



DEPARTMENT OF COMPUTER SCIENCE

Phone Jail: Controlling Phone Addiction Through a Tangible Actuated Phone Jail

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Abstract

Daily mobile phone usage puts people at risk for addiction and can hinder both productivity and mental health. Software solutions that limit screen time exist, but their effectiveness can vary. In this paper, we take a different approach by looking at a tangible and physical jail for phones. The tangibility aspect of our solution provides a powerful and immediate sense of control, making it more effective in reducing phone usage. Our "Phone jail" product not only includes a set timer for your phone to be locked but also offers a range of features to prevent distractions and encourage healthier behavior. The product aims to encourage individuals to take time off their phone to focus on their important tasks such as studying and work. It offers a fun and effective way to limit screen time by allowing users to "jail" their phone for a set period. The time period can be determined by the user through the product's interface, allowing for customizable durations based on their individual needs. The significance of the time period lies in the ability for the user to take a break from phone usage, promoting healthier habits and reducing digital distractions. By setting a predetermined time limit, the user can focus on other activities without the temptation to constantly check their phone, ultimately leading to increased productivity and improved mental well-being. The product features a locking mechanism that securely holds the phone, preventing access for the chosen time frame, which enhances focus as the phone isn't in use. The jail also includes both positive and negative reinforcements to encourage healthy habits, such as a reward dispenser that outputs candy when a user completes the set time. Another positive reinforcing feature of the phone jail is its streak counter, which keeps track of how many times a user successfully completes their designated jail time. Both a water spray that activates when the individual attempts to remove their phone before the designated time release and additional time being added are negative reinforcements in the product. This gamification aspect adds a fun and competitive element to phone management. To assess the effectiveness of our device, we conducted Study 1, a questionnaire that got 32 responses from participants. In Study 2, we observed two groups of participants during their normal study time with and without the phone jail, aiming to eliminate biases and better understand the impact of our product on phone usage habits. Through our research, we found that the tangible and actuated nature of the phone jail and its combination of positive and negative reinforcements contribute to its effectiveness in promoting healthier phone habits. The phone jail is a practical product tool for anyone seeking to limit their phone usage and focus on real-life interactions, studying, and working. It offers a unique blend of technology and behaviour change techniques (BCTs) to encourage healthy habits by reducing screen time.

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Chapter 1

Introduction

Obsession with mobile devices is an escalating concern in our modern digital world, as more and more individuals are constantly getting attached to their screens, craving immediate satisfaction and a quick injection of dopamine.

User study reveals survey revealed that in 2021, 97% of U.S. citizens possessed a mobile phone, while 85% had a smartphone, signifying a vast population vulnerable to addiction [4]. The uncontrolled usage of smartphones is associated with multiple negative impacts on mental well-being, interpersonal connections, and efficiency. Consequently, discovering methods to tackle this dependency is critical. A potential remedy is the inventive product "phone jail," which prompts users to secure their phones, fostering a more balanced connection with technology.

Phone addiction can have a wide range of negative outcomes. Excessive phone use has been linked to mental health issues such as anxiety, depression, and sleep disturbances, according to research [8]. Furthermore, constant phone use interferes with people's ability to have meaningful face-to-face conversations, resulting in weaker interpersonal connections [20]. Phone addiction has been found to reduce productivity and job satisfaction in the workplace, as employees frequently struggle to focus on tasks due to constant interruptions from their devices [7].

phone jail operates on the premise that physical separation from the phone can lead to positive behavioural changes. A study [11] discovered that individuals who spent less time on their phones experienced improved sleep quality. These studies suggest that limiting access to smartphones, as "phone jail" does, can yield tangible benefits for users.

phone jail is a small box that securely locks your phone and prevents you from using it for a set period of time. Once your phone is inside the box, you can set a timer for how long it will be locked away. You are free to focus on your work, study, or any other activity during this time without being tempted to check your phone. The idea of using a lockbox to manage phone usage is not new, but it elevates it with its unique features. To encourage users to stay focused and avoid distractions, the product employs a combination of positive and negative reinforcements.

By offering a way to manage phone usage, "phone jail" empowers individuals to take control of their lives and develop a healthier relationship with technology. As phone addiction continues to be a growing concern, products like "phone jail" are essential in

promoting more balanced and mindful use of technology, ultimately improving mental health, interpersonal relationships, and productivity.

Chapter 2

Related Work / Originality

While there are many advantages to using mobile phones such as utilizing them as a social outlet, accessing academic resources, and playing games (leisure)[15], phone addiction can lead to negative impacts on an individual's daily life. It can especially have a bad effect on people's sleeping patterns.[18] People tend to spend several hours before they go to bed. Many people also complain about using smartphones at the dining or any other family activities. They barely have a chance to have a conversation together as they are all busy scrolling down smartphone screens[5]. Additionally, mobile phones now become ingrained in the behaviour of young people, and it is the fact that mobile phones are significantly interrupting their daily activities such as school and outdoor activities[2].

2.1 Similar Existing Products

A similar product we have found is the kSafe(aka Kitchen Safe) which is made by Kitchen Safe company.[13] This product has different dimensions: mini (phone-sized), medium (for snacks and video game controllers), XL for larger electronic devices such as an iPad/tablet. It was innovative to consider the sizes of different distractions. Though, PhoneJail was implemented to be used on phones only as it was intended to be used by students and professionals with phone addiction. On the other hand, the fact that kSafe had instructions to break the box in case of an emergency[13]; would make it costly for a replacement. Also, according to Bhattacharya's study if users do not identify with the company strongly then they would likely switch to competitors [3], so this would be a major drawback if it occurred.

