting of time and date in the same modal does not quite present a good sense of hierarchy and emphasis that would effectively highlight the time and date shown. The increased opacity of the background behind the modal makes the change of the date shown at the back less noticeable to the users. Suggestions for changes and improvements will be explained in the discussion section.



Usefulness

To determine the usefulness of the flexibility feature presented in our paper prototype, we came up with seven statements to be measured with the Likert scale for agreement, just like in the SUS. Four out of five participants indicated that they strongly agree this feature would be useful for completing their school requirements and would make them more productive, while the other one was neutral. For whether the feature would enable them to make efficient use of their time, four participants said that they strongly agree while the other one said they agree. All of the participants strongly agree that it will save them time in terms of scheduling tasks in comparison to manual methods in other scheduling applications. Three participants strongly agree that the feature presented in the prototype will make accomplishing their tasks easier and more convenient, while the other

two agree. Four participants strongly agree that the app will give them more control over the activities in their lives, while the other one disagrees. Four participants agree that the feature will fill a gap in their scheduling while the other one was neutral.

We also asked each participant what they liked most about the prototype. Four out of five mentioned that the flexibility/auto-rescheduling feature was “easily” what they liked most, saying that they found the feature very useful and relevant in their current scheduling practices.

Usefulness: Limitations of Flexibility Feature

Through the Usability Test, we came away with the idea that although our proposed app is tailored for college students from ADMU that are in the online learning setting, the flexibility feature presented in the prototype may not serve that entire audience. From our first User Research, the pain point we got was that other rescheduling apps were too difficult to use/set up and were too limiting or constraining in terms of what a person can do in their day. In particular, the participants from our User Research let us know that rescheduling an event or task was too tedious and takes up too much time. So, we figured that an auto-rescheduling feature that allowed for flexibility would resolve the constraint issue and the rescheduling hassle.

However, one of the participants from our Usability Test was particular about how they still wouldn’t use the feature because of their inability to comply with a stricter scheduling system. To them, this feature was not too useful because of how it didn’t fit their learning style and study habits. We found that students who tend to keep a free-flowing schedule where they only do things when they feel like it may not find this feature relevant in their current practices. For those types of students, the feature would just be a hassle, and they would rather prefer checklists. For those that were willing to try the auto-rescheduling/flexibility feature presented in our prototype, however, the feature was well received and is deemed very useful and something they would definitely try out and use on the regular.

Another participant in the usability testing also mentioned that time blocking wasn’t necessarily his style, but told the researchers that he would give the feature a try if it were a real application. This participant also mentioned that this flexibility or auto-rescheduling feature that the prototype presented may sway him into the time blocking side and make him follow a more systematic, more planned out, and less easy-going scheduling practice, enabling him to get a firmer grasp of his time management regarding school requirements.

User Satisfaction

Four out of five user participants showed immense satisfaction with the paper prototype. Foremost in the contentment of our user participants was the automatic rescheduling functionality of the paper prototype, which they deemed useful. All participants stated that as college students, time is their most valuable resource. They claimed that the prototype’s functionality will spare them the tedious process of manually inputting each task to their calendar when they wish to reschedule, thus saving them time.

Secondary were its pleasing visual aesthetics and element placement. There was no difficulty navigating through the application since the process was effortless and straightforward due to its largely intuitive design. Although, it was not flawless as there were minor obstructions due to the counterintuitive coloring of certain text elements (illogical, inconsistencies), such as the grayed out “reschedule” option (which normally specifies non-clickability). Aside from that, the overall user interface design and theme were sleek, minimalistic, and up to their standards.

Lastly was the reminding system done by the system via push notifications. They saw this as a useful and effective method to counteract prospective memory failures and a method for promoting better study habits. The out-of-app accessibility it provided was also convenient as they no longer have to open the application just to be informed about their tasks.

Discussion

In terms of user satisfaction, one participant (Participant 1) showed dissatisfaction towards our prototype. However, it is not due to its poor design choice or overly-complicated processes, but rather due to discrepancies in perceived usability. That participant would rather have more freedom in terms of task scheduling and would choose to avoid restricting herself to a systematic schedule. Moreover, she had claimed that features such as this are only custom-built to specific subsets of people and are unserviceable for a more diverse range of populations with varying study and work habits.

In terms of usefulness, the auto-rescheduling feature was well-received by most of our participants (with 4 out of 5 participants choosing either agree or strongly agree in all of our positive usefulness prompts). However, the participant (Participant 1) that mentioned that this feature would mostly be irrelevant to their current practices indicated in the questionnaire that they:

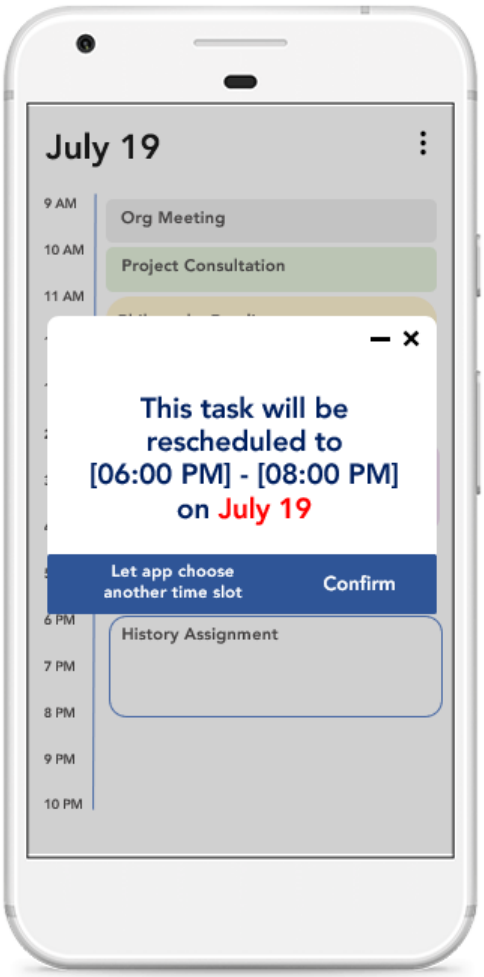
- Agree that the feature will make efficient use of their time.
- Strongly agree that it will save them time in terms of task scheduling.
- Agree that it will make finishing tasks easier and more convenient.

