

Just:
Redefining Digital Routines
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As part of our bachelor thesis, we would like to take this opportunity to thank various people who supported us throughout the project.

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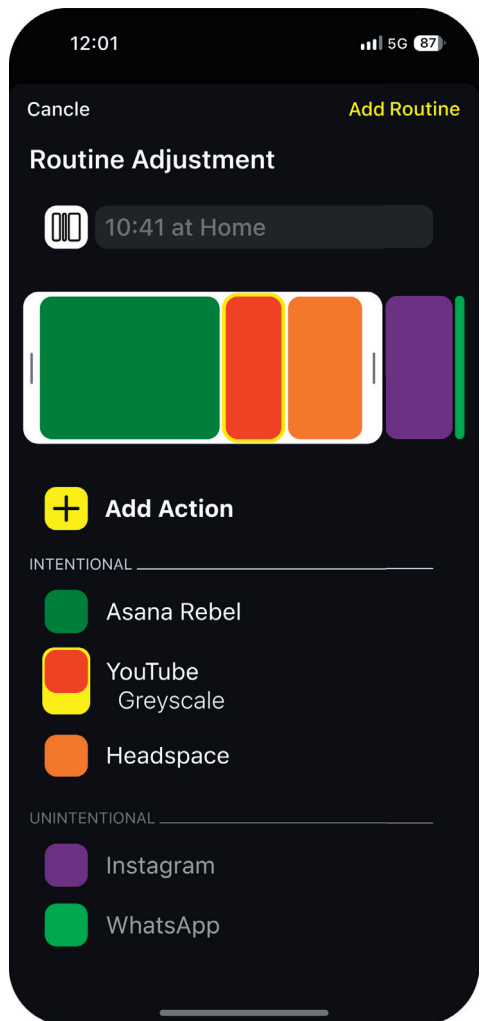
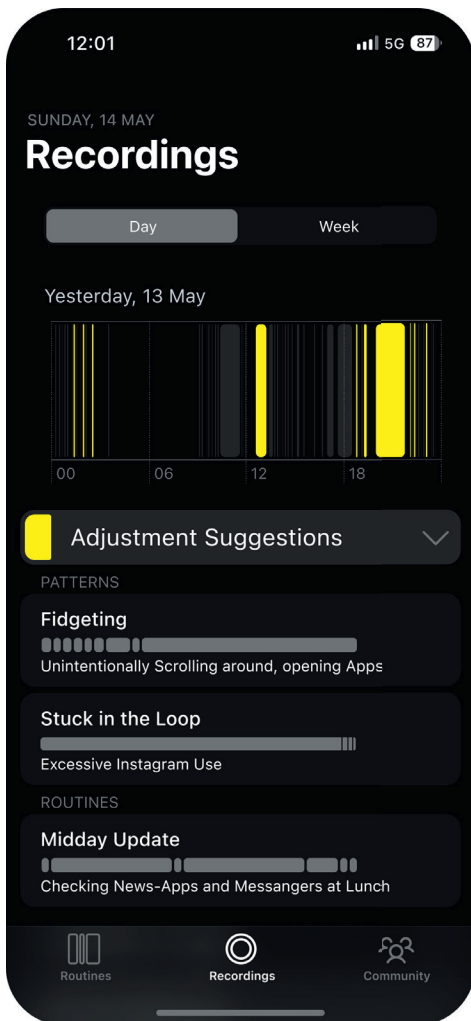
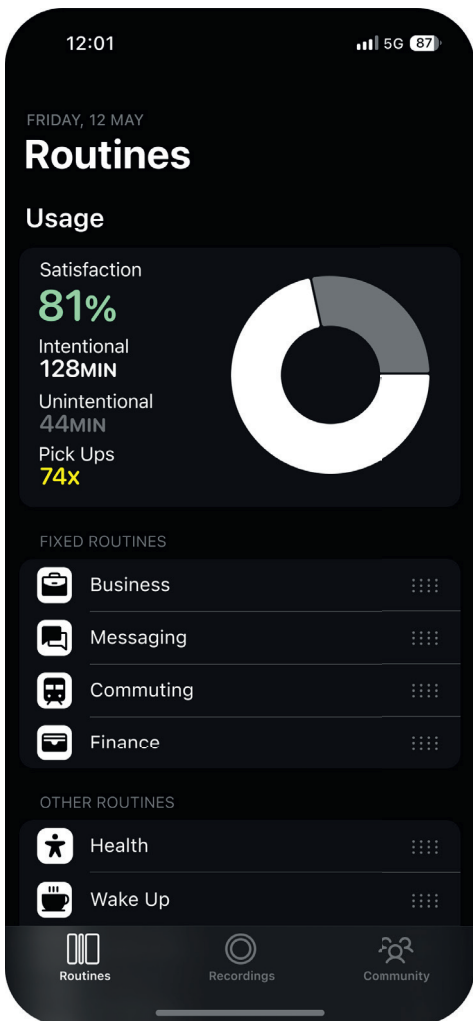
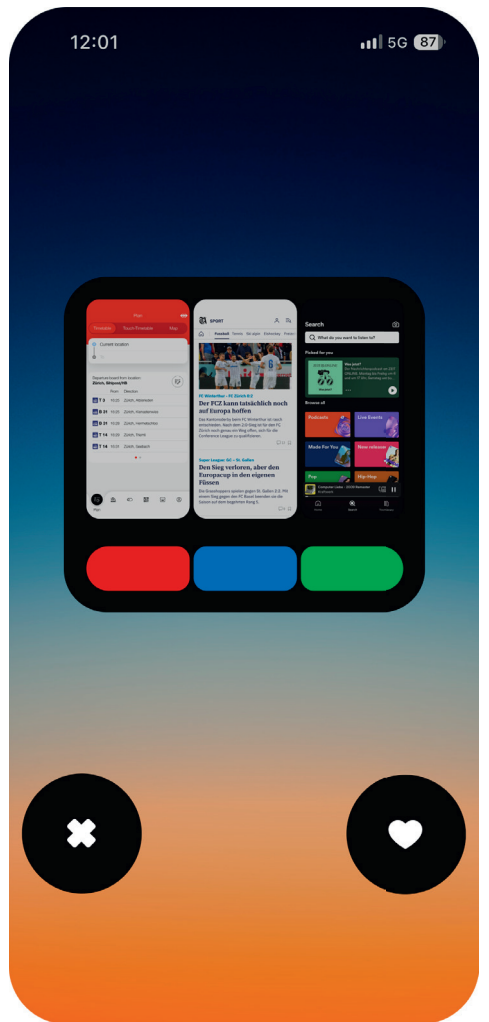
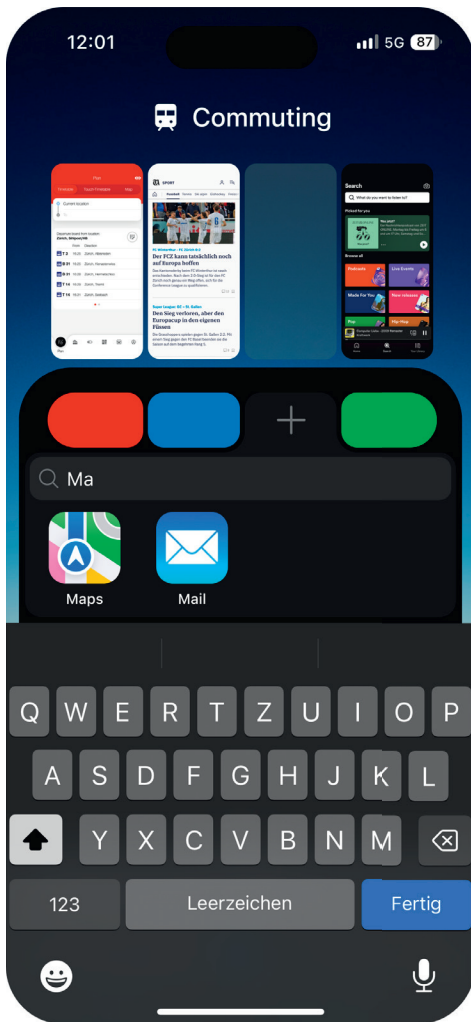
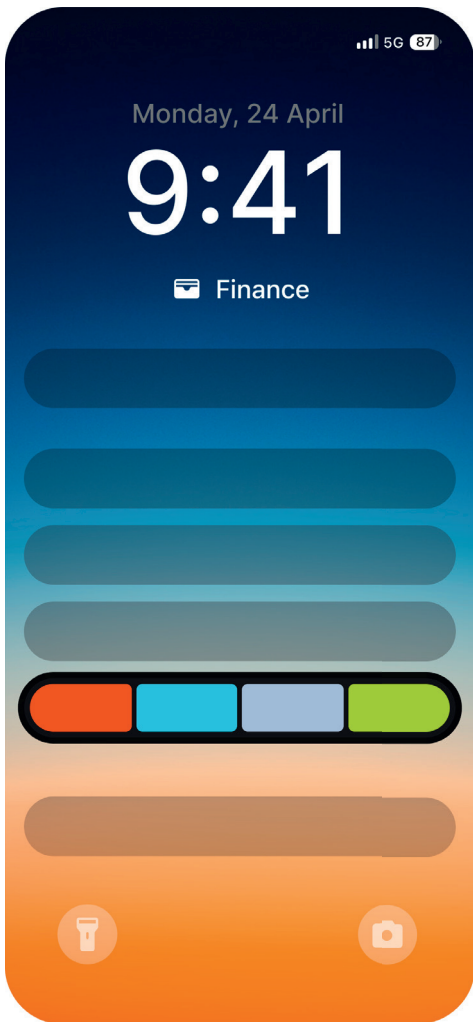
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ABSTRACT

This bachelor thesis explores the phenomenon of compulsive smartphone behavior. It focuses on the habits and routines related to smartphone use and their impact on user satisfaction. In doing so, the status quo of mobile user interfaces, the basic structure of the operating system, and the design all around are considered unsatisfactory.

Operating systems used by billions of users every day seem to distract more and more people from their real intentions and leave them frustrated later on, as time spent on the smartphone is often perceived as wasted. Although deliberate design can influence habit formation, current mobile operating systems do not offer users the opportunity to influence their habits by themselves. Instead, they allow the attention economy to pursue their interests. We believe that users should be able to decide for themselves which actions should be internalized and which should continue to be executed as conscious decisions.

The approach of the work is therefore to use proven methods of behavioral psychology to transform unsatisfactory behavioral patterns in smartphone use into a long-term satisfying user experience. The design concept developed during the thesis shows alternative approaches to how a mobile operating system could be structured and work for users suffering from routines caused by habit-forming products.



PROBLEM STATEMENT

For an increasing proportion of users, most interactions with the smartphone are triggered by habits and internalized routines that they have developed over years of smartphone use. This establishment of habits and routines thereby arises through the process of automating behaviors and actions through constant repetition and contextual anchoring. In terms of smartphone use, this means that certain routines and behaviors emerge over time and become firmly established in usage patterns ^[1]. There are many reasons for the formation of such habits. However, it is clear that certain apps are purposefully designed to encourage habits and engage the user's attention ^[2].

The practice of habitual interaction patterns can lead to users' actual intentions being forgotten during use and users unintentionally drifting off into other interactions. This, in turn, can lead users to perceive their own behavior as unpleasant, disruptive and make them feel that they have wasted their time. In addition, most users are not aware of how much they are influenced by their habits and routines and how these affect their interaction with the smartphone ^[1]. Until now, there has also been no way for users to get an overview of their adopted routines or any way to change or adjust them. This poses a significant problem, as it does not allow users to consciously control their interaction habits and therefore shape their interaction with the smartphone themselves.

CONCEPT AND ANGLE

Our work aims to present a revised version of the current status quo of mobile user interfaces for smartphone users who have fallen into routines due to years of use and are thus dissatisfied with their own user behavior. Our work is aimed at individuals who notice how they digress, miss intentions, fail to follow through on plans, and sometimes wonder themselves how much precious time they waste through constant smartphone use. Our user experience is designed to break the assumed routines and encourage users to be more intentional in their interactions. As a result, interaction with the smartphone should become more meaningful, purposeful and wholesome again. We want to empower the user to exert their own influence and build new behaviors and habits that the reflective user will then perceive as satisfying. To do this, it is necessary to shift the focus from the trigger of one's behavior to achieving the desired outcome, allowing routines to become intentional actions again.

With our work, we try to encourage the user's desired behaviors and provide everything necessary to achieve them. Our goal in designing the user interface is to focus on the user's desired outcome and the positive effects associated with it, rather than focusing on the nega-

tive behaviors. Unlike other projects, we are primarily trying to promote success and progress rather than addressing the undesirable behaviors through pure reduction and constraints. In addition, we see the opportunity to create another level of motivation by having the user share their changes with friends and their environment and collectively work towards achieving them. By doing so, we hope to create a long-term, satisfying user experience that efficiently fulfills the user's actual intentions.

MOTIVATION

One of the main reasons for choosing Compulsive Smartphone Usage as the topic of our bachelor thesis was our own affliction. We both see our own behavior as problematic and feel a dissatisfaction in our usage with an accompanying need for change. We are distracted countless times a day by our smartphone and feel a slight nervousness and insecurity as soon as we don't have our smartphone nearby. We are only too happy to lose ourselves in all the different possibilities and interactions that our smartphone offers and often see the smartphone as a source of relaxation that makes us forget about the sometimes stressful daily life. Looking at our cell phones often makes us forget the time, and before we even realize it, it's already one o'clock in the morning, even though we had planned to go to bed earlier. In addition, we notice that during everyday smartphone use, our actual intentions fade into the background and we digress to unwanted interactions. And despite our repeated determination to break away from time-consuming apps like Instagram, we find ourselves either transferring the behavior to other apps to compensate, or we relapse and download Instagram from the app store again.

However, it is by far not the case that we are the only ones who have developed such behavior or stand out extremely with our screen time. Through the exchange with our immediate environment and on the basis of studies, it becomes clear that the majority of smartphone users are affected by this behavior to varying degrees. ^[3-6] If we consider that two thirds of the entire population uses a smartphone, it quickly becomes clear that this behavior is not only an isolated and local problem, but that this problem extends across the entire planet and is therefore to be taken very seriously ^[7]. We consider the problematic use of digital media to be one of the greatest problems of our time, which we must necessarily find a better way of dealing with in order to achieve a healthy society in the long term.

Problematic use of digital media is an issue that is becoming increasingly common and well-known in our society. Many people now have vague knowledge or have had their own experiences of the negative effects that the enormous consumption of digital and social media can have ^[8]. The frightening thing, however, is that despite this aware-

ness, there are no real countermeasures or solutions on a larger scale to reduce or avoid the extreme potential for addiction ^[9].

Changing the current situation seems to be a rather helpless matter, since the attention we pay to our smartphone is the most important factor for the revenues of the big tech companies, which they consequently try to maintain ^[9, 10]. Nevertheless, we would like to find a less harmful way and solution approaches for society to deal with this complex, seemingly unsolvable problem. As interaction designers, we have a fundamental interest in graphical and conceptual design of mobile user interfaces as well as interacting with them. In addition, we have a strong interest in the design processes and algorithms developed by large tech corporations to capture our attention. We think that, especially as interaction designers, we have a responsibility to address the dependence on the smartphone and other digital media, and to help create and promote a wholesome balance in the digital world.

BACKGROUND RESEARCH

This chapter of the background research deals with various topics related to *"Compulsive Smartphone Usage"*. With the goal of providing a broad and detailed overview, different aspects of the topic were examined. First, we tried to gain a deeper understanding of how behavioral addictions are formed in the first place, what their causes are, as well as what happens in our bodies during the process. In doing so, we refer to the neurotransmitter dopamine in connection with digital media and how the Attention Economy exploits the theories on addiction development for its own interests. We then analyzed existing approaches in the field of compulsive smartphone use, which try to address the behaviors that have partly emerged from their own industry and have developed corresponding principles. We also conducted an interview with Brita Thelitz, an expert in the field of behavioral psychology, and drew some exciting conclusions.