The iDiskk Cell Phone Lock Box is a miniature version that takes one phone at a time though that makes it portable and more individual. One commendable feature is that it has a charging hole for USB chargers to charge smartphones while out of use and another one is the use of receiving a call while in the box through the holes in the lid.[1] Its design was complimented due to it using one phone at a time, therefore could be used for one person and is significantly more portable than other similar products. However, the holes seem big and could be used for scrolling on social media sites so that might be a possible downfall of this product.

Finally, the MINDSIGHT Lockbox[14] is a box that can hold multiple phones at a time that is also non-transparent unlike the previous two products which are transparent. This is significant as in Ward and Duke's study it was found that the presence of one's phone in

their visual space causes decreased cognitive performance.[22] Consequently, this should help with focus of users. Moreover, it has three commitment modes which makes it more personal to users and should give them a higher sense of control and should make the product more preferable for them.[12]

2.2 Technology assisted self-control

Positive reinforcement and punishment strategies A study by Greer and colleagues found that participants who received positive reinforcement for completing tasks had significantly higher task completion rates compared to those who did not receive reinforcement.[9] Another related study by Mirenowicz and Schultz found that immediate positive reinforcement was more effective than delayed reinforcement in establishing and maintaining the association between behaviour and reward.[19] These findings suggest that delivering positive reinforcement quickly and consistently can increase the likelihood of desired behaviour.

The study by Riordan et al explored the effectiveness of a gamified app in enhancing self-control.[17] The app incorporated both rewards and punishments, with the punishment being the loss of points for failing to achieve the set goal. The results indicated that the use of punishment in the app was effective in helping users stick to their goals and resist temptation. The participants who received punishment for failing to achieve their goal showed a significant increase in goal adherence compared to those who only received rewards. The researchers suggested that punishment may be more effective in enhancing self-control due to the principle of loss aversion, which posits that people are more motivated to avoid losses than to acquire gains.

2.3 Human Computer Interaction

In the context of self-regulation, one of the HCI goals is to incorporate methods for progress tracking and setting goals. Pandero and Alonso's study correlates with this approach, as it suggests the effectiveness of progress tracking in promoting self-regulation.[16] One of the progress tracking methods is the use of digital streaks displayed on an LCD screen. A minimalistic approach has been taken for goal-setting by incorporating an acrylic glass on the side of the device, which can be used with a whiteboard marker to hold the user's current goal and serve as a physical reminder. The effectiveness of digital streaks as a progress tracker has also been supported by Conroy's study, which revealed that streaks are more effective for individuals who are just starting out in the activity, such as exercise.[6]

2.4 Summary/Originality

The related work section presents similar products in the market that are designed to promote self-control and reduce distractions. The kSafe, iDiskk Cell Phone Lock Box, and MINDSIGHT Lockbox are among the products discussed. The section also discusses the use of technology in promoting self-control, specifically the effectiveness of positive reinforcement and punishment strategies. The study by Riordan et al. revealed that incorporating punishment in a gamified app can help users stick to their goals and resist

temptation. Moreover, the study by Kullgren showed that the use of a digital streaks feature on a smartphone app can increase physical activity and promote healthy behaviour change. Finally, the HCI goal of incorporating methods for progress tracking and goal-setting is discussed, with Pandero and Alonso's study suggesting the effectiveness of progress tracking in promoting self-regulation. Overall, the related work section highlights the importance of self-control and the various tools and strategies that can be used to promote it and the originality of our product as it is one of the few with such reinforcements techniques.

Chapter 3

Study 1: Questionnaire Findings and Analysis

In order to collect feedback on our preliminary design and execution concepts for our phone jail, we performed a user study in the form of a questionnaire. This questionnaire was also used to find and refine our various ideas of implementing positive and negative reinforcement for our product.

Questions included in the questionnaire were a mix of open-ended questions, multiple choice questions and scales to get mostly qualitative feedback on our ideas.

3.1 Demographics

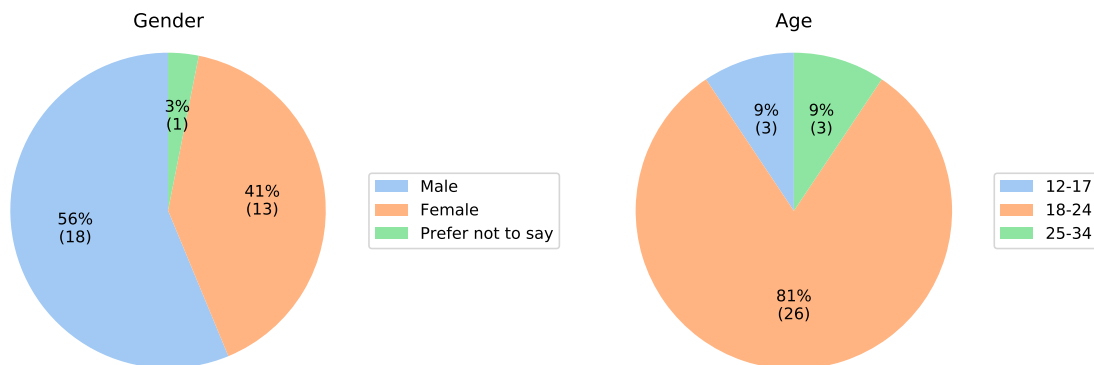


Figure 3.1: Gender and Age responses

We had gotten 32 responses in total, in which 18 respondents identified as Male, 13 of identified as Female and 1 did opted not to state their gender. Out of this, the majority of respondents were aged between 18 and 24, with 81.3% of the replies being from this age group.

