

Perfect Timing

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Problem & Proposed Solution

In our busy society, good time management is a must. Many people do their best to plan out their daily tasks, but consistently fall behind schedule, fail to get everything done, or simply can't find time to plan consistently. Though there exists time management applications, we found that these rely on users to already be good at time management. These applications are more often a tool that holds information, such as a schedule, instead of a solution which actually helps users plan their time. As we have studied this problem, we have found that one of the most heavily affected populations is college students. Students are a uniquely busy population because in addition to attending classes and completing course work, many of them have jobs and personal obligations through family and friends. One of the unique and challenging components of time management for these students is that they are only partially in control of how they can schedule their time. As a solution to this we propose a time management application that will minimize manual data entry and provide the individual student with thoughtful calculations to help them schedule their time. The solution will have the ability to import already existing events from other sources, such as a school website or Google Calendar, to avoid duplicate entry by the student and provide a single centralized calendar. In addition to basic features like reminders, another main feature will be the use of course and personal statistics to calculate a recommended time to allot for specific assignments. Statistical data for course assignments will be collected from the time logs of many different users and uploaded, which will allow other users to see how much time it usually takes to finish these assignments, and they can then schedule their own time appropriately. In order to motivate students to provide their data, they will not be given course statistics or recommendations for how to schedule an assignment if they are not consistently providing their own data. An intrinsic motivator to log time will be that if they are not logging their time properly, the recommendations they do receive would not be accurate and therefore not helpful to them.

Contextual Inquiries

Participants

Matt, our first participant, is a full-time Computer Science student who juggles schoolwork, two part time jobs, and church responsibilities. He's often busy enough that he has to plan for nearly every hour of the day in Google Calendar in order to make sure he gets everything done on time, and to find any time that he can use for other pursuits. The contextual interview took place in his living room as we watched him use the Google Calendar app to plan out his time for the next day. As he was planning, he expressed frustration at the inability to set alarms directly from his calendar, which he ends up setting manually in order to remind himself to switch tasks. He also wanted to be able to set task priorities within his calendar, so that when events overlapped one would take precedence, and so he could track how well he was focusing his time on his priorities. He liked the idea of an app that would augment what he already uses, pulling in data from his calendar and other sources.

Derek, our second participant, is a part-time Computer Science student who works for the U as part of an Internship. Derek does a lot of day-to-day planning, but he manages it largely in his head rather than planning things out in writing. We chose Derek as a participant because managing his time is very important to him, but he doesn't use conventional tools to do so. As part of our inquiry with him, we asked him to think aloud to us about his upcoming weekday. We took notes as he spoke and asked him questions about parts of his planning process that were unclear. One interesting observation we made was that Derek prioritizes his homework schedule by reading through an assignment when it is first posted, and trying to do some work on it. From this Derek gauges how difficult the assignment is to complete and prioritizes it accordingly. During the next day, we sent him emails that he responded to, reporting to us how he was doing with his plan. At the end of the day we met with him again to do a recap of the day and find out how everything went. Overall he had a very good day despite a few surprising changes that came up with his internship schedule. We largely concluded that rescheduling according to changes in the day is a very difficult challenge that many people face when managing their time.

Jacob was our third participant. He is a systems administrator for a small company. He is very busy handling the persistent needs of the company. He is often interrupted with technical issues. We were interested in interviewing a business professional and seeing how they manage their tasks at work. For this reason, we interviewed Jacob as he arrived in his office so that he could schedule his day with us. He expressed his frustration with existing current task management software solutions because they take too long. For this reason, he sometimes uses post it notes as reminders for tasks that he sticks to his computer monitor. He can create

and get rid of a task on a sticky note in a matter of seconds. Since Jacob is basically on call to anyone on the company he revealed that he doesn't schedule many tasks at a specific time. He is constantly being interrupted during the work day.

Results

We observed three common themes among our participants.