Pleasure, Reward and Dopamine

Origin and Effects:

When studying addiction and behavioral problems, it is important to become familiar with the chemical messenger dopamine. As we look into the topic of Compulsive Smartphone Usage, an overview of dopamine is essential, as this chemical messenger frequently appears throughout our work. This chemical messenger is involved in many biological processes, including motivation, learning, and body movements. It also plays an important role in the reward system ^[11]. Dopamine ($C_2H_{11}NO_2$) is produced in a two-step process in the brain. First, tyrosine is converted to L-dopa, and then enzymes convert L-dopa to dopamine ^[12]. The

action of dopamine is influenced by other neurotransmitters and hormones and is essential for normal brain and body function. For example, dopamine plays a key role in regulating reward, motivated behavior, and motor control of the body ^[4]. Deviating dopamine levels are evident through a variety of symptoms. In cases of significant deficiency, characteristic stiff movements are very noticeable. However, a constant depressed mood, lack of motivation and concentration can also be consequences. A common result of a dopamine imbalance is a shortened attention span and increased impulsivity. Too much dopamine can lead to problems such as hallucinations, while a deficiency can cause sleep disturbances. Long-term dysfunction of the dopamine system has been linked to several diseases, including Parkinson's disease, schizophrenia, and depression ^[4]. Supplementation with tyrosine, an amino acid found in foods such as chicken, dairy products, avocados, bananas, pumpkin, sesame seeds and soy, may increase dopamine levels in the brain and improve memory and mental performance. Dopamine is released during various activities, such as eating and drinking, especially sweets and other foods high in sugar and fat, as well as physical activity that involves rewards, such as sports or exercise, and sexual activity. In addition, dopamine is also released when goals are achieved, challenges are accomplished, or material rewards are received. While these activities can contribute to an increase in dopamine levels, they can also lead to addiction. To maintain balance, activities with low dopamine release such as social interaction, reading a book, going for a walk, and relaxing in a quiet place should also be practiced ^[4, 13].

Rewards and Addictions:

Similar to animals, we humans are naturally attracted to things and behaviors that stimulate our internal reward system. This is because water, food, and sexuality are not enough to satisfy us as individuals, which leads us to seek greater fulfillment. The neurotransmitter dopamine is an essential component of this activity ^[4]. When a person does something that gives them pleasure, dopamine is released in the brain, which then stimulates them to repeat the action to get the same feeling again. This phenomenon is well known from the mechanisms of gambling machines: When the lever is pulled and a result is obtained, the release of dopamine is at its peak, producing a rewarding feeling. The presence of uncertainty has been identified as a factor in dopamine activity. Unexpected rewards may serve to further increase dopamine neuron activity and enhance positive reinforcement for an associated behavior. When an individual learns the response, their reaction shifts to the cue of the reward alone, with the expected reward having little to no additional effect. When the expected reward fails to appear, dopamine activity decreases,

sending a negative feedback signal to the brain regions involved and weakening the positive association^[4]. Robert Sapolsky has called this phenomenon *"magic maybe"* and drawn conclusions about how it affects our interactions with modern smartphones. When we look at our phone, we may find a notification, which leads to a sharp increase in dopamine levels, followed by a rapid drop afterwards. This in turn causes the brain to crave for more dopamine, which leads us to keep checking our phone over and over again for more notifications^[4, 14].

Feedback Loop

An increasing number of people are spending an excessive amount of time with apps on their smartphones due to the so-called dopamine feedback loop. The release of dopamine increases people's excitement and curiosity and drives their search for information. Kent Berridge proposes two systems: the *"wanting"* system and the *"liking"* system. Dopamine is part of the *"wanting"* system and drives people to act. The *"liking"* system, on the other hand, makes you feel satisfied and interrupts your search for more. However, the *"wanting"* system is more dominant than the *"liking"* system, leading to a constant search and keeping the person trapped in a dopamine loop^[15, 16]. Such a feedback loop is activated, for example, by going into the feed of a social media app. Each interaction feeds the loop, although satisfaction is unlikely to occur. To escape from this loop, another external influence is usually necessary. At the same time, auditory and visual cues that accompany the reward can increase the potential for addiction, as this is fueled by the anticipation of the reward rather than the reward itself. To break out of this cycle, a conscious effort must be made to break it, such as by pressing the lock button and placing the phone face down^[15].

THE ATTENTION ECONOMY

Attention is one of the most valuable resources of our digital age. Compared to the previous period of human history, in which information was only accessible to a limited extent and only available for the few, nowadays, due to the Internet and digitization, we are confronted with an enormous amount of information. Our capacity to absorb information has not changed in comparison to the past, so that the ratio of resources; information and attention, is tilted:

Today we have a greater amount of information than our mental processing capacity can absorb^[17]. Thus, instead of information, the attention span can be described as a limited and valuable resource of society. This is also reflected in the global economy: for it has shifted from a materially oriented economy to one based on the capacity of human attention; the so-called Attention Economy^[18]. Through this

shift, many companies have found that economic value depends on the strength of habits and attention. With endless distractions competing for our attention, companies have begun to adopt new tactics to stay relevant in the minds and lives of users. Social media companies play the most valuable and influential role in the Attention Economy ^[19].

The Attention Economy is a business model in which revenue is generated through advertising, but primarily through the attention of users: The longer the users interact with the platform, or the longer they pay attention to the platform, the more advertising can be played to the users, ergo more revenue is generated. Since «*attention = revenue*», the highest of all goals is to maximize user engagement. So user attention is essential to the success of companies. This motivates them to influence the user and make this intended dependent on the platform. In order to achieve the maximum attention span of the users, two main strategies are mainly used by the companies:

First, through the deliberate design of the user interface, which tries to maintain the user's attention with many features, and second, through the personalization of the content, which is tailored to the user so that he or she is served exclusively appealing content ^[2]. Accordingly, by collecting and analyzing user data, advertising is curated and targeted to maximize the likelihood that the user gets attracted to buy the displayed product.

Collection and Usage of User-Data:

In setting up an account with one of the big tech companies (*e.g., Google, Amazon, Facebook*), users create a digital fingerprint that contains a range of information and online behaviors.

This information can include personal information, browsing history, websites visited, locations, purchase history, email and message history, and information about personal preferences ^[2, 10]. This data may subsequently be shared with third parties, depending on privacy agreements. Social media companies also have their own information network about the behavior of their users. The activities of users on their platforms enable them to draw many conclusions about the personal attitudes or purchasing preferences of their users.

The collected user data is also used to develop customizable algorithms to personalize the user's feed. These personalized feeds make the user engage with the website or app for longer, which means more attention for the ads served, and also generates more behavioral data that again feeds into the algorithm, extending the user's attention span even further ^[2]. All of this leads to users spending more time on social media platforms and also potentially feeling a continuous desire to use these services.

Addictive interface Design:

As indicated above, social media platforms are designed to attract users and keep them engaged with the content and features for as long as possible. To do this, they employ many different techniques based on behavioral and cognitive psychology when designing the user interface. An important example of this is the so-called "*Hooked Model*", where a dopamine circuit is used to attract and engage the user. It was designed for habit-forming products and describes a flow in which the user goes through four phases:

Trigger, Action, Variable Reward, and Investment. The Hooked Model was formulated by Nir Eyal, which he describes in detail in his publication titled "*Hooked - How to build habit forming products*" [20]. In the following segment, we will provide a brief overview of the Hooked Model and its constituent phases.

The 4 Pillars of the Dopamine Cycle

Triggers:

There are two types of triggers. External and internal. External triggers are actively set stimuli that actively make the user aware of the product. These can be emails, links or push notifications, for example. Internal triggers, on the other hand, do not require an external stimulus. If a product is associated with a feeling, a thought, or an existing routine over a longer period of time, users automatically access the product based on internal triggers. Internal triggers are thus triggered by the user's own thoughts or emotions associated with the product. Through constant repetition of external triggers, users begin to form internal triggers through associations. e.g. When my cell phone rings I think, "*Oh, Maybe I got an exciting or important message.*"

Action:

After the trigger comes the intended action. To make sure a user performs an intended action, the behavior designer tries to make the action as simple as possible. Here, the goal is to make sure that the user acts as the product specifically intended and that this one-time action becomes a habitual use and that the product is integrated into the everyday life of the user.

Variable Reward:

The action is followed by a reward for the user. Already with the expectation of the reward, the dopamine level increases. It is important here that the reward is used variably, i.e. that it is always different, since the surprise effect and its impact on the dopamine level is essential for the hook effect.

The same principle can be found, for example, in casinos with gambling machines.

Investment:

In the case of investment, the user is asked to perform an action himself and thus encourage the user to run through the hook cycle again. This can be, for example, the creation of a tweet. With investment, the goal is to give the user a reason to invest time and effort in the product or service so that they can benefit from it the next time they use it. The more time and effort we invest, the more we value the product. Through responding and through the engagement of the community, the investment phase then in turn lays the foundation for a new trigger that relates to the investment made previously.

Looking a little closer at well-known platforms, the dopamine cycle technique can be seen in various design features. One such feature is the infinite scroll feed, which allows for endless scrolling without having to navigate to a new page. The constant availability of new content ensures that the user remains engaged and invested in the platform. Additionally, the use of a like button provides an immediate sense of gratification and validation, which in turn leads to an increased desire for continued engagement. Furthermore, the pull-to-refresh feature capitalizes on the pleasure of anticipation and the element of surprise by offering the user an unpredictable stream of content. This feature is designed to elicit excitement and anticipation, thereby reinforcing the user's desire to stay engaged with the platform. Another example of dopamine cycle features is the use of streaks and login rewards. These features are designed to create a sense of accomplishment and achievement, thereby providing the user with a rush of dopamine. The frequent reminder emails also serve to maintain engagement and promote continued use of the platform ^[2, 19]. The presented design features serve as a mere representation of the techniques that utilize the dopamine cycle. Overall, the use of these techniques in platform design has become increasingly prevalent in recent years.

Persuasive Design / Technology

Persuasive design is a design approach specifically designed to influence user behavior and intent through the use of design elements in the user interface. This allows large tech companies, such as Alpha and Meta, to pursue their own interests and goals ^[21]. As explained in the chapter about the Attention Economy, user attention has become the most valuable commodity of our time. In the attention economy, social media companies compete for our attention and shape our dai-

ly behavior with our smartphones. The longer we spend on their platforms, the more attention we pay to their platform, the more data can be collected and sold to advertisers. By designing their products and services using persuasive design methods, companies try to achieve the longest possible attention span of users. In doing so, persuasive design draws on the fundamental principles of human psychology and the findings of behavioral psychology. It attempts to trigger feelings such as security, the desire of belonging, social affirmation, or attention in the user in order to bind him or her to the digital product [22].

In doing so, persuasive design often targets the user's vulnerabilities, which can lead to encouraging compulsive behavior and impairing the user's autonomy and well-being [19]. As users, however, we are often unaware of how influential digital services are designed and how much effort is spent in persuading users. Behind these services are psychologists, designers, and other experts who conduct countless tests and make a multitude of decisions to ensure that the user's attention is captured and maintained [21].

In the following section, we will take a closer look at some persuasive design methods that are strongly based on the basic principles of behavioral psychology. In doing so, we will strongly follow the findings of Deniz Cemiloglu et. al [22].

According to Deniz Cemiloglu et. al [22], a persuasive design system consists of four categories of design principles:

Primary support

- Design principles that support and simplify the conducting of activities.

Dialog Support

- Design principles that motivate and remind the user to achieve a goal during use.

Social support

- Design principles that motivate specific actions through social influence.

System Credible Support

- Design principles that make the system trustworthy and therefore more convincing.

Primary Support:

Primary support thereby includes design principles that aim to reduce the effort required by the user to perform an intended behavior. One approach is to minimize the number of steps required to perform an action in order to reduce the user's ability to

refrain from the action.

Another principle of primary support is the personalization of content to tailor it as accurately as possible to the user's needs. Thereby, the user's feed is optimized based on his or her interests in order to encourage him or her to continuously engage with the content offered. This in turn can impair the ability of self-control and lead to excessive use.

Dialog Support:

Dialog support includes several principles such as praise, reward, reminder, suggestion, and liking. The principle of praise can come in the form of words, symbols, or sounds and acts as positive reinforcement by acknowledging the user's progress. In this regard, a parallel can be drawn with online gambling, where the principle of praise is also used to make the user feel positive and encourage them to continue playing.

For individuals who use these platforms excessively to boost their self-esteem, the association between self-worth and success in the game can lead to excessive gambling.

The reward principle is one of the core factors of persuasive design, as it can influence the user's behavior to a great extent. Every time a user receives a reward in the form of likes, digital points or coins, the reward center in the brain is activated and dopamine is released. The tolerance that develops over long-term use leads to the user needing more stimulation and therefore using the digital platform with greater frequency.

These rewards are associated by the user with very positive experiences, which again makes it more likely that they will interact with the digital platform. Variable rewards that occur at unpredictable times are particularly effective and thus increase the release of dopamine. The excitement of rewards on digital platforms can lead people to value experiences in the digital world more highly and neglect real life as a result.

Reminders can remind users about their target behavior and thus increase the likelihood that they will achieve their goals. However, visual or audible notifications are much more likely to distract users from their goals and intentions and, in a sense, tie them to digital platforms through constant notifications.

Moreover, notifications act like rewards, as a positive expectation is associated with each notification. Notifications therefore function like a variable reward system. Ubiquitous networking and the ability to receive notifications anytime and anywhere can also increase social pressure to respond to messages and thus reinforces engagement with the platform.

Suggestions can act like notifications as a call to action to encourage the user to perform certain actions. Suggestions that are optimized by the user's own data supply through algorithms can promote longer consumption behavior, similar to the principle of personalization through the embedding of user-relevant content.

The design principle "*Liking*" in the field of persuasive design refers to the importance of the visual attractiveness of the system. According to Robert B. Cialdini ^[23], attractiveness is one of the main factors for influencing and persuading people. Similar to advertising and product placements, a visually appealing digital platform can motivate interaction and engagement. The visual attractiveness of a system can also help the user to associate the system with positive emotions, which in turn can lead to more frequent use.

Social Support:

Another important aspect of persuasive design is the category of social support, which also consists of various design principles. One such principle is social learning, in which a person is motivated to perform the same behavior by observing others performing a certain behavior. Individuals who spend excessive time on digital platforms may therefore have friends who share the same excessive behavior.

Another principle used is the Social Comparison. This persuasive design element refers to the motivation of users to perform certain behavior by allowing them to compare their performance with the performance of others. In particular, people who have a high social comparison orientation are especially predisposed, which can lead to increased usage.

The design principle of competition is another concept in persuasive design based on the natural human urge to compete with others and thereby be motivated to adopt a certain behavior. The principle of competition is based on self-improvement and the desire to achieve certain accomplishments and protect one's authority over others. The principle of social comparison, mentioned earlier, can further help to promote competition.

On social media platforms, likes, follower counts, and comparisons with other users can be used to create competition and encourage people to use the platform. Games can also trigger competition and motivate players through leaderboards and awarding badges.

In the design of persuasive digital systems, the normative influence plays also an important role. The system provides normative information about the target behavior in order to influence the behavior of a person. Two types of norms can have this influence.

Descriptive norms refer to the behavior that is perceived as common and appropriate, regardless of any moral component of the members of a social group or society ^[24]. When people see other people exhibit a certain behavior, they may tend to adapt their own behavior to those norms. For example, observing other users constantly staring at their cell phones may lead one to pick up the cell phone more often as well.

Injunctive norms refer to people conforming to behaviors that are approved upon by others. If a user observes that other users positively value or reward a certain behavior, this may lead him or her to want to perform that behavior as well. For example, the number of likes and comments under a post on a digital platform may motivate the user to create similar content. Digital platforms can easily transmit these norms and thus reinforce the influence on the user's behavior.

The principle of recognition also plays an important role on digital platforms. In particular, people with low self-esteem can benefit from the acknowledgment they receive in the form of likes, points or other virtual rewards on the platform. This recognition can help to promote and improve their self-concept, which in turn can lead to increased use of the platform.

System Credible Support:

Another significant factor in persuasive design is authority. By using authority figures such as influencers or famous personalities, new functions or products can be promoted. Users build trust in the service because authority figures often act as role models as well and thus convey credibility. This increases the persuasiveness of the system or the product.

To conclude, persuasive design is an incredibly powerful tool for designers and companies to influence user behavior. In doing so, persuasive design gets users to commit to a system longer than conventional ones and can also promote negative and compulsive behavior. However, Persuasive Design can also be used in a positive setting. It is therefore important to emphasize that persuasive design does not always have to be negative and can also be applied in the interest of the user, such as promoting the user's motivation to exercise or to quit smoking. However, it can generally be said that large platforms and media groups use persuasive design approaches mainly for their own interests, which often do not correspond to those of the users.

Theories of Addiction

The excessive and compulsive use of digital technologies is very similar in origin to behavioral or substance-based addictions. Since we want

to examine the area of compulsive smartphone usage in more detail, it is therefore important to have a basic knowledge of the various causes and patterns of addiction.

There are countless theories on the development and persistence of addiction and addictive behavior, all of them have different approaches and look at the development of addiction from different perspectives. Accordingly, there is no single theory that explains human addictive behavior. Rather, it can be assumed that the many biological, personal, social, and environmental factors are interrelated and together can shape and explain an individual's addictive behavior.

In the work of Deniz Cemiloglu et. al ^[22], eight factors influencing addiction were identified and divided into biological factors, predisposition, learning, motivation, decision making, self-regulation, psychosocial factors, and contextual factors. In the next sections, we will briefly discuss each factor.