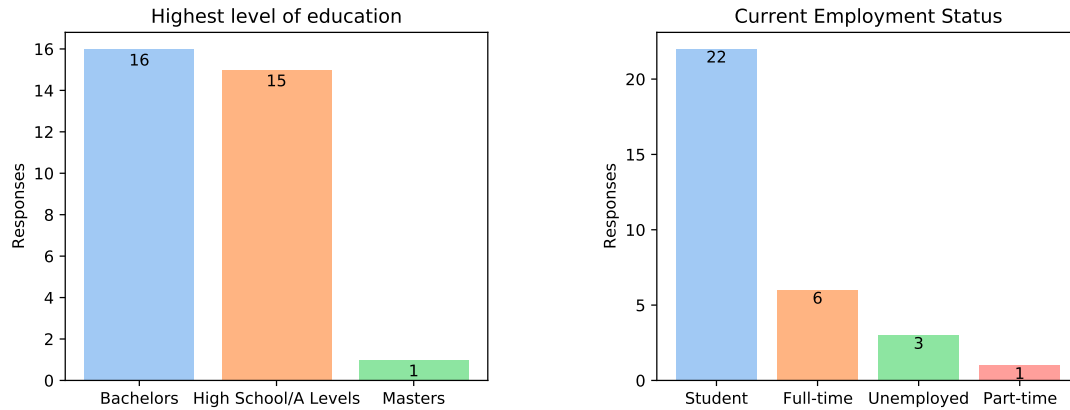


Figure 3.2: Education and Employment responses

The survey was distributed primarily among friends, which may have contributed to a higher number of student responses. Looking at the qualifications of the respondents we see that those with a bachelor's degree and those with A-levels were almost equal at 16 and 15 responses each respectively.

3.2 Phone Usage

We asked survey participants about their mobile phone usage to gain insight into their device usage patterns. From these questions, we have found the following.

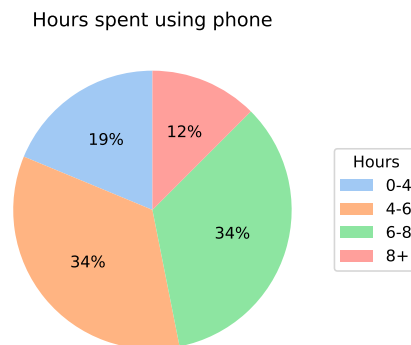


Figure 3.3: Hours

We see that the responses, 46% of the total respondents spend over 6 hours or more on their phone, which can lead to "a higher risk for depression" [10]

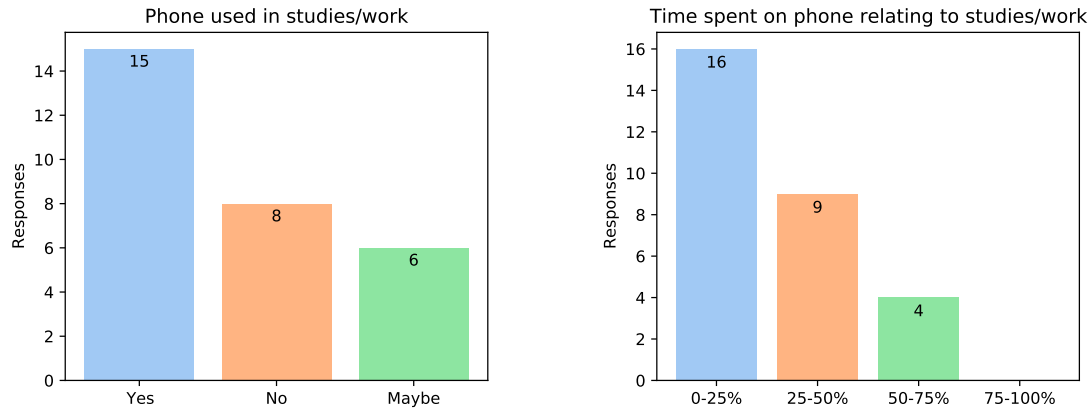


Figure 3.4: Phone Usage for Studies and Work responses

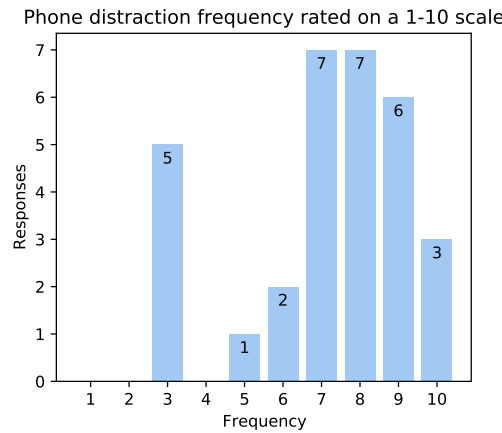


Figure 3.5: Phone distraction frequency

We can see from Figure 3.4 that there is a need for mobile phones in studying/working but we can also see that even though that is the case, most of the time spent on their devices account for non-productive work. More than half of the respondents report that time spent on their phone which is work-related accounts for just only 0-25% of the total time they spend on their phones.

From 3.5, we can also see that the previous statement is supported as almost 84% of the respondents believe that their phone is major distraction in their work/studies.

3.3 Key Findings

The main objective of this questionnaire was to get relevant feedback on our ideas of positive and negative reinforcement along with our design ideas. The findings are as follows.

3.3.1 Positive and Negative Reinforcement

The questionnaire asked users for their feedback on our proposed ideas for positive and negative reinforcement, specifically whether they approved of the ideas, disapproved of them, or had a neutral opinion. The results are as follows.