1. The need to figure out how long a task will take. As people attempt to schedule events in their day, they often revealed they were guessing at how long to allot for some tasks. Estimates were usually made from previous experiences with the task but this requires the user to accurately remember an event that may have occurred more than a week before.
2. We learned that our participants don't want to spend very long using a task management solution at a given time. We estimate that between our users they want to manage a task in under 10 seconds. They have negative feelings towards time-consuming manual data entry. All of our participants exhibited behavior that suggested data entry into existing applications takes too long. When scheduling for the day, the participants had a rough plan of tasks that was easy to compile but were more challenge with the process of planning a schedule with the list of tasks. Related to the ability to make a schedule quickly, we noticed that interruptions were inevitable in the participant's days. When this happened the participants had to do some form of rescheduling to get their day back on track.
3. Data entry needs to be fast. We must design this to be a quick process with the availability to have as much automation as possible. Based on our observations, we can conclude that if this is not a central consideration for our design, it may cause users to stop using the application. Rescheduling events based on an interruption should be able to be done even faster than the original scheduling. This is because if the user has already lost time due to an unexpected event, they will be hesitant to do anything else that puts them further behind schedule. Lastly, the design needs to include a way to help the user track time spent on tasks. This will ease their future planning as they can rely on looking this information up instead of trying to remember it and may increase their productivity since they will be able to build a more accurate plan.

Task Analysis

Who Will Use the Design?

We anticipate that our solution will be mostly used by busy college students.

What Tasks Are Performed Now?

Currently entering recurring events, adding new events, setting alarms, and reprioritizing events are all common tasks performed. More abstract tasks include determining how much time to allot for a task and determining when to work on a specific task.

What Are Desired Tasks?

Our contextual inquiries revealed that calculating and assigning priorities on tasks, importing events, setting long term goals, viewing progress, and entering actual time spent are all desired tasks in this project.

How Are the Tasks Learned?

Based on previous use of other applications. Most of these tasks currently performed are intuitive to a college population. We will seek to maintain this aspect in any new tasks offered.

Where Are the Tasks Performed?

Time consuming tasks such as entering recurring items may happen at a desk on a computer, but we expect that daily planning and adding individual events will likely happen on a mobile device. The physical space these tasks can happen is virtually unlimited, since people frequently take their phones everywhere with them. Abstract tasks such as calculating time for a task may even be done mentally, without a physical device.

What is the Relationship Between Person and Data?

Most of the data is personal, as it consists of events catered to each individual. However, some may have common data if the individual chooses to import events or synchronize calendars shared with or made by other people.

What Other Tools Does the Person Have?

Our participants that scheduled their tasks used Google Calendar. They also use phone alarms. The others used note taking apps or paper notes and planners. For the abstract tasks, our participants did not use tools and instead relied on their memory.

How Do People Communicate With Each other?

We target individual users, so communicating with other people is not a large component of our solution. Interaction may happen when people import events or other calendars made by other people.

How Often Are the Tasks Performed?

Some tasks are performed as often as every few hours. This includes adding single events or rescheduling and reprioritizing. Other tasks will happen infrequently, perhaps once a month or every few months. This includes recurring events and setting alarms.

What are the Time Constraints on the Tasks?

Users need to be able to add/remove/reschedule tasks quickly enough that it doesn't become too much of a hassle for them. This is a time management app that should not be time intensive to use. The progress review portion of the app would not have the same constraint as people can review their progress at their leisure.

What Happens When Things Go Wrong?

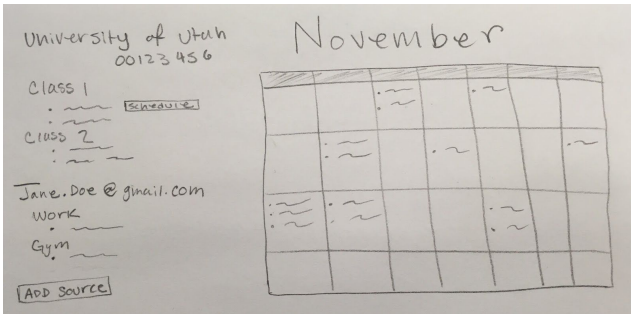
Calendar data can fail to sync back to calendar sources. In this case, a user may miss scheduling a task all together which could lead to higher stress levels for the student. In the worst possible scenario, all data would fail to sync the application would be rendered useless. It is also possible that people could incorrectly mark when they are completing an activity, or when an activity is finished. This may lead to users getting inaccurate recommendations for how much time to allow to a task. If this occurs, the user may find that they have either overscheduled themselves or under scheduled themselves and potentially waste time.