Biological Theories:

These theories state that addiction is primarily a brain disease triggered by the disruption and external intervention of dopamine reward circuits and other neural circuits. When drugs are taken, for example, the same natural reward circuits are activated. However, drugs release an extraordinarily large amount of neurotransmitters, which has the effect of reducing the sensitivity of the usual, natural release of neurotransmitters, which in turn can lead to addiction to the trigger(*drug*). Incorrect regulation of dopamine and other neurotransmitters can result in increasing the reward and motivational value of the substance and decreasing inhibitory control, which in turn leads to compulsivity.

Predisposition Theories:

Individuals may have certain genetic predispositions that increase the likelihood of developing addiction. Character traits or personality traits such as approach traits (*sociability, sensation seeking, and impulsivity*), as well as avoidance traits (neuroticism/emotion control, stressful life experiences, or low life satisfaction), may have an impact on increasing the likelihood of addiction development. In addition, sociodemographic characteristics, such as level of education, income level and occupation also play a role.

Learning Theories:

In this section, addiction is described as a learned response in which the connection is made between a behavior and the resulting positive effect. This then goes so far that continuous addictive behavior becomes a habit and thus an unconscious action. Social learning theory explains addiction as a learned response brought about by observing others. For example, addiction may

develop when the environment or peers have a positive attitude toward addictive behavior, which is then adapted.

Decision-Making Theories:

These theories suggest that addictive behavior is based on decision-making. In this regard, the dual-process theory assumes that there are two types of decision-making. On the one hand, the intuitive kind, which happens through rapid processing based on mental shortcuts, and on the other hand, the rational kind, which happens through slow processing based on reflective and logical behavior. In the intuitive type, although the process and effort of decision making is very small, it is very prone to decision bias due to the heuristic type. The rational type, on the other hand, is based on analytical processes, where the decision maker arrives at a decision by weighing the advantages and disadvantages of possible options and finally chooses the option that suits him best. In this type, however, addiction can arise when individuals consciously place a higher value on events that are closer in time, even though they are fully aware of the long-term consequences and implications of the addictive behavior.

Motivation Theories:

The motivational theories state that drug addiction can be developed due to various motivations. The motivations that are mentioned are: Achieving pleasure, self-medication, or fulfilling needs such as social identity and belonging.

Self-Regulation Theories:

Self-regulation theories assume that addictive behaviors result from a lack of self-control, for example, because the ability of own goal setting and self-monitoring is impaired. The likelihood of self-regulating against addiction is thus lower because of a preference for gratification goals over self-relevant goals and because of difficulties in monitoring one's consumption.

Psycho-Social Theories:

Psycho-social theories state that addiction can arise from social bonds and social influences. People constantly try to conform to social norms in order to secure social advantages. As elucidated in the chapter on «*Persuasive Design*», addiction theories also posit the existence of two distinct types of norms that may exert an impact on an individual's behavior. The first is the descriptive norm, which refers to the perception of the frequency or majority of addictive behavior in the social environment. Which means what the majority practice is considered appropriate. The second norm that influences addictive behavior is the injunctive norm. This refers to the perception of what behavior is appropriate or approved by others.

Now, if there is high approval of addictive activities in the environment, there is greater susceptibility to acceptance of the addictive behavior, and one's own resulting addiction.

The concept of identity also plays an important role in psycho-social theories, because depending on the person's sense of who they are, how they see themselves, and where they feel they belong, the individual may identify with addictive activities and find themselves in an addict role.

Contextual Factors Theories:

These theories state that vulnerability to addiction is exacerbated by broader social environmental factors. These factors can generally be divided into three categories.

- 1 Community factors
- 2 Media and advertising factors
- 3 Political and legal factors. Each of these factors can have a direct or indirect impact on the development of addictive behavior.

Silicon Valley Solution Approaches

Nearly half of all daily smartphone interactions occur on Alphabet or Meta services. Likewise, users increasingly report an unsatisfactory relationship with their smartphone, which, similar to drug abuse or gambling addiction, has negative effects on their psychological as well as physical well-being ^[9]. This unwanted behavior cannot be alleviated by simply putting the device away, and from a psychological perspective, due to the omnipresence of the smartphone in everyday life, is more comparable to a food addiction rather than a drug addiction. Given that abandoning the smartphone is proving to be extremely problematic in today's society. Therefore, the approach to behavioral adaptation should focus on control and moderation of consumption rather than complete abstinence ^[9].

After the initial, well-intentioned introduction of the Internet, companies, especially in Silicon Valley, began to focus on digital advertising, which, among other things, helped to keep the Internet cost-free and to expand it further. The introduction of the smartphone gave the Internet a place in people's pockets which meant that it was always at hand and ready to be paid attention to. The economy of attention was born: maximizing profits by targeting advertising, tracking user activity, collecting user data and changing their behavior. This successful business model continued to spread in Silicon Valley, with the focus increasingly on the customers, the advertisers, and neglecting the welfare of the users ^[19].

Tristan Harris, a former Google employee, voiced his concerns early on about the constant disruption of attention as well as the lack

of respect for how users' time is spent. As a result, he was promoted to product ethicist, but his suggestions for change still went unheeded. As a result, he left his then-employer and founded the Center for Humane Technology to advocate for a more humane design ^[9].

First voices:

The problematic use of digital technology is becoming a mass phenomenon and individuals as well as organizations are addressing the issue. One of the first major movements to address the issue was the British Royal Society for Public Health (*RSPH*), which announced the first Scroll Free September. A push for young people to take a break from social media. This was followed by movements such as Digital Detox, which seeks a better balance between digital and real life, as well as spa programs where people completely give up their smartphones to experience nature and their fellow human beings ^[25].

Dumbphones, new cell phones with limited functionality comparable to those before the smartphone era, are achieving popularity and selling in the hundreds of thousands ^[9, 26, 27].

However, not only hardware but also software is expected to provide a solution to the addiction problem. Apps that track time spent on the smartphone, reward systems for low usage, and artificial loading times are all represented.

Mass Manipulation:

At the latest as a result of the 2016 presidential election in the United States and the subsequent Cambridge Analytica scandal, it became clear to society that there was a need for action in dealing with social media platforms. Thus, a public letter from investors was sent to Apple warning of the possible long-term consequences of the new technology ^[9]. This prompted Silicon Valley to take action. Thus, Apple, Google, Facebook, Instagram, and Microsoft all released various features to reduce smartphone dependency. "*Screen time*" with activity reports and app limits to reduce usage as well as a "*do not disturb*" mode were introduced by Apple ^[28, 29]. Google released comparable features as well as "*Wind Down*" mode, which displays content in grayscale ^[30]. Meta services got a spent time indicator and Microsoft tries to minimize distractions by notifications through the "*Focus Assist*" ^[9].

Conflict of Interest:

Alphabet's and Meta's business model is based on having as many people as possible using their services for as long as possible and therefore seeing as much advertising as possible. This allows their services to be used without fees, but is in contradiction to their attempts to reduce the screen time. Not only the pure advertising time, but also the activity and user data ob-

tained through tracking are part of the basic business of the mentioned services and help them to improve their algorithm for more targeted advertising or contributing to further engagement of users ^[19]. Thus, it can be assumed that without a change in the business model, the added features are only a bogus solution for investors. This is also supported by the fact that the offered functions are implemented very superficially. A loveless gray-scale mode, without exceptions of videos or photos, laid over the whole system, as well as a «*do not disturb*» mode, which was previously taken over from the airplane mode, does not look very convincing. Moreover, prolonged unsatisfactory smartphone behavior is mainly caused by the release of dopamine, making it largely difficult for people to resist these impulses and discipline themselves ^[9].

Humane Design / Human protective Design

Due to the rapid growth of the attention economy, the negative aspects and effects on society and users have been intentionally or inadvertently neglected. Widespread smartphone dependency is part of these resulting problems ^[19]. The Silicon Valley companies that are responsible for some of these problems are responding only superficially, even though they have long been aware of the problems internally. Public pressure has prompted them to offer initial solutions. The earlier mentioned Tristan Harris, former Google employee and President and Co-Founder of the Center for Humane Technology, launched, after his concerns were not taken seriously at Google, the movement to promote «*Humane Design*» a set of principles designed to lead to a more conscious use of technology ^[9].

Humane Design is a user-centered design approach that focuses on the needs of users, emotional as well as physical. The roots of Humane Design derive from Human Centered Design, which is widely used in technology, but complements it with greater empathy and compassion. An important principle is to start design problems with the question “*Why?*” in order to better identify the actual purpose of the work and to put oneself in the shoes of the user ^[31, 32]. The goal should be to create solutions that solve users’ problems while addressing their emotional needs. In traditional Human Centered Design, this focuses on making products and services user-friendly and comfortable, while Humane Design focuses on making the product useful and desirable. Humane Design additionally aims to reduce or even prevent stress and anxiety. Humans are the center of attention and should be empowered rather than overwhelmed by technology ^[31].

«If something is a tool, it genuinely is just sitting there, waiting patiently. If something is not a tool, it's demanding things from you. It's

seducing you. It's manipulating you. It wants things from you. And we've moved away from having a tools-based technology environment to an addiction- and manipulation-based technology environment. That's what's changed. Social media isn't a tool that's just waiting to be used. It has its own goals, and it has its own means of pursuing them by using your psychology against you.»

Tristan Harris, President and Co-Founder of the Center for Humane Technology in *The Social Dilemma* ^[33].

Principles:

Humane Design sees technology as an enabling tool, waiting to fulfill the user's intent and then being put away. In this context, the technology fades into the background so that the human can focus on what is important. Design should ensure that the product or service is accessible and easy to use by paying attention to the details, and thereby creating a quality user experience. Humane design recognizes each person's inherent value and understands the environment as a shared home. People with special needs are included, user errors are minimized, and accessibility to products and services is ensured. Supporting research and development in humane design will help to further improve it and make the world a better place. Humane Design follows the following core principles ^[34]:

Empowering

- The design focuses on providing effective value rather than monetary gains.

Finite

- Maximize the quality of time spent by users by limiting experiences and prioritizing meaningful and relevant content.

Inclusive

- Accessibility to the full range of human diversity.

Resilient

- Focus on welfare, preventively reducing potential abuses of a particular design while protecting freedom of expression.

Respectful

- Valuing users' time and attention and people's overall digital well-being.

Thoughtful

- Early problem detection to prevent abuse, protect privacy, and guide people towards healthier digital habits.

Transparent

- Clarification of intentions and honest action which is free from dark patterns.

Approaches and Changes:

In order to make principles of Human Design experienceable, some limited possibilities are already existing today.

For instance, disabling any notifications apart from actual people can achieve a more conscious and intentional interaction with the smartphone. Switching the viewable content to gray-scale reduces micro-rewards from colorful icons during use. Removing social media apps from the home screen and bringing more focus to effective tools, such as maps, reminders, and workout apps, reduces time-wasting habits by making access more difficult through extra steps, meanwhile encouraging reflection. Charging the device outside of the bedroom reduces the temptation to use it at first thing in the morning and helps to build self-discipline.

Even marginal changes made through the influence of Humane Design principles have a significant impact on how we interact and relate with technology. Simply reducing notifications leaves important moments more clearly remembered. Interactions with friends become more long-lived, and reducing micro-interactions lowers stress levels. It is noticeable how apps that earn money through attention, distract from real issues to earn the user time by playing with the desire for recognition and variable rewards. On the other hand, a rewarding approach in for instance training apps can again be meaningful and purposeful and provide real value to the user. Digital experiences are part of our culture and oftentimes, addictive features simply bring pleasure to us ^[32].

Interview with Britta Thelitz

Head of Prevention at the Center for Gambling and Other Behavioral Addictions

To understand more about behavioral addictions and their treatment processes, we contacted the Center for Gambling and Other Behavioral Addictions. After an informal email exchange, we were able to conduct a 40-minute interview with Britta Thelitz, Head of Prevention at the Center for Gambling and Other Behavioral Addictions.

Based on what trigger or reason, do patients report to you?

There are various triggers due to which patients register with us. However, a basic trigger is when the addiction makes it difficult for sufferers to cope with everyday life, or when sufferers notice that they always avoid negative feelings and try to suppress their

addiction. Sleep deprivation due to addiction is also a common problem that patients eventually realize they need to seek professional help for. Another reason for enrollment may be when parents notice their children's academic performance dropping and they become concerned.

Do affected individuals actively seek help or are they introduced to your treatments by third parties?

The majority of those affected do not register on their own initiative, but are registered by their environment. They are registered by third parties, such as friends or family members. In many cases, relatives, for example, set an ultimatum for the person concerned in order to persuade him or her to undergo therapy. Often, concerned parents also contact us, although it is always necessary to put into perspective whether or to what extent the person is really affected by addiction.

How aware are affected individuals of their problem and its impact?

Various symptoms can occur in connection with digital media, which can have an impact on the daily lives of those affected. As already mentioned, a common symptom is that coping with everyday life no longer works properly. Excessive use of digital media can, among other things, lead to a decline in academic performance or postponement of important tasks, which can lead to further stress and overwhelm, which in turn promotes a flight into the usual pattern and social withdrawal, in which the affected person neglects contact with friends and family and instead spends a lot of time online in their own world.

What is the procedure of such treatment? What methods are used? How are such behavioral addictions trained away?

The treatment of behavioral addictions is a highly individualized process that varies depending on the situation. At the Center for Gambling and Other Behavioral Addictions, all four therapists consult with each other and then decide which treatment path is best for the patient. There are different therapy methods. One therapy option that is often considered, for example, is systematic therapy, in which the family or work environment are included in the solution processing. Another option is cognitive behavioral therapy, in which the patient learns to train his self-observation to counteract the negative behavior on his own. It is important to understand that behavioral addictions are due to repeated behavior. The more often a behavior pattern is practiced, the more it burns in as a routine and addictive behavior. Accordingly, the behaviors are trained to a certain extent. However, this means that the behavior can also be untrained again. In therapy, the trigger for the behavior is sought, as it is important to understand what need is being satisfied by the behavior and what motivation lies

behind the behavior pattern. An example of this could be that the behavior is used to suppress a problem. Central to therapy is the analysis of the behavior, its reasons, and its function. In order to develop strategies to overcome the behavior, it is important to know the circumstances and the trigger for the behavior. What need is being satisfied through it?

How do you see the implementation of gambling-like principles in social media apps? (*Reward loop, dopamine feedback loop, algorithms, etc.*) Do you see a need for (*preventive*) education in dealing with these apps?

The implementation of gambling-like principles in social media apps leads to a strong mixing of the two areas, which is of course very problematic, since younger generations in particular also move on these platforms. Also in the area of gaming, intermittent reinforcement, i.e. the classic gambling principle plays a big role. One example is in-game Magic Boxes, where the player does not know what to expect and which therefore apply the same principle. In addition, there are also in-game investments that shift the perception of real and fiction, which in turn reinforces addictive behavior. Against this background, there is a great need for preventive education in dealing with digital media. But to ensure effective prevention in schools, a knowledge base for teachers must be developed. However, the Central Office for Addiction Prevention (*ZSS*) is trying to draw the attention of the media and politicians to the problem and to make young people aware of the issues via SocialMedia (*Instagram Adds, TikTok*). However, given the great need for prevention, these efforts should be further expanded.

Do you have any ideas on how to counteract this?

First of all, it is important to show children and young people that they are influenced by various factors, for example by companies that want to collect their data. Awareness should be created that there are interests and intentions behind it all. Another important aspect is that children should learn to recognize and feel their own feelings and needs. Only in this way can they develop an awareness of what is good for them and what they need for healthy development, and then set healthy development above media consumption. To keep track and make media consumption meaningful or healthy, it can be helpful to create a schedule and allocate time for different activities. We try to push our campaigns more in the digital environment (*TikTok*), using youthful imagery to raise awareness and counteract the problem.

As a person with great knowledge in the area of behavioral addictions, What is your own use of digital media (*smartphone, social media and streaming platforms*)?

I handle my own use of digital media very restrained, especially with regard to data privacy. I always try to ask myself or notice how I feel after consuming digital media and whether it does me any good. Nevertheless, I also see the cell phone as very positive, especially as a useful tool, for example, to stay in touch with other people or to find important information. However, I make sure that I keep enough distance, that my body gets sufficient relaxation and that I don't spend too much time in front of the screen.

How can the phenomenon be explained, e.g. «Revenge Bedtime Procrastination», where one is aware of the negative consequences but still resists? How can this be counteracted?

To counteract this phenomenon, it is important to be aware of how relevant sleep is for the body and what negative effects a lack of sleep can have in the long run. Sufficient sleep is a very important factor for everyday life and has a great influence on how relaxed or how good-tempered you are. It can also be helpful to plan your day more or to better manage the time you have available. How much time do I have? How much time do I take? And perhaps setting alarm clocks during the day for the divisions as well. It's important to take control of your choices, recognize the influence and learn to manage your behavior.

Where do you see potential for new approaches in this area? What needs to change?