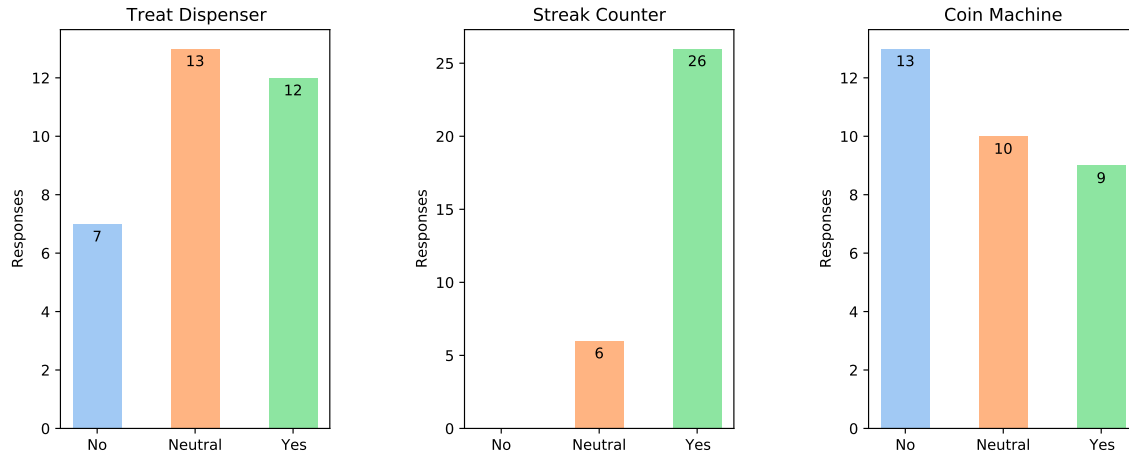


Figure 3.6: Positive Reinforcement responses

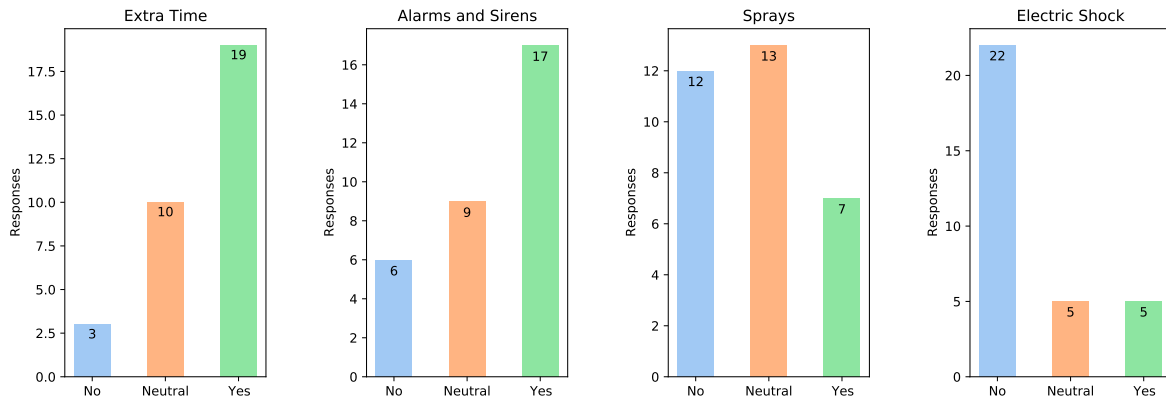


Figure 3.7: Negative Reinforcement responses

3.3.2 Design

The questionnaire also linked to an image [4.7] and asked users for their feedback on the product visually, as well as feedback on how it could be improved.

From the responses, we could see that over 56% of the respondents disliked or were neutral on the design aesthetic. Furthermore, we had gotten strong feedback to improve the design by implementing more modern and symmetric design choices.

3.4 Limitations

The finding from this questionnaire were deduced from on only 32 responses, and it is likely that getting more responses would have changed the trends that we have seen currently. Furthermore, since most of the respondents were students or the younger age group, we might be missing more critical evaluation or feedback which could be provided by a more senior audience.

3.5 Improvements Based on Survey Feedback

As a result of the questionnaire the following changes were implemented

1. Completely redesign to jail to be more functional, symmetric and visually pleasing.
2. Remove features such as electric shocks and sprays which users were fondly against.
3. Introduce alarms or sirens as a negative reinforcement.

Chapter 4

Design and Implementation

This section explores further into the design and implementation of our phone jail, a system intended to help users better control their phone use. Our objective is to develop a solution that addresses the needs of people who struggle with phone addiction or excessive screen time while integrating usability, aesthetics, and practicality. We'll talk about the system's various components, the technology that makes it run, and the design of the user interaction that influences the overall user experience. Addressing these issue involves exploring various strategies and interventions to promote healthy, productive usage and foster digital well-being.

4.1 System Overview

The phone jail system consists of four main components: the phone containment unit, the timer display system, the reward dispenser, and the door mechanism. These components are integrated within a compact and user-friendly design, ensuring a seamless user experience.



Figure 4.1: Final Tangible Actuated Phone jail Product

4.1.1 Containment unit

The phone containment unit, which serves as the primary component, is specifically designed to hold phones of various sizes securely. The containment unit is constructed from durable material to ensure its protection of the phones and to be able to withstand frequent usage as the device prioritises functionality and durability.

All sides of the containment unit feature transparent glass with the front being the door that provides visibility of the phone's screen, allowing users to monitor notifications and other relevant information without physically accessing the device allowing for no distractions. The door is down by default and is designed to move up and down, controlled by an actuator tied to the door mechanism.

