

Busy Bee

The bee-utiful productivity companion!

Group 20's final project for Dr. Hao-Chuan Wang's Winter 2024 ECS164 class.

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ABSTRACT

Our goal throughout this project was to create an application that helps improve productivity. To do this we went through four phases of design: and decided on an application that is an all-in-one environment to help improve productivity. We then did research on different productivity methods and developed two different personas to help us decide on what tools/features the application could include. The idea that the application was built around was to minimize distraction from the user's phone. The features that were decided upon were a pomodoro timer, a calendar, and the main feature was a tool that allows certain applications to be locked so the user can't access them for a set period of time. After deciding on the features, we built a low-fidelity prototype that showed all the pages of the application in a simple design, and then built on that to create the high-fidelity prototype using Figma.

1 Introduction

The broad problem we were looking at was to create a product to help with productivity in some way. We narrowed it down to developing something that helps deal with procrastination and distractions because increased demands in our world now causes us to overlook certain tasks and miss deadlines. Also many people are forgetful and have poor time management skills due to having so much on their plate and also because of the amount of distractions around us. Everywhere we look, some sort of distracting website/applications are only a click away on any device. Especially now with the introduction of TikTok and more short-form content on social-media sites, it's easier now more than ever for users to become distracted causing them to procrastinate.

Our aim is to improve the way individuals manage their daily tasks by providing a product that tackles everything from academic tasks to household responsibilities. The way we did this was by creating an application that's main features are a pomodoro timer to allow the user to work in set intervals without distraction, a calendar to keep track of completed and uncompleted tasks, and a tool that allows

the user to block certain distracting applications from being opened like TikTok or Instagram so that they don't cause the user to be distracted and procrastinate. All these features are integrated together, so that it allows the user to keep track of their tasks and work on their task without the constant distractions. So whether it's meeting project deadlines or remembering to put away the dishes, our design provides a versatile solution that caters to people looking to take control of their busy schedules.

Week 5	Proposal Due. Conduct project research and begin delegating tasks.
Week 6	Recap through the Empathize, Define, and Ideate stages of the design process. Get a clearer idea of potential implementations and challenges for our project.
Week 7	Milestone 1 - Have a clear feature plan and sitemap of our app.* Begin prototyping.
Week 8	Progress Report Due. Continue work on the app, with a couple planned sprint meetings.
Week 9	Milestone 2 - Have a working prototype of our app.* Begin testing.
Week 10	Oral Presentation. Get Busy Bee to a finished, publishable state.

* Milestones will be completed by the end of the week.

Figure 1: The planned timeline for our project

2 Background

Scientists refer to "State of Flow" as deep focus and immersion in a task.^[1] Smartphones with frequent notifications and the tendency of users to check them constantly, disrupt this state of flow, which is essential for productivity. Even brief interruptions as short as 2.8 seconds can disrupt concentration and increase the likelihood of mistakes in cognitive tasks.^[1] Many people tend to spend more time on their smartphones at work than they consider optimal, this indicates a gap between intended and actual use. The average smartphone user interacts with their phone approximately 85 times per day^[2] - and this number only increases with time. This constant engagement implies a significant cognitive cost,

particularly in terms of productivity. Even strategies like turning the phone face down or switching it off do little to mitigate this attentional drain, as our awareness of pending notifications still reduces our capacity to concentrate and perform tasks. This impact is most pronounced in individuals who are heavily dependent on their phones, with their presence in the work environment causing the greatest distraction.

Due to the nature of the problem we are tackling, our design will inevitably be working first-hand with users in already stressful situations. We therefore made it a goal to research how best to utilize emotional design to make our app as comforting yet energizing as possible. One particular point we found was the effect of color on the user's perception of time. "Under a red-light objects seem heavier and longer and time seems to pass slowly. On the other side, under a blue light objects seem lighter and smaller and time seems to pass very quickly."^[3] In addition, it is well-known that lighter, more natural colors like yellow, green, and blue are considered "happy" colors, while darker colors like red, brown, and black invoke the opposite emotions.^[3] Wanting to make a design that is both relaxing yet motivating, we as a group decided on a color scheme of pastel yellows, greens, and blues that could produce this effect. One concept we also started talking about fairly early in our design process was the use of a mascot, which would make our app more personal while keeping it comforting yet exciting. We have decided upon a cute, simplistic bee design, as bees are known for their productivity.