Especially in adolescence, many behaviors are formed, which is why early prevention and education is very important. In addition, everyone must develop individual strategies to avoid falling into old behavior patterns. In this context, it is important that there is awareness and thus the structure is built up in the mind itself. And of course I see potential in prevention campaigns to draw attention to the problems at an early stage and to promote exchange.

What needs to change?

In order to bring about change, better funding for prevention measures is needed, as well as greater political willingness or attention to this issue. Certainly, legal changes, as is the case in the area of gambling addiction, would lead to change. However, it is enormously difficult to impose a national law on international companies. In addition, the addictive potential of digital media is still very controversial in politics and society, which also makes change difficult. But it is certainly important to recognize that it is not the cell phone itself that is the problem, but how it is used.

Findings Interview:

The interview with Britta Theliz provided us with significant insights into her professional practice and her understanding of our subject. One remarkable observation was undoubtedly that the majority of patients do not come to her of their own accord, but are registered or admitted by third parties. This illustrates how difficult it is to admit to one's addiction or to even be aware of it. In order to avoid the addictive behavior, it is crucial to take preventive measures early on, to limit the negative behavior and to create awareness of behavioral addictions. The person affected can only change their behavior if they are aware of their addiction. In the case of gambling addiction in particular, the addictive behavior is often not acknowledged for a long time and it usually takes several relapses before the person affected acknowledges their addictive behavior. Another important aspect that is relevant to our work is the treatment process for behavioral addictions. According to Theliz, this is extremely individualized and is based on the patient's needs and symptoms.

There are several treatment options, including systematic therapy, which involves the family and work environment in the treatment process to promote healing, and cognitive behavioral therapy, which trains the patient's self-observation to combat the negative behavior on their own. Central to therapy is the question of the need that is being satisfied by the behavior and the motivation behind it. Another important insight for our work is that the behavior is a learned routine and can therefore also be trained off again.

Related Projects

Society is increasingly discussing smartphone addiction and the problems associated with it. Users feel uncomfortable, delete certain apps, turn away from social media, or seek a way out by abandoning digital media completely. This trend has given rise to a number of projects that are aiming to find a different way of dealing with digital media by restricting it and reducing it to the minimum. Since the problem of compulsive smartphone use is strongly related to behavioral addictions, the following section examines not only projects that are clearly related to smartphones, but also those in the field of behavioral addictions in psychology.

Yondr & Distractagone:

DistractaGone is a device designed to solve the increasing problem of cell phone distractions during conversations and meetings. It is basically a safe for smartphones that allows users to put their phones inside and set a timer for a specific duration.

During this time, the phones are locked and users cannot access them ^[35]. A similar project designed for events with a larger number of people is Yondr. Again, it deals with smartphone distractions. Yondr is a smartphone case that locks and unlocks with a mechanism similar to a retail security tag. These products are used at private events to store cell phones and prevent audio, video, photography and cell phone distractions. Attendees place their smartphones in a case, which is then locked by event security personnel. Afterwards, attendees take the locked case with their smartphone. This way, they still have their device with them, but the functionality is no longer there. Yondr pouches are used at music concerts, theater performances, court hearings, schools, and nightclubs ^[36]. Although locking them away stops the distractions caused by the smartphone, there may be concurrent drawbacks to doing so, which may also be undesirable. For example, important organizational tools provided by a smartphone may be lost, which may even lead to hindrances. At large events, even the safety aspect is no longer guaranteed due to the omission of communication and practical tools ^[37, 38].

In our project we try to avoid the approach of such projects. The approach of these projects are blocking any functionality of the smartphones regardless of any losses, in order to avoid the distractions and other side effects triggered by smartphones. However, since the devices are a large part of our daily lives, it is more important for us to address the quality and awareness of the user and his actions, rather than considering total abandonment.

Figure 1: Yondr Case [39]



Punkt MP02 & The Lightphone:

These are two minimalist cell phones, the Punkt MP02 and the Lightphone II, designed to help users reduce their dependence on technology. Both phones offer basic communication functions such as calling, texting and an alarm clock, but do not include social media or other distracting apps.

The Punkt MP02 is designed for people who want to simplify their lives and disconnect from the constant distractions of social media and other apps. The device has a simple design, a black and white e-ink display and a physical numeric keypad. The e-ink display is easy on the eyes while providing clear visibility even in bright sunlight. The physical keypad makes it easy to dial numbers and send text messages without having to navigate through complicated menus. This also provides long battery life, which means users can go for several days without recharging ^[27].

The Lightphone II takes a very similar approach, but unlike the MP02, it has a black and white e-ink touch display, which thus offers more options for building the UI and makes the user experience closer to the familiar operation of a smartphone. However, it retains the advantage of battery-saving and is easy on the eyes even during prolonged use. In addition, the phone is compatible with popular mobile operating systems and can be used as a secondary phone when the user wants to disconnect from their primary smartphone. It is designed to be user-friendly, focusing on effective tools such as a calculator, a simple music player, and navigation ^[26]. This makes the Lightphone feel more like a viable temporary replacement for the regular smartphone. This allows the user to use the SIM card in the Lightphone over the weekend and still use their usual contacts thanks to synchronization from the smartphone. The MP02 is more like a cell phone from 20 years ago and is accordingly limited in its functionality, which probably makes its everyday use even more inaccessible ^[40, 41].

For our project, we find the dumbphone approach interesting, as they do not give the user a chance to follow the routines and activities they are used to from their smartphones by radically limiting functionality. However, we feel that the lightphone approach is more promising as it still offers the benefits of an adaptive UI through the touchscreen, even if only black and white, which is not the case with the MP02 due to the physical buttons. At the same time, however, this increases the risk of fidgeting through menus without effective intent. The simplicity of the layout, with a lot of text instead of many appealing icons, as well as the focus on effective tools, were also considered as possible approaches for our concept.

Figure 2: Light Phone II [42]



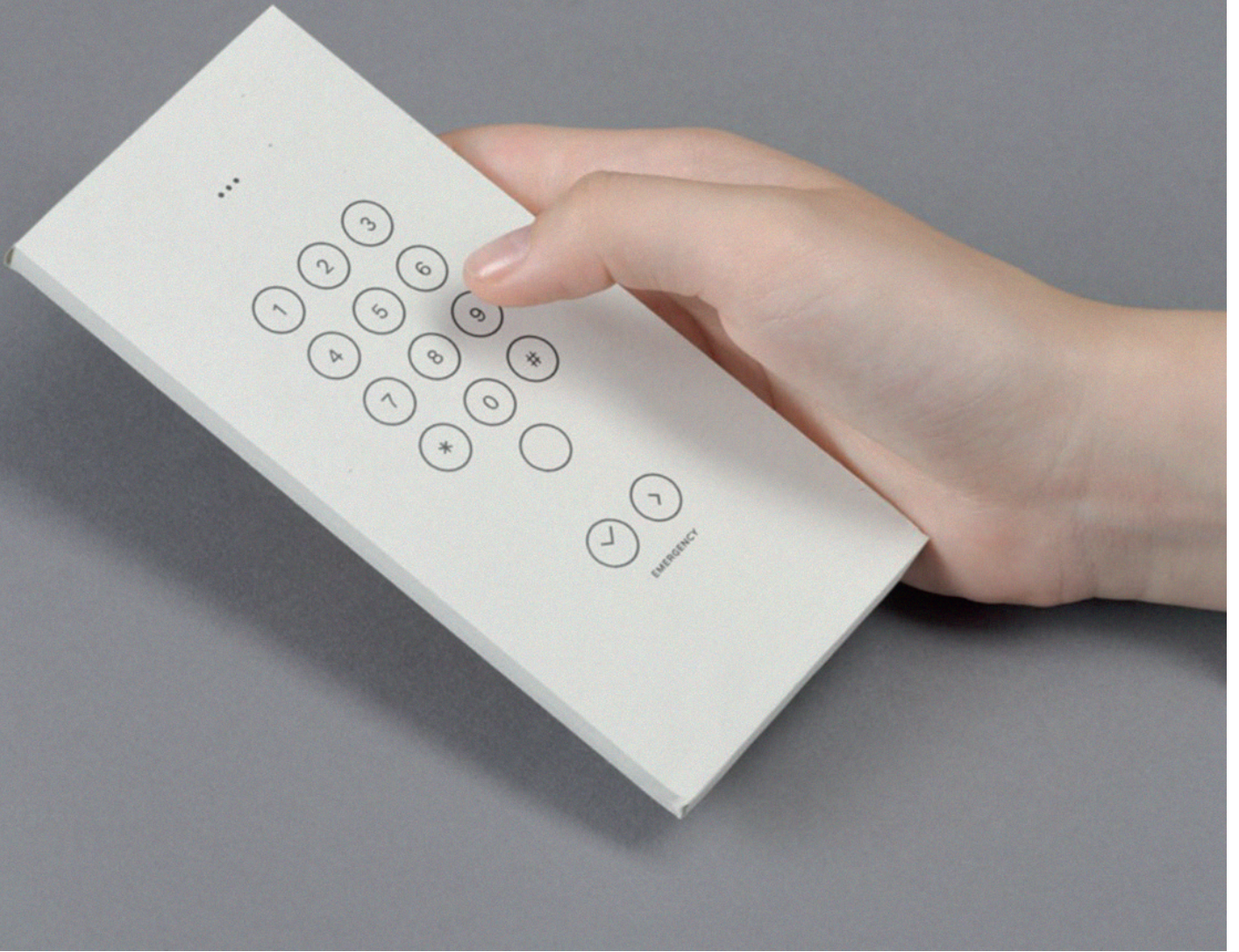
Envelope:

Envelope is a concept that is supposed to help users experience a day without a fully functional smartphone without having to buy a new device. To do so, the smartphone is wrapped in a paper envelope printed with UI elements, which limits its usability. There are two versions of the envelope: one that only allows calls and one that allows photos and videos to be taken [43].

Envelope's user interface is simple and appealing. The first envelope serves as a simple phone that can be used to make and receive calls and select a quick dial contact. A special app on the device takes over the screen and waits for inputs on the numeric keypad. The helpful thing about paper is that it allows light to shine through, enabling the design of an extremely reduced user interface where the printed buttons light up as soon as they are pressed. The second of the two envelopes serves as a minimalist camera that allows photos and videos to be taken, although the result is not directly displayed to the user afterwards. This feature gives a feeling that reminds of a 35mm film camera where you had to wait for the photos to develop. The trigger on the touchscreen works despite the paper layer because the capacity of the finger can be detected through the paper as it is only slightly affected by the cover. The app's user interface is optimized for OLED displays, which means that battery life is hardly affected when the app is running all day. Unfortunately, Envelope is currently only a concept and only of very limited use [44, 45].

In the Envelope project, we see some exciting approaches that change the way we interact with the device in a fundamentally simple and accessible way. The possibility of having multiple envelopes for different applications contributes to a conscious decision about the intention. However, we must also mention that the constraints imposed by the Envelope are very high and probably not intended for everyday use. For us, the considerations made for the UI printed on paper are much more exciting. By simply lighting up, the paper UI becomes interactive. Repeating the input of the phone number by lighting up each keypress could be an exciting approach to make users more aware of how they interact with the smartphone.

Figure 3: Envelope by Special Projects [46]



Das Offline Dorf:

The former influencer and content creator Linda Meixner had enough of the permanent self-promotion, the constant being judged and the constant pressure she experienced through social media. Her professional and private lives became increasingly intertwined, and her constant presence and availability as an influencer began to take their toll ^[47]. Out of dissatisfaction, Linda Meixner undertook a self-experiment in her master's thesis for communication design and tried to last 66 days without a smartphone ^[48]. Following her master's thesis, she founded the Offline Village, a vacation experience, with a smartphone detox of 6 days, in which one tries to promote a healthier use of the smartphone, to intensify one's senses and to perceive one's environment better again. The project seeks to sustainably reduce participants' screen time and improve their behavior with smart devices in everyday life. The entire Detox process is scientifically accompanied and also includes a 10-day pre-care and a 30-day post-care by a team of experts from the field of sports, alpine medicine and health tourism of the private university Umit Tirol ^[25].

Similar to our problem statement, Linda Meixner describes that the smartphone is a tool that is absolutely indispensable in its ability, but that up until now there are no solutions or no approaches on how to pursue a healthy use of the smartphone or how to integrate it into our everyday life without letting it completely occupy us or negatively influence our behavior. With the offline village, she connects the weaning from the negative behavior of the smartphone with an experience, a place of relaxation, a spa and brings the topic in a very contemporary, "appealing" wellness, self-care context, which paradoxically again falls very much under the influencer/social media division.

The project is interesting for us in the sense that it uses with the 6-day detox a radical variant of weaning. In addition, it is exciting because it very much contradicts our idea and approach to the problem and thus represents a strong contrast for our work. In contrast to the previously mentioned approaches, which are at the expense of functionality, we would like to tackle the problem of the usage behavior at the root cause, the internalized routines.

Allen Carr's Easy-Way Programme:

Allen Carr's Easyway program is a smoking quitting program based on the idea that smoking is not just a nicotine addiction. The focus of the program is to concentrate on the psychological addiction rather than the physical. The program teaches smokers how to break the psychological link between smoking and pleasure and to understand the real reasons for smoking. Participants also learn how to deal with the triggers that tempt them to smoke. The program offers group sessions or individual coun-

selling with an Easyway facilitator. It emphasizes showing smokers in more detail why smoking is addictive and that it is possible to quit without feeling deprived or suffering withdrawal symptoms. The program also provides support and counseling to those who have successfully quit smoking and helps them stay smoke-free forever. The Easyway program is successful because it is based on a completely new way of looking at smoking, which aims to help smokers make positive changes and free themselves from smoking, rather than fighting their inner desire ^[49, 50].

The Easyway program pursues the following sequence ^[49]:

Recognizing the negative effects of smoking:

- The first step of Allen Carr's Easyway program is to help smokers recognize the negative effects of smoking on their health, finances, and relationships. This step helps smokers recognize the harm smoking can cause and the reasons why they should quit.

Replacing the smoking habit:

- The second step of the program is to help smokers replace smoking with healthier activities. These activities can include physical activities, relaxation techniques, and social activities.

Understanding the truth about addiction:

- The third step of the program is to help smokers understand the truth about addiction. This step helps smokers recognize the fact that nicotine is an addictive substance and that quitting can be difficult.

Breaking the psychological dependence:

- The fourth step of the program is designed to help smokers overcome their psychological dependence on smoking. This step helps smokers identify and challenge the false beliefs they have about smoking and realize that they can successfully quit.

Build self-confidence:

- The fifth step of the program is designed to help smokers build self-confidence. This step helps smokers recognize their own strengths and to believe in their ability to quit smoking and stay smoke-free.

Retraining the thinking pattern:

- The sixth step of the program is designed to help smokers re-train their thinking. This step helps smokers develop new, healthier beliefs and habits.

Building a Support Network:

- The seventh step of the program is to help smokers build a support network. This step helps smokers surround themselves with positive influences and find resources to help them stay smoke-free.

Allen Carr's Easyway program is an extremely interesting and successful project for our project with a comparable context. We are thinking about integrating several points from the program's structure and approach into our concept for smartphones. One of the main features is the recognition of the true reasons and intentions behind certain interactions. When the user is aware of this, the interaction can move from automated routinized processes to intentional, conscious action. The social pressure a smoker faces to quit can be compared to the justification about constant accessibility with smartphones. We also see great potential in strengthening success through a supportive network.

Improving Inhibitory Control Abilities - ImpulsE - A Promising Approach to Treat Impulsive Eating:

The study by Hanna Preuss et al. (2017), examined the effectiveness of the ImpulseE training program in improving inhibitory control skills related to impulsive eating behaviors of people with obesity or eating disorders. Inhibitory control describes the ability to stop oneself from engaging in impulsive or automatic behaviors and instead choose an appropriate response^[51, 52]. ImpulsE training in this context is the cognitive based training program developed by Hanna Preuss et al. to improve this very inhibitory control specifically in the sector of impulsive eating behavior. The training program of the study includes three treatment phases in which a variety of techniques in the field of CBT: «*Cognitive Behavioural Therapy*» are applied. In addition, the program includes an eating-specific training variant of SST:

«*Stop-Signal Task*» in which participants must suppress an initiated action already guided by the impulse^[52, 53]. Basically, SST is a simple reaction time test in which the participant must respond to a visual stimulus by pressing a button. In occasional samples, an acoustic signal (*stop signal*) is used to indicate to the subject that he should stop responding to the stimulus.

In this case, the subject is supposed to respond to the stimulus as quickly as possible during the tasks, unless the stop signal is signaled to him. This variant can on the one hand measure the inhibitory control ability, and on the other hand can be used to improve it^[52, 53]. The study by Hanna Preuss et al. was successful. The ImpulseE training program resulted in significant improvements in overall eating disorder and frequency of over-eating. Moreover, at a 3-month follow-up, the results remained stable. In particular, subjects with BED: «*Binge Eating Disorder*» showed a significant reduction in binge eating^[53]. However, the study indicates that further studies are needed to substantiate the effectiveness of the program.