Proposed Designs

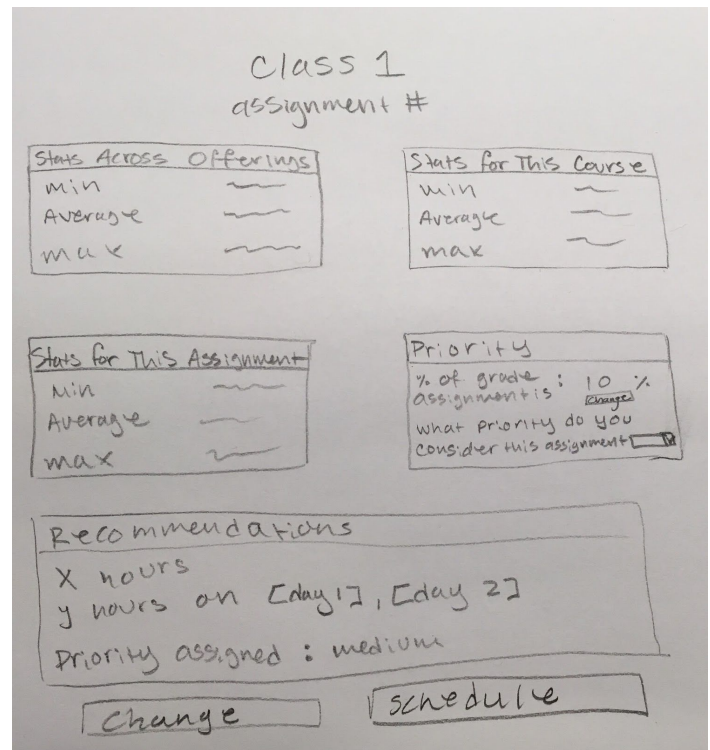
Design 1

This design is focused on outsourcing as much information as possible to help minimize data entry on the user's part. Scheduled events and tasks from other apps may be imported into one main calendar. A particularly interesting feature of this design is that the student is able to do this import process with their academic institution, in addition to other list and calendar apps. This will take information such as what classes and sections they are in, and assignment information for their specific classes and sync it into the app. The app will also utilize information from the institution, polled data from students in the user's courses, and the user's data to generate recommendations for scheduling. In order to motivate students to provide their data, course statistics and recommendation features will be limited if the user does not provide their data.

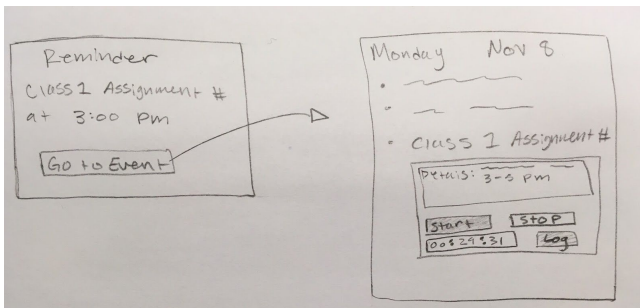
Task 1: Make a Schedule from a list



Task 2 & 3: Determine how much time to allow for a task & set the priority of a task