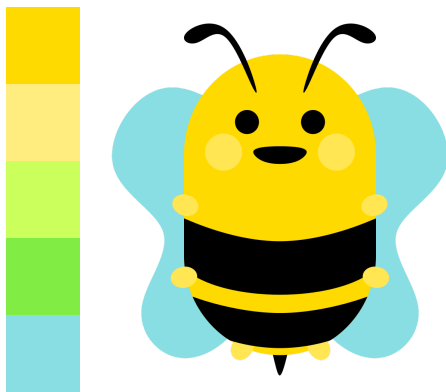


Figure 2: The color palette and bee mascot that would eventually be implemented into our design

3 Design Methodology

For our design process and method, we split it into four separate phases: ideation and feature brainstorming, feature selection, constructing the low-fidelity prototype, and finally constructing the high-fidelity prototype with FIGMA. First, we brainstormed using our past experiences

with using productivity tools and identified features that were helpful in our experiences and which ones were not. From that brainstorming session, we were able to get a list of features we were interested in implementing and moved onto the second phase: feature selection. We wanted to keep the app focused and streamlined, so we decided to exclude the chore chart component we initially considered. By having a separate brainstorming and then feature selection process, we were able to express our creativity and explore new ideas as a team, and then keep the final product concise and focused on one center goal with a separate feature selection phase.

After we as a group were able to narrow down the list of features we wanted to use to tackle our mission of procrastination, we were able to build our low-fidelity prototyping. To encourage collaboration and keep the project open to new ideas as we continued working, we split the prototyping into two parts: low-fidelity and high-fidelity. On an online collaborative whiteboard, we were able to see how our features from the previous phase would fit together. After our initial draft of the low-fidelity prototype, we stepped back and assessed the usability and effectiveness of our current product. It was through this analysis that we realized that having a pomodoro timer alone would not be optimal. Instead, it would be most effective to have a general study timer and a pomodoro timer. If we had gone straight from the initial brainstorming phase to the high-fidelity prototype, the idea of having a separate pomodoro and general focus timer would not have been realized since changing the layout of the product once the final prototype had been made would have been time consuming and difficult.

Finally, after we as a group felt confident in our product being able to effectively tackle procrastination, we moved onto the high-fidelity prototype. Because we already had an outline with the low fidelity prototype, we were confident in it, the process of knowing what to build in the high-fidelity prototype was relatively frictionless. Thus, having already created the low-fidelity prototype gave us the time to focus on design and making the product visually appealing while creating the high-fidelity prototype. Thus, by having separated the design process into four separate phases, it allowed us as a team to explore different creative features, keep tuning and refining each feature until we were satisfied, and in the end, combine all of our work together and create a visually appealing product with a cohesive design that effectively combats procrastination.

4 Target User Interviews

Before starting our need findings, we decided that our target users would be college students who need to tackle

tasks outside of school. We interviewed 13 participants all ranging from 18 years old to 25 years old. All the 11 out of 13 of the participants have jobs outside of school.

4.1 Interview Results

4.1.1 Productivity Tools Usage. Participants primarily use laptops or smartphones for task management for school and/or work projects. Additionally, 61% of participants said that they occasionally consider using the traditional pen and paper method.

4.1.2 Challenges and Motivations. We found that 85% of participants mentioned procrastination and smartphone distractions as a primary obstacle to staying organized and productive. In order to stay motivated, 70% of our target users expressed a desire to enhance time management skills, increase productivity and alleviate stress by meeting deadlines.

4.1.3 App Usage Preferences. Participants indicated a preference for utilizing productivity apps primarily for academic or work-related tasks. Specifically, 70% favored features such as time tracking or Pomodoro timers, alongside reminder and calendar functionalities for impending deadlines. When it came to collaborating with others on tasks, 77% reported working on tasks independently.

4.2 Data Analysis

From these interviews, we gained insight from our target users on what functionalities we need to focus on that cater to college students and full-time workers seeking efficient task management solutions. Notably, participants emphasized the significance of timely reminders to mitigate forgetfulness regarding assignments and project deadlines. Accordingly, integrating reminder notifications into our app is essential.

To address problems regarding procrastination and distractions, we propose implementing a feature allowing users to ‘blacklist’ distracting apps for a set amount of time. This would ensure that the user can focus on their tasks and block them from getting distracted on their social media apps. Additionally, simplicity in app design is prioritized to minimize distractions. Furthermore, aligning with user goals of improving time management and productivity, we plan to include a timer and to-do list feature to facilitate task completion.

5 Conceptual Model

Our design aims to solve the problem of distraction from phones. It solves this problem at a low level by simply locking distractions out of the user's frame of view. At a

high level it provides an engaging platform for users to interact with that promotes productivity and deep focus. Through our previous research we found that users are often most distracted by the quick dopamine release through social media or short term content. By blacklisting these applications from their phone within the app, there is a hurdle users would have to go through in order to access these distractions, which demotivates users to jump that hurdle at all. Receiving messages or notifications while studying was also found to be distracting and will not allow deep focus, which is why we decided to have Busy Bee mute all incoming notifications from third party apps.