4.1.2 Door mechanism

For the door, an actuator mechanism is in charge of controlling how the door moves up and down. When the user specifies the lock time, the door will move up and then back down to confirm that the time has been set. If the user approaches the device before that designated time ends, it is programmed to automatically move the door up through a distance detector, which continually monitors the user's proximity to the product.

The actuator starts by gradually shutting the door from the bottom up once the user is detected within a predefined distance. To prevent additional access, a buzzer sound is activated if the user goes closer. The actuator is designed to work smoothly and quietly, offering the least amount of interruption to the user's environment.

4.1.3 User interaction design

Our phone jail system uses a straightforward interface that enables users to control additional settings and choose the duration for the lock time in order to encourage user engagement. Even for consumers with no prior technical knowledge, the system is designed to be accessible and simple to use.

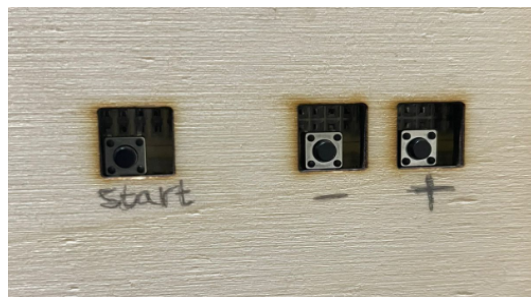


Figure 4.2: User interactivity time configuration

Users may enter the desired lock time using a simple three button layout interface after their phone has been placed in the containment unit. In order to validate the chosen time and start the locking process, the phone jail gives visual feedback through an LCD screen. The visible countdown displayed on the LCD screen allows users to keep track of the remaining time during the lock period.

4.1.4 Reward dispenser

The reward dispenser is an added feature designed to encourage users to adhere to their self imposed phone usage limits. The dispenser delivers a tiny reward, such a snack or candy when a lock time has been successfully completed in order to reinforce positive behaviour. Users may personalise the rewards by refilling and customising the dispenser to their desires.

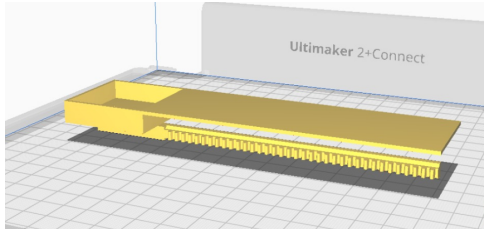


Figure 4.3: 3D model of the tray and linear pusher for the reward dispenser

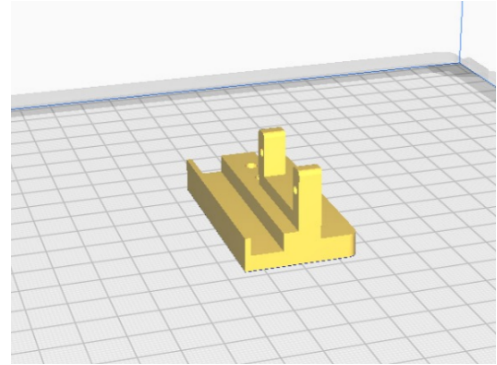


Figure 4.4: 3D bracket model for the reward dispenser

We came up with the design and idea of using a 3D model that is put on the side. When the user finishes their dedicated time period, the servo will push the gears to push the rewards out the phone jail for the user to grab. The reason we went for this design was because we wanted to turn a normal servo into a linear servo actuator which was needed to complete the dispensing action. In addition, the 3D tray is used to store the "reward" or what the user customises in the future.

4.2 Initial Design

Firstly, we took a look at the overall design, which prompted many questions on how it should look, what colour it should be? And what size as well. We initially had a design that resembled a library and had indications of enhancing productivity when storing the phone due to it's aesthetics.

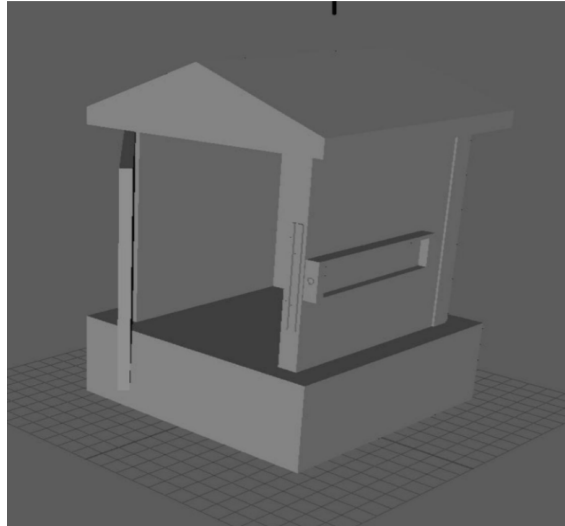


Figure 4.5: Initial 3D design: Where it all started

After getting some feedback and responses from our first questionnaire study, we realised people were not so fond of the design. It basically had a house like structure with the components being stored on both the top and bottom parts of the product. Although the design allowed us to be able to store many components, people were not in favour of it.

Furthermore, An Ideal jail should be both visually appealing and functionally efficient to encourage users to willingly store their devices during the designated periods. It should be easy to use, durable, and provide productivity and good use of the user's time. Incorporating features that allow customisation, such as setting time limits for the phone to be locked for and many others such as reward dispensing to promote healthy phone usage. Ultimately, a thoughtfully designed phone jail can serve as an essential aid in helping users regain control over their digital lives and prioritise productivity to allow them to get their work and studies done.

4.3 Prototyping the Design

Prototyping of the product had to be done to both know the size that should be implemented and how visually appealing it would look. The chosen material was cardboard as it was the easiest to mould into the shapes we desired.