Even though this program is designed for eating disorder pathology and impulsive eating behaviors, the approaches and methods used are very exciting for our BA. We think that inhibitory control, the ability to control impulsive or automatic be-

havior, plays a crucial role in certain behaviors when using the smartphone. In relation to our bachelor thesis, we wonder how the methods for improving inhibitory control, which originate from psychology, can be translated or transferred to our topic of compulsive phone usage. Therefore, we ask ourselves whether psychological approaches can be used to identify possible solutions that can be integrated into a user interface.

Motivational Interviewing:

Motivational interviewing is a counseling method that originated in addiction therapy but can also be applied to other areas. The goal is to strengthen a person's own motivation and commitment to change. Typically, a cooperative, goal-oriented conversation takes place in which changes are discussed. This usually involves behavioral changes such as giving up old habits, forming new habits, or incorporating new behaviors to existing habits. Occasionally, lifestyle changes are also required. However, it is important to note that overcoming an addiction is very much a matter of willpower. It is therefore important to adopt a basic attitude of acceptance and empathy. The emphasis is on the autonomy and self-determination of the other person, since the responsibility for change lies with him or her. The aim of motivational interviewing is to strengthen personal motivation for change and to recognize and resolve ambivalences without overtaxing the counterpart ^[54].

People are rarely unmotivated, but often ambivalent. If a client wants to strive for change, they should ask themselves: Why do I want to achieve this change? What are my reasons for doing so? What benefits will I gain from it? What is holding me back? Behind the ambivalence, there may also be unfulfilled needs that need to be identified. At the same time, it is important to analyze the client's unfavorable behavior, as even this behavior often offers an underlying benefit. It is important to explore the valid reasons for the harmful behavior and to try to fulfill those reasons or needs through positive behaviors. It is also important to think for oneself about the value of changing the behavior. Motivational interviewing is an attitude rather than a specific technique. The Rubicon model describes the process of decision making and shows that before crossing the Rubicon there is often ambivalence. After crossing the Rubicon, the problem arises that the consulting person is already at a different point in the process. This is the most common reason why consultations are not successful. The challenge is to be restrained and wait until the decision itself has been made by the patient. In motivational interviewing, change talk plays an important role that must be recognized by the expert. There are several questions that can be helpful in achieving this. These include questions about desires, reasons, and motives for change, weighing pros and cons,

exploring visions of the future, and asking concerns and retrospective questions. These dissonances often manifest in statements that speak against the change (*sustain talk*) or indicate problems in the interaction/relationship. These dissonances may be expressed in formulations of objections, interruptions of the person doing the consulting, denial, rejection, or ignorance. Finally, to strengthen the Change Talk, the Confidence Talk is used. This strengthens confidence in one's own possibilities and therefore one's confidence. Existing resources should be used and buried resources should be brought out again in order to promote confidence talk and to be able to react to it ^[54–56].

Our project focuses on how to deal with the habits and ambivalences of smartphone use. We have found that many users make subconscious interactions that they later look back on and perceive as unsatisfactory. This leads to a frustrating user experience and that users are often disappointed with their own behavior ^[1]. To identify these habits and routines, we see motivational interviewing as a possible building block for our concept, which has already been successfully used in behavioral therapy.

Findings so far

The projects studied can be divided into two categories. The first half of the projects examined follow a reductive and restricted approach with a clear reference to smartphones. The second half, on the other hand, is located in the field of behavioral addictions in the field of psychology and deals primarily with the question of how such negative behavioral patterns and habits can be changed for the better.

In our approach, we try to adapt the ideology from psychology in order to thereby transform unsatisfactory behavior patterns in smartphone use into satisfactory behavior using proven psychological methods. Thus, our approach results in making users aware of what their routines are and how they can change them to develop a healthier relationship with their digital devices. We want to give the control back to the users and encourage them to make conscious decisions instead of being driven by habits. Accordingly, we view the status quo of mobile user interfaces, the basic structure of the operating system, and the design all around as unsatisfactory. Operating systems used by billions of users every day seem to distract more and more people from their real intentions, leaving them frustrated as they perceive their time as wasted ^[1, 7]. Although habits could be influenced by deliberate design, current operating systems do not allow users to do so ^[2, 9].

Users should be able to decide for themselves which sequences should be internalized and which should continue to be executed as conscious decisions. Our design concept shows alternative approach-

es of how a mobile operating system could look like for users who are afflicted by routines through habit-forming products, in order to create a long-term, pleasant user experience.

PROJECT DEVELOPMENT

Observations / Interviews

Fly on the Wall:

The «*Fly on the Wall*» method is an observation method in which the researchers, like a «*Fly on the Wall*», observe the behavior of people in a natural environment, in this case in a public space, without being noticed. In this method, participants are not actively involved in the study or informed about the observation so that their behavior is not influenced. This method allows researchers to observe the actual behavior of people in everyday life without the subjects being aware of being observed.

The advantages of the «*Fly on the Wall*» method are its more natural and genuine observation of behavior. Since the subjects are not aware that they are being observed, they show their normal and spontaneous behavior in public spaces, especially in relation to the use of digital media such as smartphones. This allowed us to get a realistic picture of how people use digital media in public spaces and how they interact with their environment.

During our observations of digital media use with a focus on smartphone use using the «*Fly on the Wall*» method in public spaces, we found interesting results. A common observation was that many people were exclusively either talking to someone or interacting with their smartphone. It seems that the smartphone has become an integral part of social interaction behavior, even being in public. Eating alone was often only possible with a digital medium such as a smartphone. It seemed that people could not handle being alone and used the smartphone as a distraction or for company. Another observation was that there was always additional input for people, whether it was in the form of talking to other people or using digital media. It seemed that people had difficulty just being in public without being distracted or appearing preoccupied. The question arose as to why being alone in public was so uncomfortable and why people had difficulties in simply “doing nothing” or «*just waiting*».

It was also observed that people who were alone in public and did not use a smartphone were often perceived strangely. It seemed that not using digital media in public was unusual and attracted the attention of others. This illustrates that the use of digital media in public spaces is seen as socially accepted and considered normal by many people.

An interesting observation was also that although Person B sat down to Person A and tried to start a conversation, Person A nevertheless continued to use her smartphone and did not actively engage with Person B. It seemed as if the smartphone had a strong attraction to Person A and she continued to remain fixated on her smartphone despite the physical contact with Person B. Person B attempted to initiate a conversation several times, but without success, as Person A remained engrossed in her digital world.

It was also observed that the smartphone served as a communication tool to access or share information. For example, it was used to look up the location of appointments or to locate the location of classrooms. It also served as an orientation tool to find directions or to retrieve information about the surrounding area. It was noticeable that people who were alone and had nothing to do often resorted to using their smartphones to keep themselves occupied. Boredom and «*doing nothing*» seemed to be unpleasant, and the smartphone was used as a means to avoid or bypass these unpleasant feelings. Another interesting behavior was that people often entered or left places with their smartphone in hand, even partially with the screen turned off. Thus, the smartphone seemed to be a kind of safety haven that gave people a sense of security or comfort in unfamiliar or uncomfortable situations. It was also observed that people who were alone in public and using their smartphone were often seen as «*busy*». It seemed that being alone in public without using digital media was not considered busy or productive enough. Thus, the smartphone was viewed not only as a distraction tool, but also as a social norm for appearing «*busy*» or «*productive*».

In summary, our observations on the use of digital media with a focus on smartphone use by using the «*Fly on the Wall*» method in public spaces show that the smartphone plays a central role in people's behavior in public. It is used as a tool for communication, orientation, occupation, and as a safety-providing object. It also appears to be socially accepted and, in some cases, considered as the norm to appear busy or productive. However, this also raises questions about whether people have difficulties simply being alone in public without using digital media, and how this use affects interpersonal interactions and social dynamics.

It remains to be noted that these observations are based on a limited number of observations and further research is needed to provide a more complete picture. Nevertheless, they provide interesting insights into the behavior of people in public spaces in relation to the use of digital media, especially smartphones, and raise questions about how our increasingly digitized world is changing our perceptions of time, space, and interpersonal relationships.

Interviews:

In order to gain further insights into the use of smartphones in public spaces, in contrast to the «*Fly on the Wall*» method, we effectively asked people about their smartphone behavior to get an idea of their own views. To do this, we conducted interviews with various people in public spaces to explore their use of digital media, particularly smartphones.

Persona 1

- was a young man whom we talked to while he was waiting for the streetcar No. 4 in the direction to Altstetten and was not using his smartphone. This appeared remarkably unusual to us. He told us that he had deleted his Instagram account two days ago because he noticed that the digital contacts were not very «*real*». He felt the interaction in the digital space was insignificant and wrong. He enjoyed the silence in the streetcar and it seemed like he was mentally preparing for a meeting, as he mentioned that he was going to meet someone and therefore did not need a smartphone at the moment.

Persona 2

- was a person we talked to in Letzipark (*Shopping Center*) while she was using her smartphone and seemed visibly bored. She explained that she was using Google Translate to write back to a friend from Kenya and was waiting for a dinner date. To pass the time, she automatically reached for Whatsapp and Youtube on her smartphone.

Persona 3

- was an elderly gentleman we talked to in Letzipark (*Shopping Center*) while he was reading a book and was not using his smartphone. We felt this was so out of the ordinary that we approached him about it. He told us that in the past he just allowed boredom and had more conversations and social interactions. At his age, he doesn't feel boredom because he has many memories to keep him busy. He also said that he is incredibly curious and assumes that unlike most people who look at their smartphones, his curiosity is fostered by observation rather than a mobile device.

Persona 4

- was an elderly gentleman in Letzipark (*Shopping Center*), engrossed in his cell phone looking for a car for a customer. He was aware of the issue around smartphone use and also likes sometimes to look out of the window on public transport.

Persona 5

- was a middle-aged gentleman we approached at the escalator

in Letzipark (*Shopping Center*). When he entered the escalator, he immediately pulled out his mobile phone. When asked, he told us that he had taken the smartphone out of his pocket because it had been vibrating. He was aware of the issue of smartphone use and felt that looking at the phone beforehand was awkward and unintentional. Mainly, he would use the cell phone for messaging.

The results of these interviews show different attitudes and behaviors in dealing with digital media and smartphones. While Persona 1 consciously deleted his Instagram account and enjoyed the silence in the streetcar, the other persons performed different activities on their smartphones to pass the time or to be entertained. Persona 3 emphasized that he used to have more social interactions, while Persona 4 and 5 were quite aware of the issue of smartphone use and in some cases even felt the need for action in their own behavior.

Early Exploration Phase

The «*Early Exploration Phase*» is the first stage in the development of our project. In this phase, we open the horizon around the topic of dealing with digital media to explore a wide range of possible directions and generate ideas. We deliberately consider the complexity of the topic and dive into individual ideas to see connections and identify key issues. Exciting idea approaches are filtered out and serve as the basis for prototyping, where early prototypes are used as research tools to search for more promising approaches. To start this phase, the Crazy 90 method was used, which involves sketching as many ideas as possible in a short time to become more familiar with the topic.

In this phase, the focus lies on open-mindedness for different approaches and creativity. All possible directions are deliberately considered in order to generate a diverse and broad range of ideas. By diving into and iterating on individual ideas, it becomes possible to develop a deep understanding of the topic and make connections visible. This also identifies the main problems to be addressed as the work progresses.

An important step in this phase is ideation clustering, in which ideas are classified into different categories. This allows a structured view and organization of the ideas, from which interesting approaches and patterns can be identified. For example, categories such as community, politics, and focus on tools emerged during the Crazy 90 method, which can be helpful in taking different perspectives and developing new ideas.

After exciting idea approaches have been filtered out, they are taken up again in a later phase and are used as the basis for prototyping. There, these prototypes serve as research tools to gain further insights and explore for additional approaches that could potentially work.

In summary, the «*Early Exploration Phase*» is the first step in the development process of our thesis. By looking openly in different directions, diving into ideas, identifying key problems, and filtering out exciting approaches, the groundwork is laid for the further development of the project.

Figure 4: Idea sketches that were created during the crazy 90 Method



20 Ways of Description:

At the beginning of our project, we first wanted to address the complexity of our topic and explore our intentions. For this purpose, we used the method “20 Ways of Description”, which helped us to define our project more precisely and to become aware of how multi-layered our problem is.

The method itself was simple, but extremely effective. We thought about 20 different ways to describe our thesis project and wrote them on Post-it notes. Then we later sorted these post-its into categories to better organize them and selected the two or three most meaningful statements out of them. The variety of “Ways of Description” we developed was amazing. From finding a balance in the digital space, to reducing exposure to the “hooked” model, to finding solutions to meet the actual intentions, there were a variety of ideas and perspectives that helped us look at our topic from different angles. By using this method, we gained several important insights. First, we became even more aware of the complexity of our topic. It is not just a simple problem with a clear solution, but there are many different aspects and challenges that need to be considered.

In addition, the method also helped us to define our goal and purpose more clearly. By looking at different descriptions, we were able to better identify our priorities and ask ourselves what really was in the foreground and what we wanted to achieve with our project. It helped us to reflect and sharpen our actual intentions and served as a guide for our further steps in the project development. Another positive effect of this method was the identification of more specific topics for our work. Through the variety of descriptions, certain focal points and aspects became clearer, allowing us to focus on specific topics and make our work more precisely targeted.

Overall, the “*20 Ways of Description*” method was a valuable tool in our project development process. It helped us to recognize the complexity of our topic, to take different perspectives and to clarify our intention. It also allowed us to identify more specific issues for our work and to more clearly define our goals. Using the 20 Ways of Description methods, we laid a solid foundation for our further research and analysis.

Early Ideation Phase:

The early ideation phase was another important step in our project development process. Here we looked intensively at different approaches to solutions and thought in different directions to better understand our topic, dealing with digital media, and discover new perspectives. To generate ideas, we used various creativity techniques, such as the Crazy 8 method. In this process, we sketched many ideas within a short period of time to stimulate our creativity and explore a variety of possibilities. We

discussed and explained these ideas in meetings, which often led to new ideas and suggestions for improvement.

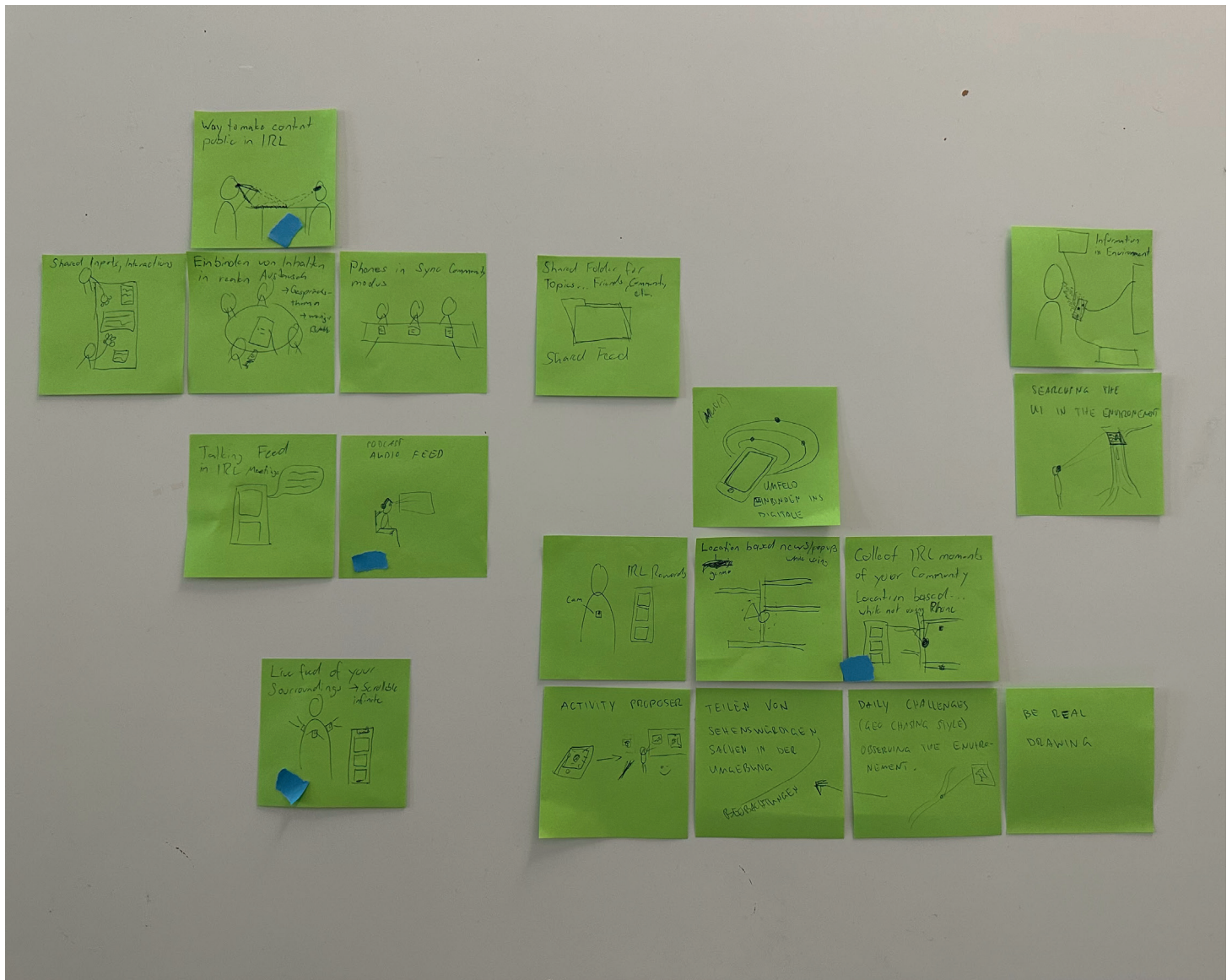
Afterwards, we selected the most promising ideas with the greatest potential. In doing so, we made a conscious decision to develop prototypes that would serve as the basis for research rather than being concrete products. These research prototypes were intended to help us further solidify and refine the ideas.