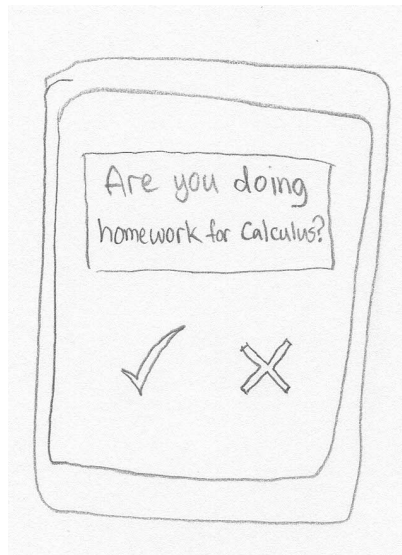


Task 4: Accurately track time spent on task

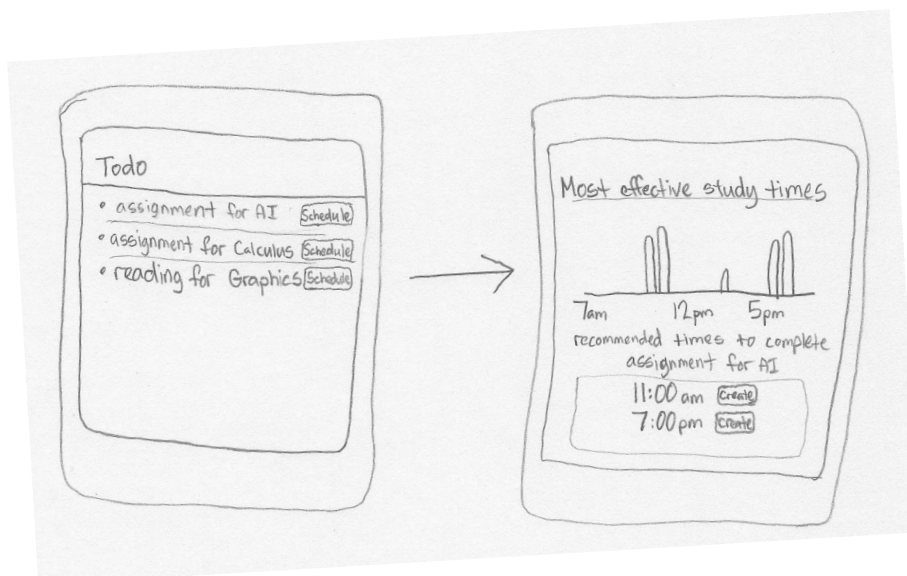


Design 2

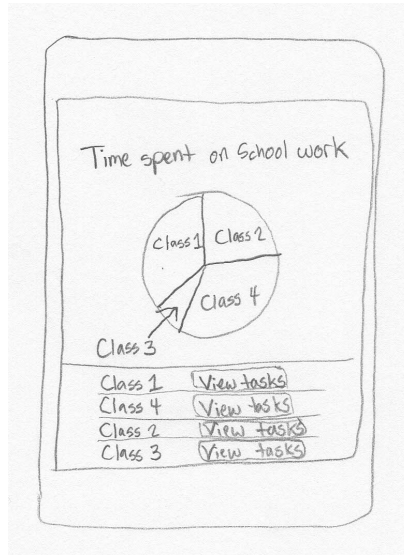
This design, inspired by our first contextual interview, focuses on reporting information to the student so that they are enabled to schedule their tasks. As the student interacts with the application, data is gathered that is used to generate charts and graphs that help students that have an interest in their schedule habits. Based on the need to gather data, there needs to be a way for the student to track if they are on task or not (Task 1). The student can have a list of tasks that they need to complete (Task 2). They can select a task to schedule and some historical or statistical information would be used to generate several graphs or charts that would assist in scheduling a task (Task 3). At the forefront of the design is a reporting section that shows things like: the amount of time spent doing school work (by class), how effective time is being spent, busiest parts of the day, etc.(Task 4).



Task 1: Accurately track the time spent on a task



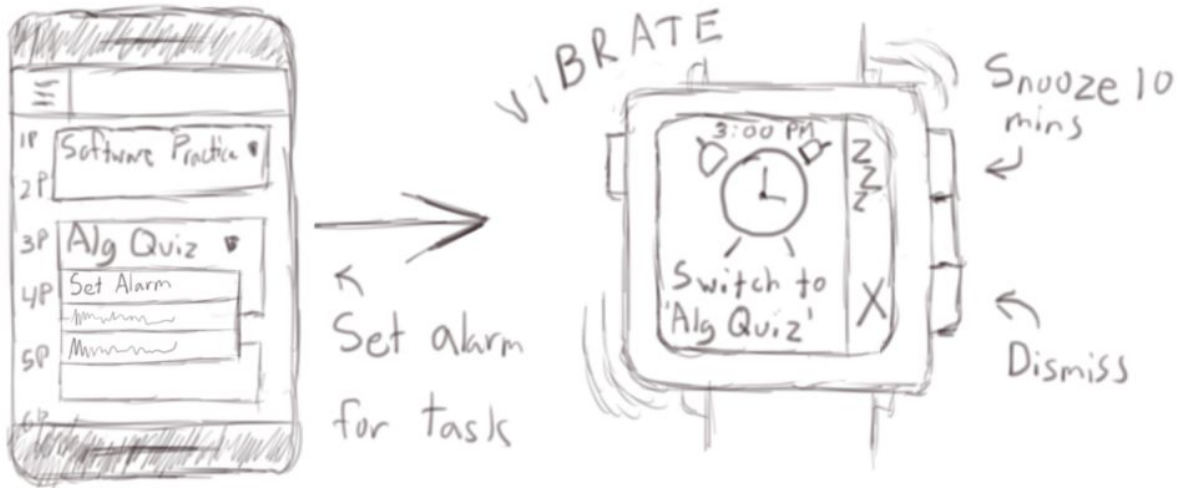
Tasks 2 & 3: Make a schedule from a task list & Set the priority of a task