Figure 4.6: Creation of the first prototype with cardboard

After having a look at our 3D model physically, we started noticing some flaws in the design. It was too narrow and the phone had to be standing up when placed inside. this was not a an issue but visually/practically did not fit our criteria. It also did not have much space at the bottom for components such as the arduino to be stored. Although we noticed these flaws, more importantly, users were particularly unhappy with the design of the top part of the phone, as indicated by the first questionnaire.

Another prototype with a different design was required to resolve the issues that were raised by the first questionnaire and others that were noticeable physically.

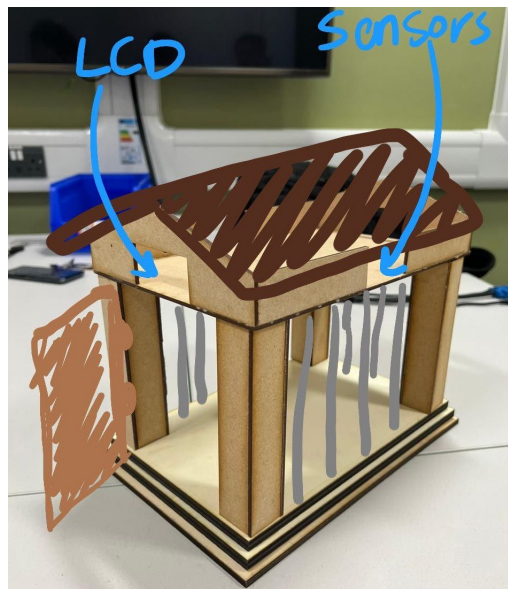


Figure 4.7: Showing how the LCD & sensors were integrated into the roof

This had many improvements from the first prototype. It firstly had better usage of space within the containment unit. Also, an area for the LCD placement and components. Although this was improvement, the user's feedback through the first questionnaire indicated that they still did not like the roof which had a house like design.

4.4 Mechanisms

In this section, we outline the mechanism of our phone jail product and describe the process a user would follow to utilise the device effectively. The product employs two interconnected Arduino microcontrollers that communicate through high and low signals, ensuring seamless operation. When a user decides to lock their phone away for a predetermined duration, they interact with the control buttons connected to the first Arduino microcontroller. The control buttons enable the user to set the desired lock duration by increasing or decreasing the time and confirming their selection. As they interact with the buttons, the LCD display, also connected to the first Arduino, provides real-time feedback on the selected lock duration and shows relevant information such as the time remaining for the phone to be unlocked.

Once the user has set the desired lock duration and placed their phone inside the jail, the first Arduino sends a high signal to the second Arduino microcontroller. The second Arduino then activates the supersonic distance detector, which senses if the user approaches the phone jail within a specific range, initiating the closing of the door using a stepper motor. If the user moves even closer, the buzzer connected to the second Arduino emits a loud noise, deterring the user from attempting to retrieve their phone prematurely.

When the predetermined lock duration has been successfully completed, the first Arduino sends a low signal to the second Arduino, indicating that the time is complete. The second Arduino then deactivates the supersonic distance detector and unlocks the door. Simultaneously, the reward dispenser connected to the first Arduino releases a small reward such as candy as, positive reinforcement for adhering to the time limit. The phone jail's door opens, allowing the user to access their phone.

Chapter 5

User Interviews

We also conducted user interviews to see how people would use this, as well as how effective it would be for its purpose. We also used this opportunity to get general feedback on the product and figure out ways of improvements for the future.

5.1 Interview Methodology

We had 2 groups, each with 2 participants. We conducted the interviews and studies in a way that we observe their behaviour over two days and compared the results.

We observed the participants during their normal study time and how much they used their mobile phones, with and without our phone jail. We had Group A first start with not using the phone jail and using the phone jail in the next study, whilst Group B studied with the phone jail initially and did not use it in the subsequent study.

We had done this so as to remove any biases from the study. It might of have been the case that if one group started with the phone jail, they might have been more aware of their phone usage in the subsequent study or vice-versa.

5.2 Key Findings

5.2.1 Behaviour results

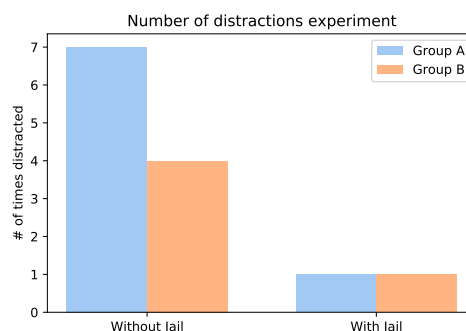


Figure 5.1: Phone Jail Study results

Group A, the group which did the study initially without the phone jail on average had around 7 distractions during the 2 hours recorded. We see that the number for Group B without the jail is significantly lower, at around 4 distractions over the 2 hours. This might be as a result of being more aware of the study being done and in general being more reluctant to use their phone during this time period.

We can see that distractions with the phone jail were pretty low at around 1 on average for both of the groups. As this is a good indicator of the effectiveness of the jail, we also do have to consider that the participants were more hesitant to take their phones as a result of being observed, or that the jail itself was not so straightforward to use for them.

5.2.2 Focus results

Participants were asked to score how focused they believe they were after each study, and the following was found

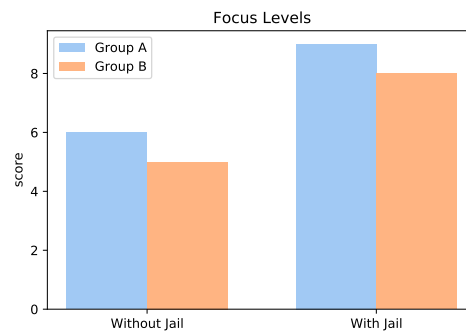


Figure 5.2: Phone Jail Study Focus results

Overall, both of the groups on average believe that the phone jail made them more productive and more focused on studying during the course of the experiment.