The ideas we developed during the Early Ideation phase were diverse. Some ideas focused on pure visualizations that would provide a sense of what it's like to be in a flow state, and how easily that state can be interrupted by brief distractions like glancing at a smartphone.

Other ideas were based on thinking about what activities or movements one could perform in order to experience enough sensations and therefore not feel the need to use the smartphone, such as going for a walk in nature. There have been more speculative ideas as well, such as a scrollable live feed of the environment generated from live cameras on the user's body that can be experienced on their smartphone. This live feed was meant to illustrate the absurdity of scrolling endlessly on social media while missing out on many exciting impressions happening around one.

We found some of the ideas particularly valuable and decided to actually implement them in a later step. These included the Audio Feed, Collected Moments, Library Experience, and the Social-Social Media Table. These ideas were further developed and specified in later phases of our project development process. Overall, the Early Ideation phase was an important step in generating a broad range of ideas and broadening our perspectives. It helped us identify and select potential solutions that we could further develop and implement in later phases.

Figure 5: Quick Sketches of Ideas created during a Crazy 8 session



Research Prototypes

In the Early Exploration phase, we created several prototypes to get a precise overview of the area where to focus our project. These prototypes were developed as research tools to test and evaluate different concepts. Below we will go into more detail about the four prototypes we created.

The first prototype is designed to collect moments from the community's real environment and give them the opportunity to enjoy these moments without a smartphone. Participants were asked to consciously perceive their surroundings and photograph interesting, impressive or relaxing things and send them to us including their location. Ideally, the observations should take place in the city of Zurich and should be relevant for other participants. The second prototype is based on the concept of a shared library experience, but remotely. Here, a luminous object was used to connect two people, based on their concentration or distraction. Similar to shared learning in the library, the participants should cooperate even if they are working on different tasks to foster a sense of connectedness and reduce the use of smartphones and other distractions. The third prototype focuses on transforming the visual feed of social media into an auditory experience while maintaining the perception of the real environment. Here, artificial intelligence was used to leverage image recognition and transform the visual social media feed into an auditory delight. This allowed users to visually perceive their surroundings without being focused on their smartphones. With the fourth prototype, we explored how to break the isolated tunnel vision that occurs during smartphone use by projecting the screen content onto a table, and thereby making it accessible to others. This creates a platform for information sharing and encourages users to more accurately evaluate the content they consume, as it can now be seen by others. This approach makes it possible to share individual views of content and thereby reduces the focus on the smartphone. In the following chapter, we will go into more detail about these four prototypes and examine their potentials as well as challenges in the context of our bachelor thesis in order to find out which concept is most promising and will determine the focus of our work.

Collected Moments:

In our modern society, the use of smartphones has become ubiquitous. Many people spend a large part of their time looking at their screens instead of consciously perceiving their surroundings. This can lead to a decrease in experiencing real moments and a decrease in social interaction. In response, we developed a prototype called "Collected Moments" as part of our bachelor's thesis to encourage people to be more aware of their surroundings and collect moments from their real lives without having to constantly look at their smartphones. In the following chapter, we explain how the prototype was built, how the experiment was

conducted, the lessons learned, and the planned next steps in our project development. The prototype aims to encourage people to be more aware of their surroundings and to collect moments from their real lives instead of constantly looking at their smartphones with tunnel vision. To achieve this goal, we developed a prototype called «*Collected Moments*» and conducted an experiment to explore potentials and insights.

Setup:

The prototype was built in several steps. For our experiment, we recruited a group of volunteers who were willing to participate in our prototype. We sent them a one-time request via text message and asked them to capture interesting moments from their surroundings and send them to us, including location information. These included natural beauty such as impressive landscapes, fascinating sunrises and sunsets, picturesque cloud formations or colorful flower arrangements. Cultural or social events were also documented, such as street performers, musical performances, local festivals or lively markets. The participants also recorded notable architectural highlights such as imposing buildings, monuments or bridges. Animal observations were also represented, including fascinating birds or other animals in their natural environment. Curious or unexpected events were also submitted, such as unusual weather phenomena or funny everyday situations. Last but not least, personal moments were also captured that provided insights into the participants' daily lives, such as activities with their families, hobbies or personal achievements. The variety of moments sent in illustrated the wide range of interesting observations and experiences documented in the volunteers' environment.

Insights:

By analyzing the collected data, we were able to gain interesting insights. On the one hand, it became clear that the subjects were more aware of their surroundings as a result of the prompt and captured moments that they might otherwise have overlooked. Second, it became apparent that the location information allowed us to gain a better understanding of the spatial distribution and frequency of the moments collected.

Iteration:

Based on these promising results, we see the potential for further iterations of the prototype. A possible next step is to develop a mobile application that allows participants to save and share their collected moments with other users. Combined with location information, this application could alert participants to interesting moments near them in real time without having to look at their smartphones.

As a result, the goal emerges in enhancing reality with the support of a community by drawing attention to interesting moments that are often overlooked due to tunnel vision on the smartphone. In this way, a walk through the city or the forest suddenly becomes a worthwhile alternative to mindless scrolling through social media, offering at least as much to discover.

Library Experience:

The Library Experience prototype was created as a result of the phenomenon of compulsive phone checking and how this habit distracts us on a daily basis in situations where concentration is required. As the name suggests, Compulsive Phone Checking is a condition in which a person constantly looks at their smartphone, even if they have not received any new messages. This constant impulse to glance at the smartphone can interfere with the ability to fully focus on a task. Compulsive phone checking does not have a single cause, but rather is an interaction of several complementary factors. First, there are the habits and routines of smartphone use that we have built up over years. On the other hand, there is the release of dopamine, which is triggered by the mere thought of receiving a message, as well as the social attachment and the anxiety about missing something, the so-called Fear of missing out (*FOMO*).

As a student, you need your concentration mainly in connection with school work, which, among other things, can be done best in a library, a place of rest, learning and concentration. It is also a preferred place to study independently, but at the same time together with friends. For some, it can be very helpful to experience the learning ambience in community, taking breaks together and knowing that everyone else is also focused. With the "Library Experience" prototype, we wanted to simulate the learning ambience that a library provides, independent of the location, thereby encouraging concentration. In particular, we wanted to investigate the extent to which the learning behavior and smartphone use of two learning participants changes when transparency of their behavior is created. We investigated whether this creates mutual accountability and if this accountability can minimize smartphone use.

Setup:

To run our prototype, we asked two volunteers who agreed to perform an independent activity in two different rooms over a period of four hours, during which they had to concentrate. In our case, these were two female students at the age of 25 who had to study for their studies. To connect the two students, over a distance, and allow them to recognize each other's behaviors and behavioral states, we used one smart-home bedside lamp per person, which could be controlled externally via WLAN with

a companion app. The lamp indicated a total of three states: The first condition was the concentration state, in which the lamp glowed white or bluish. (*Figure 7*) So when the lamp glowed white or bluish, the subject knew that his learning partner was concentrating. The second condition was the distractedness state, which was indicated by a reddish glow from the lamp. (*Figure 8*) This state occurred when the person in the room was distracted by their smartphone or simply distracted by anything. The distraction was then indicated to the learning partner. The third condition was the pause state, which was triggered when one of the participants held her hand over the lamp to request a break. (*Figure 9*) The lamp in this state lit up green. The learning partner could agree to this by holding her hand over the lamp as well, causing the lamp of the requesting person to turn green as well. These three states served the subjects for communication and reflected the respective behavioral state.

In order to be able to see and assess the behavior of the test participants at all and to manually control the signals of the lamps for the respective condition, the test participants were monitored via an iPad using Zoom for the entire four hours. (*Figure 6*) Of course, they were informed about this. The monitoring allowed us to see if the person in the room was distracted or if the person requested a break.

Insights:

After the experiment, we conducted a qualitative interview with both participants to gain a general insight into their user experience. We wanted to know how their ability to concentrate behaved during the four hours and whether the connection established via the lamps even enhanced concentration. In addition, we were interested in the extent to which transparency towards the learning partner played a role and whether a responsibility towards the other emerged.

In the qualitative interviews we basically received very positive feedback. Both test persons were able to work very concentrated and efficiently during the four hours. In both interviews, however, we were able to determine that concentration was strongly influenced by factors other than our prototype. Both test persons mentioned surveillance as the main reason why they were able to concentrate so well. During the four hours they were also in a quiet, sterile and unfamiliar room, which reduced the risk of distraction. In the further course of the interview we found out that both subjects had different learning pressures, which negatively influenced the joint concentration, since it was more important for one of the participants to get ahead and accordingly it was more important not to be distracted. In addition, the interaction with the lamp and the light indication was not clear enough.

The pause feature was very well received by both participants. They commented that the prototype would probably have been very helpful in times of Corona and could have made a difference to their ability to concentrate. In general, it can be said that the «*Library Experience*» has potential, but still needs many iterations and user tests to create a solid product that makes an effective difference. One of the biggest challenges in conducting the experiment was measuring the concentration of the test volunteers. Only reaching for the smartphone could be interpreted as a clear sign of «*lack of concentration*». One participant stated that she used WhatsApp in the web browser several times during the 4 hours, although it was not possible for us to detect this in this setting.

Iteration:

In a further iteration of the prototype, it would be very important to conduct the experiment in an environment that is familiar to the test subjects and not to create a learning environment that is very supportive for concentration from the outset. Furthermore, in the following iterations, the feeling of being watched must be minimized as much as possible, so that the participants do not feel monitored and this factor does not interfere with the experiment. Furthermore, it is important that the participants have a similar learning level, so that the learning pressure is the same for both of them.

One of the key questions that is imperative to reconsider for further iterations of the prototype is how we can accurately measure concentration with our technical capabilities to subsequently more accurately detect and reflect behaviors. However, it is clear that our prototype and further iterations of it will need to be tested more extensively to ensure high quality results and to give us a full picture of the potential of the idea.

Figure 6: Screenshot via Zoom, taken of the participants during the experiment.





Figure 7: First Condition - Concentration State.



Figure 8: Second Condition - Distractedness State.



Figure 9: Third Condition - Pause State.

Audio Feed:

Smartphones are omnipresent these days and with them a behavior of users that can be observed everywhere: In public transport, on the streets, while waiting, while eating and even while walking. Everywhere people are immersed in their devices and devote their attention with an immersive tunnel vision, exclusively to their smartphone. However, this is particularly observable on public transportation. On the way from A to B, it seems that space is only seen as time. Time in which one operates almost continuously in the digital parallel world and escapes into the comfort of the social networks. The social media platforms, such as Snapchat, TikTok and Instagram, consist mainly of fast image and video content and therefore primarily occupy our visual sense. Completely absorbed by our smartphone, we are absent from the real environment in our tunnel vision. Our attention is no longer focused on what actually surrounds us:

Fellow human beings, nature, the city. This constant isolation and being absent leads to the fact that many beautiful moments are missed and we do not perceive many visual details and beauties in our surroundings. For this reason, we asked ourselves how the perception of the environment would change if the visual attention of the smartphone was reduced, and thereby the focus and perception on the environment would be strengthened again.

Based on these considerations, the idea of the audio feed was born, with the goal of converting a conventional, purely visual feed of a social media platform into an exciting audio experience, breaking the tunnel vision on the smartphone and strengthening the user's perception of the real world.

Setup:

For the implementation of our prototype we decided to use the well-known social media platform «*Instagram*», because it is the most used social media platform in our environment and fulfills the characteristics of a visual, immersive platform. As a starting point for our prototype, we used Janosch's feed. (*Figure 10*) In the first step, we used an Alt Text AI program to let it describe the images of the feed, so that we subsequently obtained a matching short description for each image in Janosch's feed. (*Figure 11*) However, the descriptions were too short and clunky to create an auditory experience, so we used «*GPT-3*» from Open AI to extend and re-iterate the AI-generated image descriptions.

As a result, the text gained more content and context and took on a narrative form that stimulated the imagination. In a further and final step, we let Murf AI, another AI program, speak the newly iterated texts and then prepared the audio files on a Google Doc folder for listening. So in theory, it would be possible to make an auditory feed experienceable without having to man-

ually describe the images and manually speak, which was very important to us because the Instagram feed is constantly and continuously changing.

Insights:

During the execution of the prototype, we observed a noticeable increase in visual attention to the environment. The fact that the user had to focus on the auditory sense in order to understand what was being narrated limited his multifunctionality, which prevented him from simultaneously operating the smartphone with visual input. Since the smartphone no longer completely engaged the visual sense, the user's visual focus automatically became more directed to their surroundings. Within a very short time, users were already noticing special or particular moments in the environment.

The image description created by the process also added a little twist to the prototype, as the new iterations and the added poetry of AI made it very abstract and therefore did not exactly match what was illustrated. In the context of a real feed with real friends and events, this would stimulate the user's imagination tremendously and make them wonder what exactly that could be that the person posted. As a result, due to this reinterpretation of AI, users might try to give their post an element that is as abstract as possible, so that it is narrated as imaginatively as possible by AI.

The use of AI was crucial for our rapid prototype and provided us with an exciting opportunity to quickly implement the vision of an auditory social media feed in the form of a rapid prototype, to test it, and to make it tangible. In the process, it was very exciting to see how AI analyzes, recognizes and then interprets the images in its own way. However, the most interesting part was working with three different AI tools and combining and uniting them in one project.

With the former experiments of our prototype, we could see that it is possible with an auditory experience to release the visually banished tunnel vision from the smartphone, so that despite an (*auditory*) interaction with a social media platform, the user could focus more on the perception of their surroundings.

Iteration:

In the next steps, we want to test the prototype with a larger group of participants to get a more comprehensive insight into the user experience and to substantiate and evaluate our assumptions. In particular, we want to know how the visual-to-auditory translation feels and if and how it changes the participants' perception of their environment. Ideally, the feed would be personalized and tailored to each individual participant. Unfortunately, however, this is difficult to implement with our current technical capabilities. During the further development of the prototype and the associated

user tests, it is important that the operation of the audio files is embedded in a pleasant user interface and that the test person is able to operate through the «*audio feed*» in a fluid user flow. In addition, the AI voices should be improved, which currently still seem very strange and unpleasant and therefore drastically throttle the experience of narration. The wishful thinking in a final implementation of an audio feed would be that the voices are also adapted to the respective content creator.

Example:
Figure 10: Image from Janosh's Instagram Feed



"a river surrounded by palm trees and tall buildings"

Extended AI image description:

The river winds its way through the city, flanked by towering palm trees. The water reflects the bright lights of the tall buildings that stretch up into the night sky. The hustle and bustle of the city is ever-present, but the river provides a peaceful oasis.

Social-Social-Media Table:

In today's digital world, social media has become an integral part of our daily lives. We spend hours scrolling through social media on our smartphones, watching, sharing and commenting on content. However, this often leads to an isolated tunnel vision where we focus on our own screen and have little interaction with others around us. To break down this isolated tunnel vision and explore the potential of social media as a platform for social interactions, we developed a prototype called «*Social-Social-Media Table*».

Setup:

The Social-Social-Media Table was developed to enable shared access to social media and encourage users to interact with others. The prototype consists of a large table on which users' smartphone content is mirrored using two beamers, making it visible to others around the table. (*Figure 12*) Users can gather around the table and look at the screen together to view and discuss content from social media or other content displayed on the smartphone, which is usually intended be used by a one-person experience. (*Figure 13*) While using the social-social-media table, several results were found that point to interesting potentials.

Insights:

One of the first observations was that users made more deliberate content choices. In contrast to thoughtless social media use on smartphones, users at the social-social-media table took more time to search for interesting and relevant content. In contrast to individual smartphone use, where users often mindlessly scrolled through their feed, they became more aware of what content they were viewing at the social-social-media table. As the screen became visible to the person across from them, content selection became, in part, a shared decision. Users took more time to search for interesting or relevant content and consciously chose content that might be of interest to the other person.