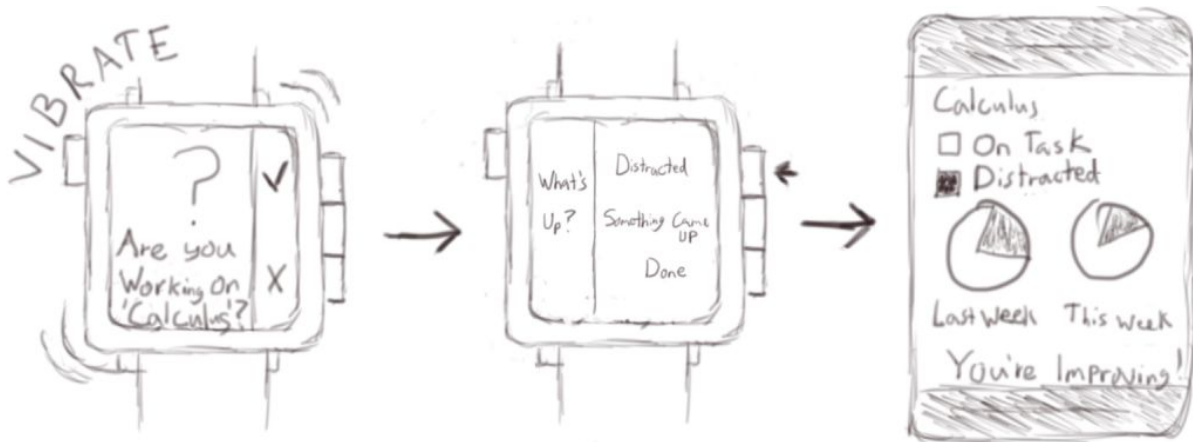
Task 4: Determine the time to allot for an event

Design 3

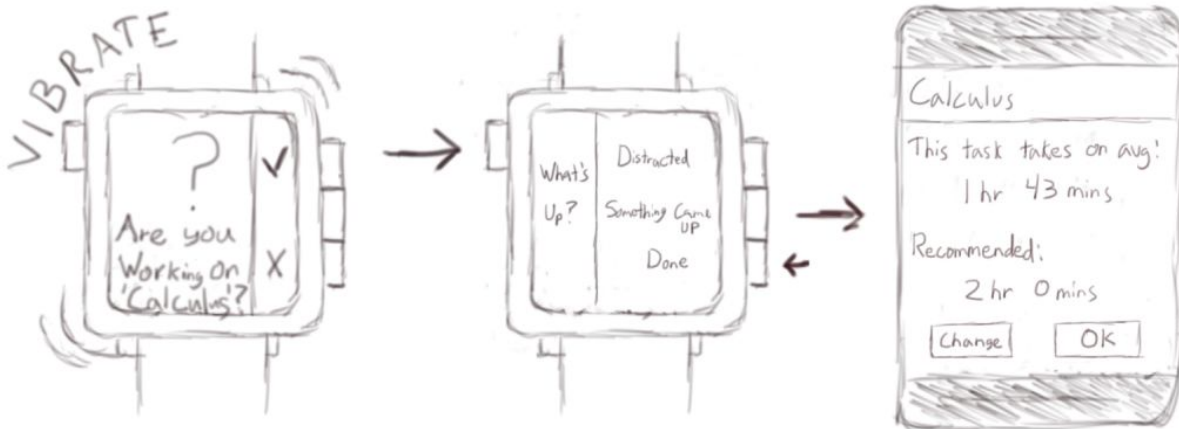
This design focuses on tasks that can be made more convenient when a mobile solution is paired with a smartwatch. The particular advantage of using a smartwatch is that alerts and check-ins can be sent to the user in a minimally intrusive way, and do not require the user to pull out their phones in order to interact with these features. The following examples use a Pebble Time as the example smartwatch. A user can set alarms from their smartphone reminding them when to switch to their next task, and can snooze or dismiss this alarm from their smartwatch (Task 1). The app can check-in on users via the smartwatch to see if they're staying on task, reminding them to get back on track and helping them see a statistical average of how often they get distracted (Task 2). With these check-ins, it can also determine on average how much time users spend completing certain tasks, helping them to allocate time appropriately for those same tasks in the future (Task 3 & 4).