5.2.3 General Feedback

Alongside this data, we used this opportunity to ask their general opinion on the product itself. All the participants brought up the issue practicality of such a huge device. There were concerns of how market-ready the device would be as well.

5.3 Auto-ethnographic experience

We conducted an experiment along with PhoneJail for 3 hours in MVB while we studied. All the team members were required to put their phones inside of PhoneJail during the experiment. The aim of the experiment is to ascertain how PhoneJail affects our daily life as well as illustrating the advantage of using PhoneJail. We observed that some of us were anxious about not being able to use their smartphone after 2 hours. This was likely due to their habitual routine of checking their phones every two hours for various purposes such as social media browsing, watching videos on YouTube, or messaging friends. However, since our phones were kept in PhoneJail, they were forced to focus on their study. Eventually,

they went back to study until PhoneJail released our phones alongside a sweet treat. During the experiment, we highly believe that PhoneJail has a high positive impact on our studying performance. Most importantly, most of us felt rewarded due to the fact that not only PhoneJail informed us of the completion time we had set up but also provided such sweet treats. Therefore, we strongly believe that PhoneJail may change our behaviour.

Chapter 6

Conclusion

To conclude, the Phone Jail is a practical and effective tool for managing regular mobile phone usage and promoting healthier habits. The study's results from the questionnaire revealed that people often give in to phone addiction and can experience hindrances in productivity and mental health due to excessive regular phone usage. Phone Jail's design aims to prevent distractions and encourage individuals to take time off their phones to focus on tasks that are considered to be productive such as studying, working or reading. The results from the user study show that it can limit screen time and increase productivity by allowing users to "jail" their phone for a set time period, which can be customized based on individual needs. The product's locking mechanism securely holds the phone, preventing access for the chosen time frame, and includes both positive feedback and punishment to encourage healthy habits through different strategies to reach a wider audience. The gamification aspect adds a fun and competitive element to phone management. Overall, the "Phone jail" product offers a unique blend of technology and behaviour change techniques to reduce screen time and promote healthier habits.

6.1 Future Work

6.1.1 Wireless charger

While users interact with PhoneJail, their phones might be running out of battery. Therefore, we came up with an idea which is a wireless charger in Phone Jail that allows users to charge their phones while they are in the device. More specifically, the wireless charger will automatically begin charging the phone. This feature ensures that users do not have to worry about their phone running out of battery while they are using Phone Jail.

6.1.2 Emergency Stop!

It is important to consider safety measures in case of emergency situations. Therefore, we agree that it would be a good idea to implement a manual stop functionality in Phone Jail. This allows users to immediately stop the device in case of any emergency. This feature could be activated through a physical button or a touch screen interface, making it easily accessible and user-friendly. Since this functionality is crucial, it is highly recommended that especially new users of the device receive proper instructions in advance.

6.1.3 Bluetooth / Wi-fi connection

While there are many phone lockers available in the current market, none of them analyze how much users attempt to interact with their phones by showing graphs or charts then sending all the information to users' device such as phones or table. It would be determining that if PhoneJail supports this functionality due to the fact that graphs and charts have the ability to formulate information into easily comprehensible formats[21]. Therefore, If users analyse their own usage of PhoneJail, it would aid them understand their progress towards their goals. This could be achieved by providing users with access to usage data such as how long they have been using PhoneJail, how often they use it, and how much time they spend on their phone during each session. By using this data, users can determine whether they are making progress towards their goals and adjust their usage of PhoneJail as necessary.

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Appendix A

Appendix

In our group of seven members, we acknowledged the significance of incorporating diversity and cultivating a welcoming atmosphere. We integrated a variety of inclusive methods to make certain that each participant felt appreciated and listened to, no matter their origins, past encounters, or viewpoints.

Initially, we carried out a team-building activity at the start of the project, where every individual shared their cultural background, work experience, and personal hobbies. This exercise allowed us to better comprehend and value the distinct qualities and capabilities that each person contributed to the team. It also enabled open dialogue and nurtured a sense of unity among team members. We set up basic guidelines for group gatherings, making sure that all participants had the chance to express themselves and put forward their ideas.

We embraced an organized method for group conversations, giving each person the opportunity to express their thoughts, while others were motivated to listen actively and raise questions. This method made certain that everyone's opinions were acknowledged and respected, cultivating a sense of belonging and shared respect among team members. To further boost our inclusivity attempts, we employed a rotating leadership system, where each person had the chance to guide a specific task or phase of the project. The team was divided into pairs, with each pair focusing on a particular hardware component and a section in the report. This method enabled us to make use of the diverse abilities and leadership approaches of our team members, while also offering every individual a chance to build their leadership and project management skills.

Lastly, we actively gathered feedback from each participant regarding their experience within the team and any proposals they had for enhancing our diversity and inclusion strategies. We organized routine check-in gatherings to tackle any concerns or problems and made modifications to our team dynamics as necessary to guarantee a positive and inclusive environment for everyone. By employing these inclusive practices, we managed to establish a united and cooperative team that took advantage of our varied backgrounds and viewpoints, ultimately improving the quality and success of our project.