In addition, it was observed that users gave more thought to the content they were viewing. Being able to share and discuss the content with others created an awareness of what type of content might be of interest for discussion or interaction with other users. Users began to actively engage with the content they were viewing and reflected on what they found exciting or worth discussing. This led to increased critical viewing of content and stimulated interesting discussions about various topics. It also led to increased social sharing and encouraged communication and interaction among users. Shared access to social media allowed users to interact with each other, share their opinions, and explain different perspectives.

Another interesting finding was the selection of content with a focus on interaction with the other person. Instead of simply viewing content for themselves, users selected content that they could share or discuss with their counterparts. This led to increased social sharing and fostered communication and interaction among users. Sharing access to social media allowed users to interact with each other, share their opinions, and discuss different perspectives. In addition, interesting discussions emerged about the content being viewed. Users shared their thoughts, opinions, and perspectives on the content they were viewing, and lively discussions ensued.

Iteration:

As part of our project development, we've also been thinking about potential enhancements for the Social Social Media Table. We would like to explore ways to make access to smartphone content at the table even more seamless and improve the user experience. What used to be a painstaking process of assigning where which image should be projected via computers connected to the beamers should happen more smoothly. It would be desirable to be able to walk to the table and share the content with a few clicks.

Another aspect we would like to consider in the next iterations is the ability for multiple people to use the table at the same time. Currently, the social media table allows two users to each share their screen and discuss content. However, in future iterations, we may explore ways to allow even more users to participate in the table at the same time to encourage greater social interaction and discussion.

Another step in the evolution of the prototype is to conduct tests in public spaces. Currently, we have tested the social media table in controlled environments, but we would also like to learn the reactions of people in public spaces such as cafes, libraries, or public transit. This would allow us to observe the behavior and interactions of users in real environments and make possible adjustments to the prototype.

Another interesting approach for future iterations is to conduct long-term tests over several days. This would allow us to observe user behavior over time and see how social media use at the table changes over time. We could also explore the preparation of interesting content for users to see how they prepare to share or discuss content from social media. In addition, we could also change the orientation of the projections on the table. Currently, the screen is oriented so that users sit across from each other, requiring them to view the other person's content rotated 180 degrees. However, in future iterations, we could explore other orientations to further improve social interaction at the table. In summary, in this chapter we have presented our research findings through the development of the social media table and suggested possible improvements for future iterations. We were able to gain important insights through the development of the prototype.

More deliberate selection of content, interaction with others, emergence of discussions about the content, and reflecting on what is seen that would be exciting to share with others are important points to break the isolated tunnel vision during smartphone use and encourage more social interactions.

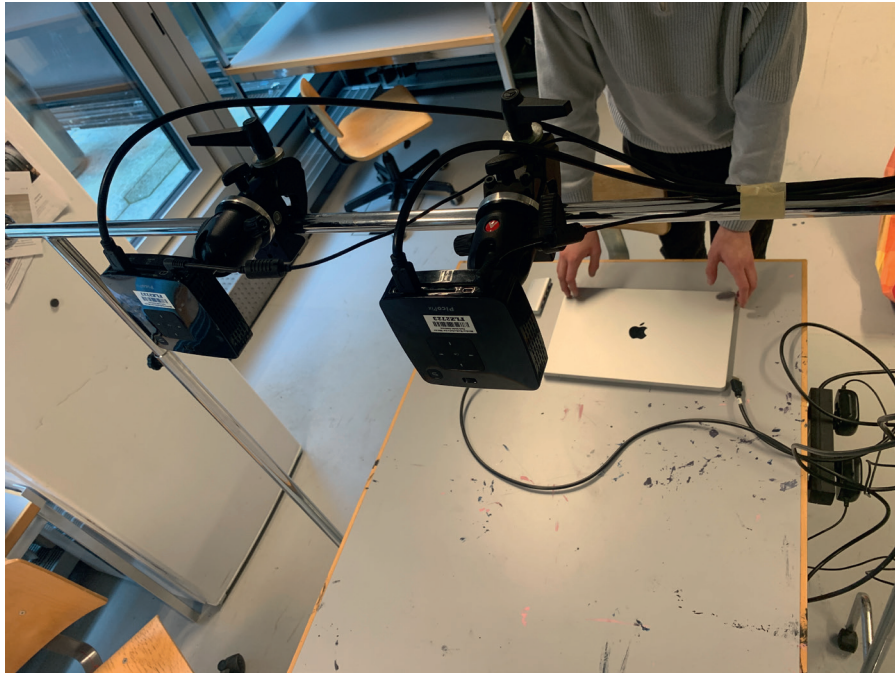


Figure 12: Social-Social-Media-Table Setup

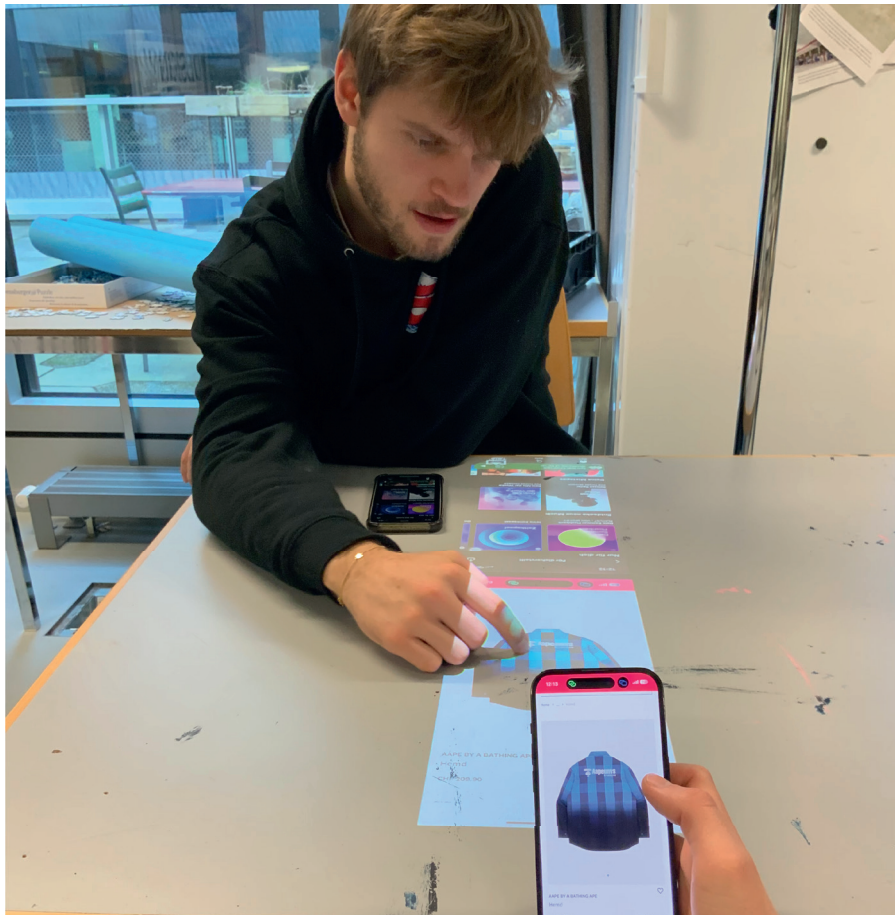
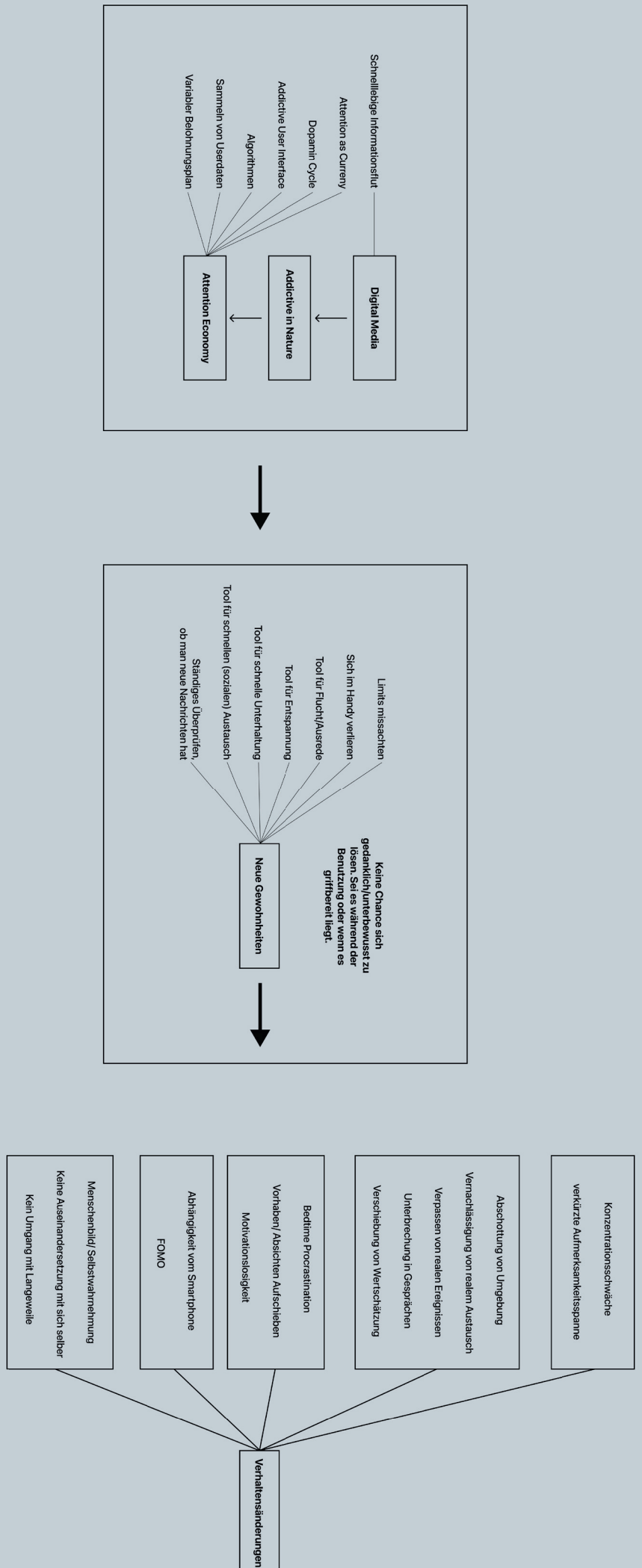


Figure 13: Sharing and Discussing Content on the Social-Social-Media-Table

Understanding the Bigger Picture

In order to understand the overall problem that we want to address with our concept, we have divided it into three subsections. First, we look at the trigger, which is the starting point for the entire change process. We then look at the newly established habits that users have developed when using their smartphones. And finally, we have a look at the resulting behavioral changes, which have an effective influence on everyday life.

Figure 14: Screenshot in Miro, showing the Visualization of the Breakdown of the Problem



Trigger:

The causes of problems in dealing with digital media and smartphone use can be traced back to various triggers. One of these triggers is the fast-moving information overload to which we are exposed in our modern society. The constant availability of information and the abundance of content we encounter on digital platforms leaves us in a state of constant sensory overload. In addition, our attention is seen as currency, leading to a competition for our attention as well as content being designed to be as captivating and addictive as possible.

This «*dopamine cycle*», in which we are constantly seeking rewards and affirmations, reinforces addiction to digital media and smartphones. Another trigger for digital media problems is the addictive design of user interfaces. Many apps and websites are intentionally designed to be addictive and entice users to spend more time with them than intended. This «*addictive interface design*» aims to hold our attention and keep us coming back for more. In addition, algorithms and companies are constantly collecting data regarding our usage behavior in order to provide personalized content and advertising, which further increases our dependence on digital media.

New Habits:

The consequences of these triggers are new habits that users develop in their use of digital media and smartphones. These include disregarding self-imposed limits, getting lost in the use of the smartphone, using the smartphone as a tool for escape or excuse, for relaxation, for quick entertainment or for quick social exchange. In addition, users often feel the need to constantly check for new messages or notifications, leading to a constant state of distraction and restlessness. A key problem that arises from these new habits is the lack of opportunity to mentally or subconsciously detach from smartphone use. Whether during active use or when the smartphone is within reach. This leads to a constant presence of digital media in our lives and affects our behavior, our concentration and our social interactions. Another habit is that of getting lost in the use of the smartphone.

Users can easily lose themselves in the endless news feeds and in social media for hours without realizing how much time has passed. This leads to an increased urge for constant distraction and impaired time management. The smartphone is also often used as an escape or excuse tool. In stressful or uncomfortable situations, many people reflexively reach for their smartphone to distract themselves or escape unpleasant feelings or social interactions. This can lead to a problematic behavior pattern in which the smartphone is being used as a proven means of coping with everyday stress or problems. In addition, the smartphone is often used as a tool for quick entertainment.

The availability of diverse entertainment content, such as videos, games and social media, allows users to enjoy themselves anytime and anywhere. This often leads to excessive consumption of entertainment content, which can lead people to neglect other activities. A further problem is the constant checking for new messages or notifications. Many users feel the urge to constantly check their smartphone to stay up to date and not miss any messages. This leads to a constant state of distraction and restlessness that can affect concentration and productivity.

Behavioral Changes:

These new habits have a negative impact on our behavior and quality of life. They can lead to excessive use of digital media and smartphones that interfere with other important activities, such as social interactions, physical activity, sleep and concentration. In addition, excessive smartphone use can lead to mental and physical health problems, such as sleep disorders, eye strain, postural problems, and addictive behaviors. Furthermore, excessive smartphone use can have an impact on various aspects of daily life and may lead to drastic behavioral changes ^[4].

A lack of concentration and a shortened attention span can be a negative consequence of excessive smartphone use. The constant distraction of notifications, social media, or other apps can make it difficult to focus on a task or conversation. This can affect productivity and lead to decreased performance ^[15]. Disconnection from the environment and neglecting real-world interactions are other behavioral changes that can result from smartphone use. When users are constantly absorbed in their smartphone, they tend to neglect paying attention to their surroundings. This can lead to missing real-world events, interruption in conversations, or a shift in appreciation toward real-world relationships ^[57]. Procrastination is another phenomenon that can occur. Constantly scrolling through social media or playing mini-games can cause users to neglect their bedtime, for example, and become unmotivated about accomplishing other tasks ^[58].

Smartphone dependency and Fear of Missing Out (*FOMO*) can also lead to behavioral changes. When users are constantly dependent on their smartphone to stay in touch with others or access information, it can lead to emotional dependency. Constantly checking notifications and the fear of missing something can lead to increased stress levels and affect the mental health ^[1]. A distorted human image and a diminished self-perception can also result from excessive use of smartphones. Through filters and staging in social media, users can develop unrealistic ideas about other people and their lives.

This can lead to low self-esteem, comparison with others, and a constant need for validation. At the same time, excessive smartphone use can cause users to have less time to reflect on themselves

and their own thoughts, as the attention is constantly focused on the smartphone instead ^[2]. Another aspect is dealing with boredom. The smartphone offers a variety of distractions and entertainment options, so that users often feel the need to spend every free minute with the smartphone. Boredom, which used to be an opportunity to stimulate creativity or come to rest, is often avoided by reaching for the smartphone. This can lead to an inability to cope with boredom and appreciate moments of silence ^[1].

Findings

Our brain forms habits to build a shortcut to save energy, which allows us to stay focused longer. Over the long-term use of the persuasive smartphone user interface which delivers quick successes to the user's needs, the habit formation is encouraged and strengthened all the more. The added social pressure for direct responses and pervasive accessibility has also contributed to the routine behaviors of users ^[1]. Through close observation over a long period of time, we have discovered exactly where the problem lies in smartphone use and why so many people are dissatisfied and frustrated by their usage. Most crucially, smartphone users form routines and habits over time that have a major impact on their conscious use, pursuit of actual intent, and time spent with the device. It should be noted that 89% of smartphone interactions are triggered by the user ^[1]. This is contrary to the assumption of many users who see the problem more in the pervasive flood of notifications. Many users even perform a significant portion of interactions subconsciously. Reaching for the smartphone is so natural and anchored that it is often not even noticed anymore.

Another finding is the behavior of users when they pick up their smartphone. It is quite striking how many users simply use the device to play around without even having any specific intention. They swipe back and forth between apps, which often triggers chain reactions. When the user falls into one of his routines, he jumps from app to app just out of habit. The time, which the user usually feels wasted in retrospect, leads to neglecting his actual intention. What is interesting here is that the context in which the interactions take place has very little influence on the interval between interactions. However, it does have a significant impact on how long the interactions last. That implies that looking at the smartphone, regardless of location (*with some exceptions*), always happens with about the same frequency. However, the duration of how long one then uses the smartphone is highly dependent on local conditions.