Task 1: Transition between tasks effectively



Task 2: Staying on task



Task 3 & 4: Accurately track the time spent on a task & Determine the time to allot for an event

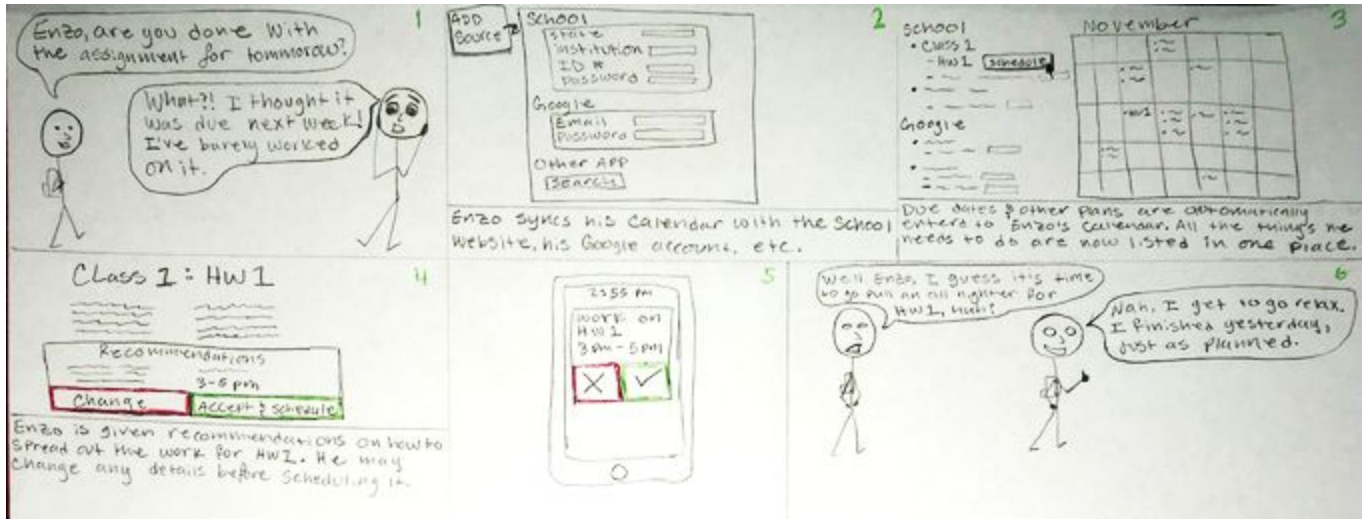
Design further pursued: Design 1

We decided to pursue design 1 because it addresses two problems which we discovered were very important during the contextual inquiries and critiques. During these activities we observed that manual entry was the single most important hindrance of any existing or proposed time management solution. Design 1 allows for maximum automation when scheduling events by importing data from other sources where the events have already been defined. This allows the user to have one main calendar, without having to do the manual entry of each event. The other important factor in choosing this design was its ability to assist the user in determining how much time to spend on a task. Planning a schedule largely revolves around this, yet our contextual inquiries revealed that it is a complicated process, particularly for schoolwork. This design allows for a calculation of time required for assignments to be made based on many different factors but without much thought, or time, on the user's part.