Experiment Details

Overview: The main purpose of the experiment is to evaluate PrisonJail model. We collected a group of students to engage in the product. We ask all students to participate in the experiment with their smartphone. We aimed to observe how they engaged with PrisonJail while being separated from their smartphones. At the end of the experiment, it allows us to gain a better understanding of the product's performance and user engagement.

Participation: It is completely up to your decision whether you participate in the experiment or not. Before we conduct the experiment, we make sure that you fully understand the progress of the experiment. However, you are free to withdraw at any time.

Confidentiality: We will collect your age and gender as part of the experiment. Your identities will be kept as anonymous throughout the process. Also, all the data we collected will not be stored in public.

Risks and Benefits: You will be asked to keep your smartphone in the product for certain time period. During this time, we will ask you to set up your smartphone as muted as possible since other participants will be distracted by the sound. However, when it comes to an emergency, we will manually stop the product and you can retrieve your phone from the product. We hope that your experience and the experiment will help us to evaluate our product to improve the usability and effectiveness of our product.

Thank you for your participation

Figure A.1: Consent form for the experiment

PARTICIPANT CONSENT FORM

Please answer the following questions to the best of your knowledge

	YES	NO
HAVE YOU:		
• been given information explaining about the study?	<input type="checkbox"/>	<input type="checkbox"/>
• had an opportunity to ask questions and discuss this study?	<input type="checkbox"/>	<input type="checkbox"/>
• received satisfactory answers to all questions you asked?	<input type="checkbox"/>	<input type="checkbox"/>
• received enough information about the study for you to make a decision about your participation?	<input type="checkbox"/>	<input type="checkbox"/>
• ascertained that you don't have any known condition that prevents you from taking part in this study?	<input type="checkbox"/>	<input type="checkbox"/>
DO YOU UNDERSTAND:		
that you are free to withdraw from the study and free to withdraw your data prior to final consent		
• at any time?	<input type="checkbox"/>	<input type="checkbox"/>
• without having to give a reason for withdrawing?	<input type="checkbox"/>	<input type="checkbox"/>

I hereby fully and freely consent to my participation in this study

I understand the nature and purpose of the procedures involved in this study. These have been communicated to me on the information sheet accompanying this form.

I understand and acknowledge that the investigation is designed to promote scientific knowledge and that the University of Bristol will use the data I provide for no purpose other than teaching and research.

I understand the data I provide will be **anonymous**. No link will be made between my name or other identifying information and my study data.

I understand that the University of Bristol may use the data collected for this study in a future research project but that the conditions on this form under which I have provided the data will still apply.

I agree to the University of Bristol keeping and processing the data I have provided during the course of this study. I understand that this data will be used only for the purpose(s) set out in the information sheet, and my consent is conditional upon the University complying with its duties and obligations under GDPR.

Participant's signature: _____ Date: _____

Name in BLOCK Letters: _____

Figure A.2: Consent form for the experiment

Student experiment permission form for COMSM0058 and COMS30055

Unit director name: Anne Roudaut

Student name(s): Junyoung Kim, Bader Almutairi, Nafaal Ibrahim, Yiqiao Liu, Cheng Wang, Jinjie Bai, Abdulrahman Abdulaal.

Student ID(s): sf20697, cf20700, qx20895, ww19134, pq19115, py19136, mb20732.

Project title: Phone Jail

Summary of proposed experiment(s): The main purpose of the experiment is to evaluate Phone Jail model. We collected a group of students to engage in the product. We ask all students to participate in the experiment with their smartphone. We aimed to observe how they engaged with the device while being separated from their smartphones. At the end of the experiment, it allows us to gain a better understanding of the product's performance and user engagement.

In order for the project to fall within the scope of ethics application 13796, all answers to the following questions must be "No". More details are available in the project handbook, available on the unit Blackboard page.

Does the proposed experiment gather data from animals? No

Does the proposed experiment gather data from vulnerable populations? No

Does the proposed experiment gather sensitive information? No

Does the proposed experiment take photos or videos of people? No

Does the proposed experiment gather other data which, if lost, would allow participants to be identified? No

Does the proposed experiment gather data from people who have not given full informed consent? No

Does the proposed experiment trick or deceive participants in any way? No

Does the proposed experiment involve danger of physical or mental harm? No

I certify that the above information is accurate, and that I have read the ethics section of Blackboard.

Date: 29/04/2023

Student signature(s):

Figure A.3: permission form for the experiment

**Junyoung Kim, Bader Almutairi, Nafaal Ibrahim, Yiqiao Liu, Cheng Wang,
Jinjie Bai, Abdulrahman Abdulaal.**

I certify that I have discussed the methodology of the proposed experiment with the student(s) in detail, and that I am satisfied that the above information is accurate.

Date: 29/04/2023

Unit Director:



Guidance for students

Please email this form to anne.roudaut@bristol.ac.uk and peter.bennett@bristol.ac.uk by 17th February alongside the reporting form. Please ensure that you discuss the plans of the study in detail to ensure it falls within the blanket ethics application.

Note that this form does not need to cover every experiment in the project – if you later decide to run more experiments, then it is perfectly fine to submit multiple copies of the form.

Once you have the green light, please use the files in the template folder (information for participants and consent form)

Summary of proposed experiment(s): It is very important that you discuss your plans in detail with your supervisor *in advance of running the study*, but you do not need to write the plan in full on this form. A single sentence should be enough.

If you have any other questions, please contact Anne Roudaut (anne.roudaut@bristol.ac.uk) or Pete Bennett (peter.bennett@bristol.ac.uk).

Figure A.4: permission form for the experiment

This video provides instructions on how to use PhoneJail.

PhoneJail video URL : <https://youtu.be/GzsTwo12Rb4>