6 Prototyping

To start with our title screen, home page, and our sidebar view seen in figures 3, 4, and 5, we wanted to focus on key design heuristics like visibility of system status. The home page displays the user's current tasks and the total time studied, providing clear visibility into the system's state and the user's progress. We provide a clean and uncluttered workspace which is shown to increase productivity and reduce cognitive load.



Figure 3: The low-fidelity (left) and high-fidelity (right) design and layout of our title / login screen

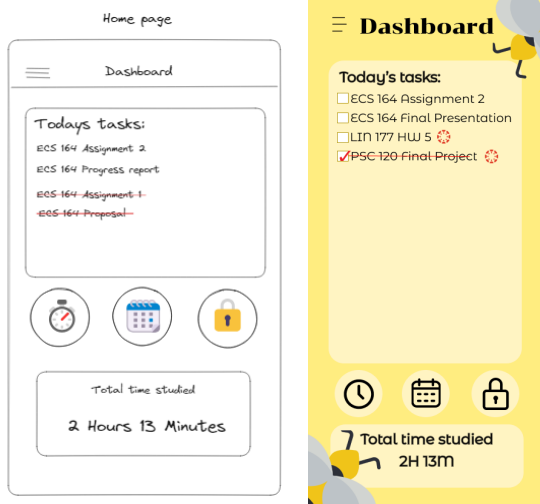


Figure 4: The dashboard / home page



Figure 6: The pomodoro timer page

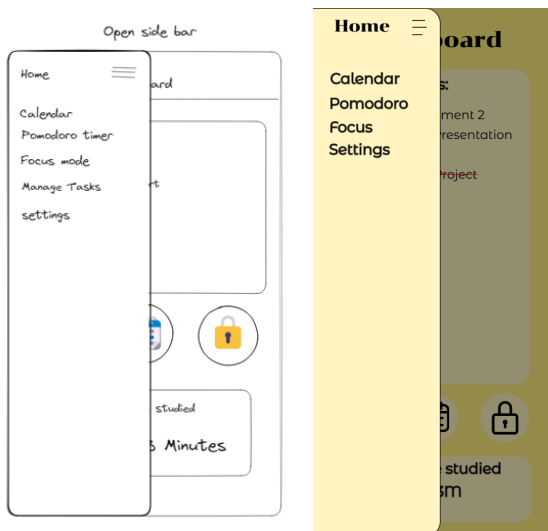


Figure 5: The sidebar page

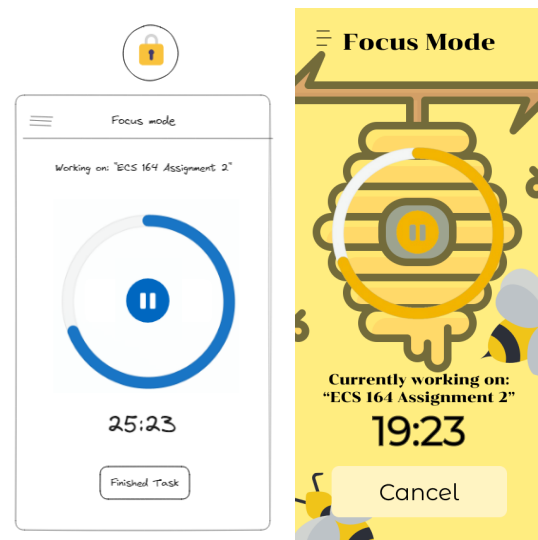


Figure 7: The focus mode timer page

The Pomodoro and focus mode timer screens seen in figures 6 and 7 respectively prioritize aesthetic and minimalist design principles, presenting a clean and uncluttered interface with only essential elements. This approach reduces potential distractions and cognitive load, allowing users to concentrate on their work without unnecessary clutter. The inclusion of a dedicated focus mode caters to the heuristic of flexibility and efficiency of use, enabling experienced users to work in an uninterrupted environment tailored for productivity.

Both the calendar seen below in figure 8 and the focus mode/Pomodoro timer interfaces above showcase the heuristic of user control and freedom. The calendar allows users to add, modify, or remove events, giving them control over their schedules. Similarly, the ability to customize and tailor the focus mode settings empowers users to personalize their experience according to their preferences. Additionally, the visual representation of tasks and events on the calendar aligns with the recognition rather than recall heuristic, reducing the cognitive burden of remembering commitments solely from memory.