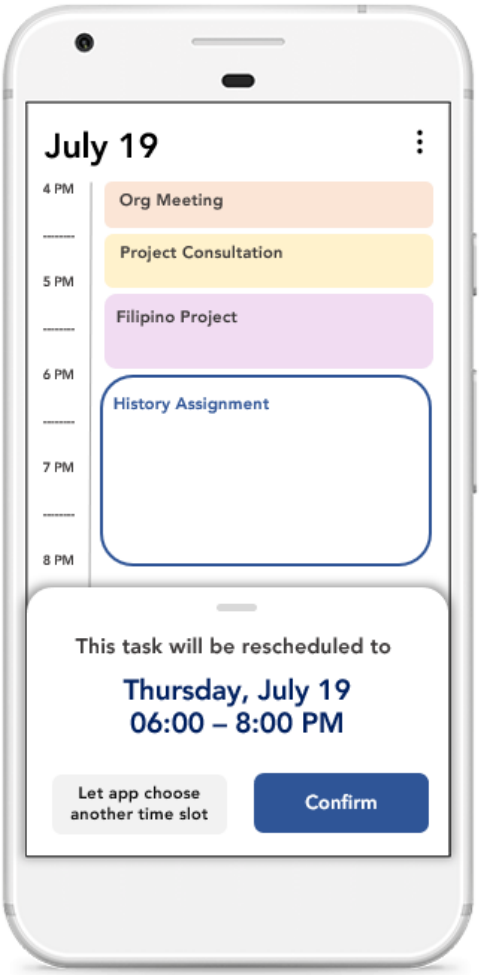
This shows, then, that the feature is inherently useful, but not worth changing study habits or an entire lifestyle over. The feature itself is not the cause of the issue, and its usefulness will ultimately depend on whether the user’s current scheduling practices to accomplish their school requirements conform to the time blocking style.

From the results of our usability test regarding usefulness, those who are already using the time blocking style, willing to try it out, or are trying to transition into it (referring to Participant 2’s thoughts) are likely to find this feature rather useful. For those who want to keep their free-flowing study habits and aren’t willing to try otherwise, however, it is likely that they will not find much of a use for this feature since they wouldn’t be time blocking in the first place.

In terms of usability, the time each task required was one of the metrics we used. The highest percentage increase from the baseline time among all the tasks was only 12.34% (task 4), with an average of 9.56% increase from the baseline time for all tasks. The second-time

viewing times recorded by our participants were within acceptable standards compared to our baseline times. These low percentage increases are also reflected in the error rate, with not a single user pressing a wrong button or making an error while navigating the prototype. Because of these and a high SUS score of 92.5/100 (and good feedback on our additional queries on the questionnaire as indicated in the Results), we found our prototype quite competent in the usability department. There are, however, some design choices where we could have done better. To address those design issues, we decided to present a revised design for one of the screens of the prototype (See the figures below).

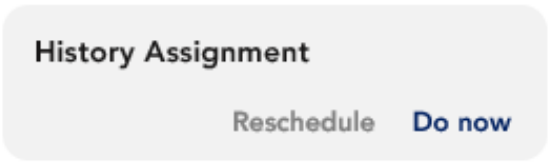




Initial design **Updated design to user satisfaction**

Some of the participants raised specific concerns regarding the initial design of this screen and one of those is the lack of emphasis of the time and date. We solved this problem by creating a more visible distinction between the text above it and the time and date to when the task will be moved. The color of the date was also changed from red to the shade of blue used by the app to prevent the users from associating the text to an error or something that is of immediate importance as suggested by one of our participants. Another concern that was brought up was the lack of separation between the buttons present on this screen, so we decided to make distinct outlines for the two buttons and even changed their color to

highlight the primary button and a less prominent color for the secondary button that presents more options to the users. The addition of the minimize button was also identified to be a possible source of confusion as it is not very common in mobile user interfaces. The idea behind its addition however is to allow the users to view the date and their schedule for that day before they confirm to reschedule the event. So, to address the issue without forsaking the thought behind it, we just moved the prompt to the bottom of the screen instead of having it be like a modal. Now, if the user decides to scroll through their screen to look at their schedule for the day, the prompt can automatically hide itself and reappear when the user presses or slides up the pill button. This change also solved the problem that one of the participants mentioned regarding the opacity of the screen underneath the modal design as it made it difficult to notice the change in date if the task will be moved to a later date. With the new design, it's much more noticeable and some animations can even be added to highlight the transitions. More so, we decided to make the time markers less dense to make half-hour markers visible as suggested by some participants. It was also mentioned that the grayed out color of the reschedule button in the notification area looked like it was a disabled button and so it will also be changed to have a darker color to avoid further confusions.



Old Reschedule Button Color

Updated Reschedule Button Color

Now, perhaps the biggest concern after this change in the prototype's visual design is the consistency of the user interface throughout the app. Since we were already able to identify the lapses of our previous design, we are willing to base the interface of the other screens from the design presented above such as the distinction of buttons and the standardization of the colors and shapes. The initial idea for its design will definitely still be present since the changes will only be made to certain elements to further enhance the usability of the prototype and to better serve our target users.

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