Selected Design

Scenario 1: Making a schedule from a list of tasks

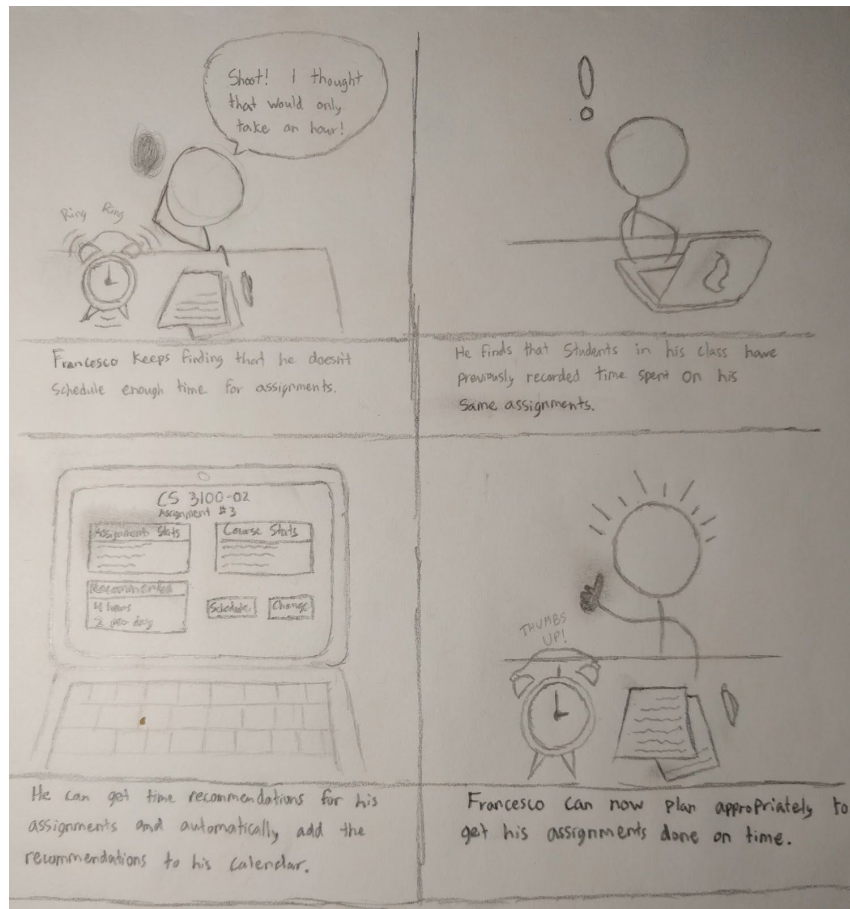
Storyboard



Enzo is a Computer Science student at the University of Utah and employee at a nearby tech startup. At the beginning of the semester, Enzo logs into Perfect Timing. He adds the University of Utah as a source for events by entering the institution and his CIS credentials. At the same time he provides his Google account credentials so he can sync his work schedule from the company's shared calendar. Enzo now has a list of assignments he needs to complete with their due date already marked on his calendar. Enzo begins by scheduling time to work on his first homework assignment. Perfect Timing suggests a schedule for Enzo to follow so he can get the assignment done on time. He accepts this recommendation and is reminded the following day with a notification when it is time to work on this homework. At the end of the week, Enzo is not stressed because he has finished the assignment on time.

Scenario 2

Storyboard



Francesco is a Computer Science student at the University of Utah. When Francesco is ready to schedule his weekly assignment he logs into Perfect Timing. He clicks on the current weeks assignments and sets the priority as medium because this is an important class but he has a bigger project to work on this week for another class. Perfect Timing calculates that six hours will be the time it takes Francesco to finish this assignment. Perfect Timing looks at the calendar and notices the due date is five days away and Francesco has nothing but class scheduled for the next three days. It recommends that Francesco works on this assignment for two hours, 2:00 pm to 4:00 pm, for the next three days. Enzo reads this recommendation and thinks it will work for him, so he clicks schedule and Perfect Timing puts the recommendation into his calendar.