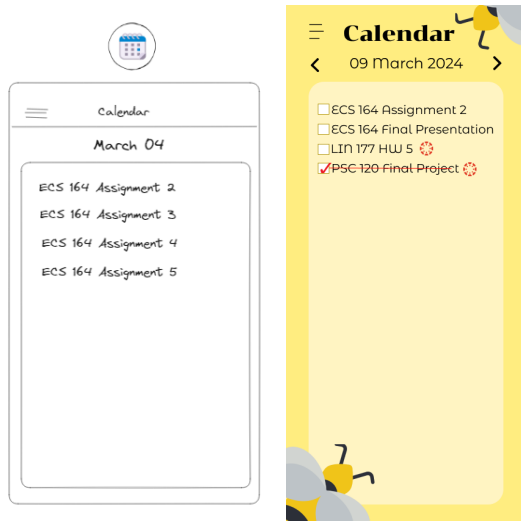


Figure 8: The calendar page

The "Settings" screen below in figure 9 upholds the principle of user control and freedom by providing customization options, allowing users to customize lockouts from the app according to their individual preferences and needs. Additionally, the use of common terminology and layout conventions for the settings interface promotes consistency and standards, ensuring familiarity and a recognizable experience that aligns with users' expectations from other apps and platforms.

The "Manage Tasks" screen also seen below maintains visibility of system status by clearly displaying users' tasks and their respective statuses, keeping them informed about their ongoing work and commitments. The ability to manage tasks by adding, editing, or prioritizing them caters to the heuristic of flexibility and efficiency of use, accommodating different user needs and work styles. Crucially, this screen grants users control and freedom over their tasks, empowering them to organize and manage their workload effectively.

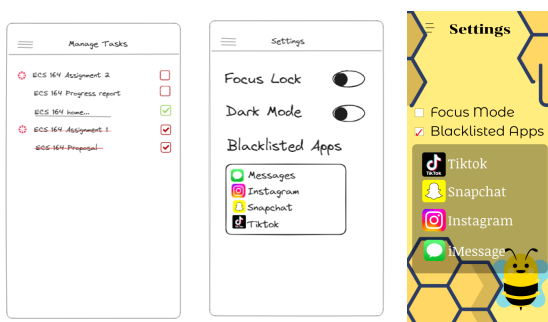


Figure 9: The Manage Tasks and Settings pages

7 Discussion

Initially, our objective was to develop an app that integrated household chore management with academic assignment tracking. However, following the extensive needfinding, we prioritized school-related tasks over household chores among users. Consequently, we made a deliberate decision to pivot our project towards class assignments, with the option to include other tasks, like household chores, if desired by the user. This change was motivated by our goal to cater the app's functionality to our target users, making it more user-friendly and intuitive.

While our project was guided by the personas created from our interviews, we acknowledge the missed opportunity for feedback post-prototyping. Feedback after our prototyping would have helped us immensely in improving our product and making it cater to our target audience. Regrettably, time constraints hindered our ability to solicit feedback from our target users on our high-fidelity prototype. We feel that gaining user feedback after our prototype would have been extremely helpful in understanding how the user would interact with our model and would have made our project more meaningful to our target users. We learned that gaining user feedback is just as important as the need-finding process. Without the use of feedback for our high-fidelity prototype, we noticed some issues that could have been improved with the user in mind.

8 Future Work

Acknowledging the immense value we would have gained through user interactions, we aim to dedicate ample time to user testing in future works. This feedback would allow us to pinpoint blind spots and enhance our design, leading to the development of a more efficient productivity app tailored to user needs and preferences.

With that said, there are a couple of improvements we would like to make based on our observations of the high-fidelity prototype. First, we would like to add flexibility to our 'blacklist' feature to allow users to add or remove apps that the user chooses. Perhaps, rather than labeling it simply as "Blacklisted Apps," we could explore alternative terminology to ensure clarity of the meaning of the feature. Second, incorporating a calendar view within our daily tasks interface could enhance user engagement. By providing a visual representation of the current day within the month or week, users can effortlessly stay informed about their schedule, promoting greater awareness and organization. Lastly, to streamline task management, the addition of sub-tasks within existing tasks is crucial, especially for big projects that require multiple tasks. The addition of sub-tasks would empower users to break down complex tasks into manageable components,

facilitating progress tracking while maintaining focus on the overall objective.

9 Peer Ratings

We agree as a group that everyone equally contributed towards all aspects of this HCI project. In addition to what's listed below, everyone attended periodic meetings where we planned, brainstormed, and delegated the following tasks:

Hayden Balsys, 16.7%, did a majority of both the low and high-fidelity prototype design.

Kyle Pickle, 16.7%, did much of the background and research and edited/formatted the demo video and reports.

Alfredo Nieto, 16.7%, helped with interviews, and assembled the personas we used to identify the target audience of our application.

Shazeb Shafi, 16.7%, worked on sections like our introduction and timeline and helped convert a lot of our ideas into writing.

Manreet Sohi, 16.7%, worked with Hayden to complete and report on the low and high-fidelity prototypes.

Daniella Strong, 16.7%, conducted much of the interviews during the needfinding process and worked with Alfredo to formulate our personas.

10 REFERENCES

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