The most common reasons for compulsive phone checking are «*down time*» - moments of inactivity, with no obvious alternative source of stimulation or demand from the user - and tedious tasks in which users compulsively and continuously check their phones. In addition, users reach out for their phones as a reflex to social embarrassment as well as when they feel an increased urge to check their phones when they anticipate some sort of social or informational reward.

Users also explain that the well-established pattern of habitually checking their phones does not always require a trigger, and they often check their phones for no apparent reason.

The most common reasons users give for ending habitual phone sessions are competing demands. These can be external factors from the real world, or it can be the 30-minute feeling of disgust that many users describe after spending time habitually checking their phone [1]. Users also regularly end sessions because they find they are viewing content they have already seen.

The reasons for picking up the smartphone are versatile. In addition to the intention of using the smartphone as a practical tool, it is also often used as an escape from unpleasant situations. It is perceived as a brief period of time out, although in the long term can be considered to be rather stress-inducing. Every moment of «*down time*» is supplemented or even replaced by smartphone interactions. For example, it is common to spend time using the smartphone right after getting up or before going to bed. Most people are aware that this brings negative consequences, but perform it anyway because it gives them a relaxing feeling. They don't want to miss anything, still want to answer the last messages, and social media apps draw them into the thrill of an endless loop.

Therapy Methods

As part of our research on behavioral addiction and change, we conducted interviews, encountered various psychological methods, and gained insight into related work in the area of behavior change and routine shaping. During the research, we were looking for the best method that could be applied to our concept and integrated into a mobile user interface. For our topic and for our intent, we finally decided to integrate the Cognitive-Behavioral Therapy as a basic structure in our BA and to follow its approach up to a certain point. Cognitive Behavioral Therapy (*CBT*) is a scientifically based method of psychotherapeutic treatment whose approach provides an optimal basis for our approach. It attempts to influence undesirable thoughts, feelings and behaviors by changing the patient's way of thinking and improving the patient's own coping strategies. To do this, CBT follows a summary of four main phases: The first stage involves the patient identifying and recognizing the undesirable behavior. In addition, phase 1 consists of developing a clear treatment plan. The next step is about the patient analyzing and understanding his or her behavior. Phase three is about adjusting and changing the behavior. To conclude, in the last phase, the progress is evaluated and optimized if necessary ^[59].

Out of the principles of the CBT, we finally developed three main topics: Awareness, visualization of one's own behavior and the subsequent shaping of the desired behavior, which we will discuss individually in the following section.

Creating Awareness:

In general, our target group has already a certain awareness of the problems of compulsive smartphone use. Nevertheless, it is important to us to provide the user with a certain amount of education through our Bachelor project. We want to show the user how routines develop over a period of time without consciously choosing to do so.

In addition, we want to show him that the formation of routines and habits is encouraged by certain apps and by the Attention Economy. Furthermore, we want to show the user what negative effects these habits bring along and to what extent this problem has become established and anchored in society.

Visualization of the Behavior:

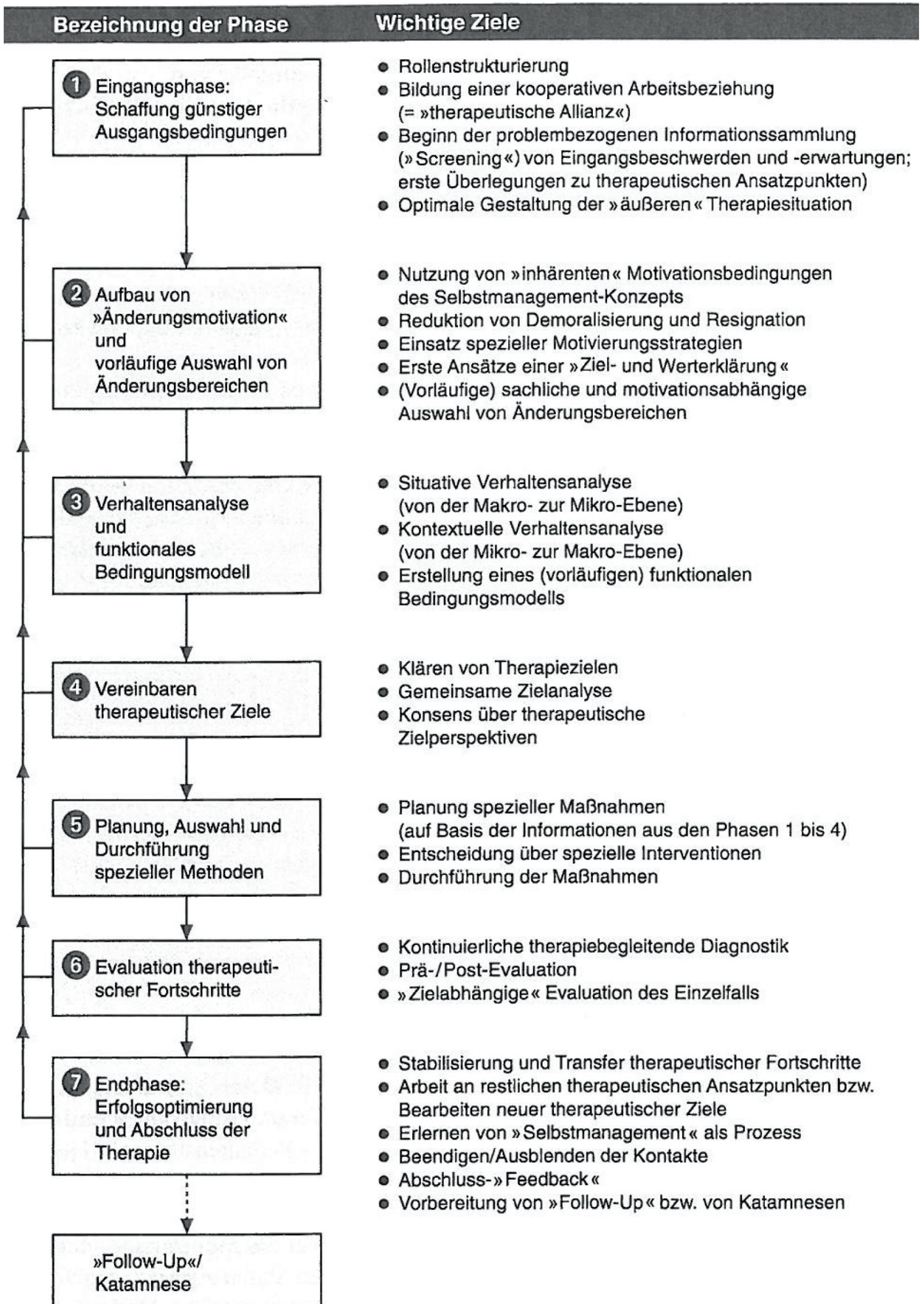
Visualizing one's own behavior is an essential part of our BA project. Here we try to graphically represent the user's behavior based on the recording of his smartphone usage over a period of time, thus providing the user with a better understanding of his routines and behaviors. Furthermore, the graphical representation should also play a role during usage and reflect the user's behavior. Furthermore, we want to show the user any impulsive misbehavior, such as reaching for the smartphone without intention and its automatism behind it. Another point to clarify the user's own behavior is the independent evaluation on it. To do so we want to give the user the opportunity to estimate whether the usage felt fulfilling or whether it felt more like a burden and a waste of time. This step is intended to clarify the user's well-being when using the smartphone.

Shaping the Desired Behavior:

This phase should allow the user to interact with his recorded behaviors and restructure them, in order to shape his own desired behavior. We want to enable the user to replace elements of the recorded session with other apps or other digital activities, for example, by moving elements of the session and thereby changing the order of their routines, or by adjusting and adapting elements of the session with limits, automations, or warnings. In order to achieve the targeted intention of use, the user should also be able to consciously decide into which behavior or routine he wants to start.

Through the elaboration of these three described over-themes and the starting point of cognitive behavioral therapy (*CBT*), a concept emerged that aims to help users explore, understand, and change their behavior to achieve a healthier, more satisfying, and more productive smartphone experience. Thus, our four main phases eventually formed: Record and Identify, Adjust and Guide, and Evaluate, which we will look at in more detail in the following chapter.

Figure 15: Accurate Mapping of the Phases of the Cognitive Behavioral Theory [59]



ACTUAL APPLICATION

Journey Map

The Journey Map, which was created during this project, is an important step in the conceptualization and development of the app. The map serves as a guide to visualize and plan the user flow. It consists of individual sections, each of which comprises several steps. In each section, actions and resulting rewards for the user are defined.

The first step of the journey map is the introduction, which starts with the download of the companion app by the user. The user then goes through the onboarding process, which highlights the vision of the project and educates and raises awareness about the issues to be addressed. This contains a comprehensive briefing on the issue of subconsciously adopted routines, as well as an insight into the mechanisms used by the industry for this purpose. In the next step, the user is informed about the process and the operation of the app, and is educated about data protection laws. Upon completion of the onboarding process, the user receives a reward.

A further step consists of the phase of recording and identifying the routines. To do this, the user's behavior is first analyzed over a period of time, processed, and then displayed to the user. The user continues to use their smartphone as usual, while the process of capturing the routines takes place in the background. As soon as the recording of the routines is done, the user is informed about the availability of the viewable recordings and the user gets rewarded again. The visualized records now offer the user an insight into their adopted routines. In doing so, the user receives information about noticeable patterns in the use of their smartphone and allows them to identify their own behavior. In a further step, we now offer the user the possibility to adapt the adopted routines according to their wishes. Within these routines, the user can delete or replace elements, set limits, or adjust the order of the elements. In addition, possible and reasonable adjustments are suggested to the user by the system. Once again, the user is rewarded for viewing their recordings and making adjustments to their routines. In a further step, the user is helped to achieve the desired behavior with the smartphone with the help of our guiding user interface. To achieve this, the adjustments made by the user are continuously displayed in the user interface and the functions required for this are provided. From the moment the user picks up their smartphone and defines their intent, they are accompanied by our user interface until they reach their intent, keeping it in focus at all times. While finalizing such a session, the user is offered the possibility to rate it and, in case of dissatisfaction, to adjust it again. In addition, the user receives a weekly review to check their progress and set new goals. This process helps to further adapt their routines and improve themselves. Overall, the Journey Map provides a structured way to plan the user flow of how we will effectively guide the user on their journey to change their behavior.

Recording

Setup:

The recording part of the service provides a way for users to visualize and understand their usage habits when dealing with smartphone apps. Through extended use of the smartphone, users develop routines in dealing with apps and the device in general, which are often reinforced through targeted habit-forming design. Often users are not aware of how frequently they use their smartphone or which apps they use. They may open apps that were not intended, or their original intent may fade into the background as they use their smartphone. Users may lose sight of their intent during use and stay on the smartphone longer than intended, which can have a negative impact on everyday life. Many users find their own usage behavior disruptive and want to change it, but often have no accessible ways to address this behavior.

To help users, the recording part of the concept provides an overview of the routines that have been acquired over the years. The recording system runs continuously in the background and records any interactions the user has with the smartphone. These recordings are converted into a graphical timeline on which the user can get an overview of their usage throughout the day. However, the focus of the Recording system is much more on the detailed records of individual interactions.

For each time the user picks up the smartphone, the recording system makes visible how the interaction with the device was structured. It shows which app the user started, when that user switched to other apps, how long the user spent in those apps, and at what point the user was just aimlessly fidgeting around. The graphical representation allows users to clearly see and understand their usage patterns and routines. In addition, the recording offers the system the possibility to automatically recognize recurring patterns. Especially in these repetitive processes, such as the preferred app that the user opens first or which they like to stick to after using other apps, the routines that have been unintentionally trained over the years can be found.

Unlike familiar screen-time features that are common in newer versions of mobile operating systems, the focus of the Recording system is not on the total time of use, but rather on the sequence of using different apps. It shows when the user opens or closes which app and switches back and forth between each. The visual representation on a linear timeline, where individual app-uses are represented by respective bars mapped on it, gives the user insight into their own behaviors that have never been represented before.

Despite the increasing awareness of privacy in modern mobile operating systems and their efforts to give users control over their data, one important aspect often remains unconsidered - the potentially habit-forming effect of apps and products. For this reason, our recording system allows users to become aware of their accepted routines and habits for the first time, providing an opportunity for self-reflection.

Implementation:

The design of the Companion App is intended to allow the user to intuitively and effectively navigate through the recordings, individual pickups, and recognized routines. When starting the app, the user is greeted by an overview of the entire day, in which the individual pickups are displayed at the respective time. (*Figure 16*) It is possible to jump back in time over several days via the timeline to get an overview.

There are two possibilities to get more detailed information about the assumed routines. On the one hand, the user can independently get an overview of their interactions during the individual pickups by clicking on the selected time period in the daily overview, which then enlarges and provides an isolated view of the desired pickup. In this, the individual app usages are then displayed as previously mentioned and the user has the option to quickly switch between the individual pickups by swiping horizontally. (*Figure 17*)

Alternatively, it is possible to get an overview of one's routines by accessing the patterns of routines recognized by the system, which are displayed below the daily overview. By selecting these, the respective parts of the daily overview are marked, where these patterns/sequences can be found. If the user now clicks on one of these pickups, the detailed view of the individual pickup is also displayed here and the user can therefore obtain an overview of their recurring routine.

Our recording system therefore represents an essential first step to become aware of one's routines and to address and adjust them as one would like them to be in the next section. It offers users the empowerment to choose and structure their routines themselves. Through intuitive navigation and detailed data preparation, it allows users to better understand their habits and strive for change to achieve their goals.

Figure 16: Pick up overview of the whole day

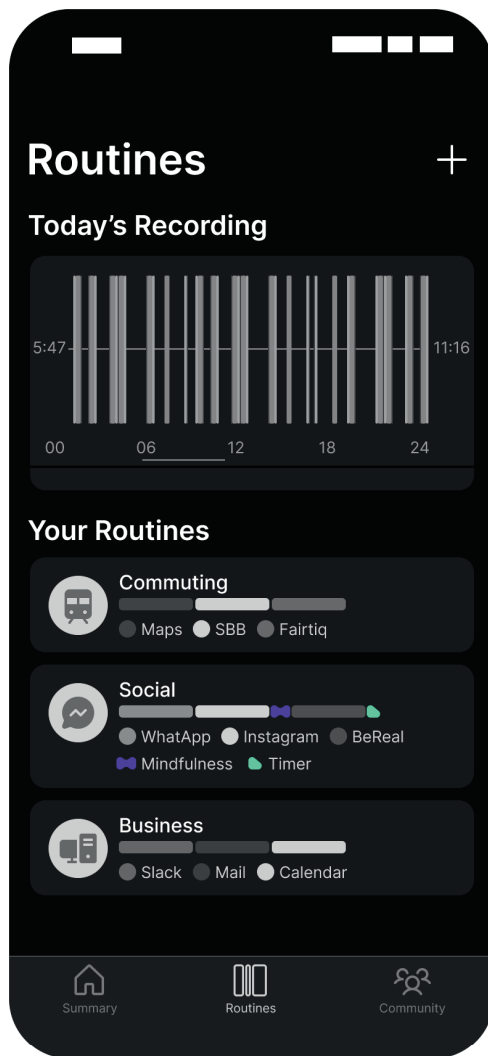
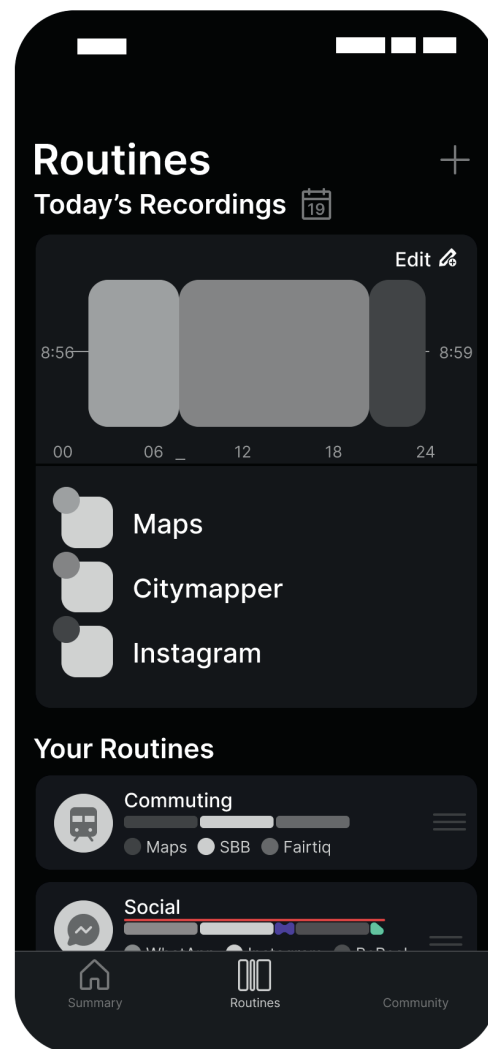


Figure 17: Pick up overview of the whole day

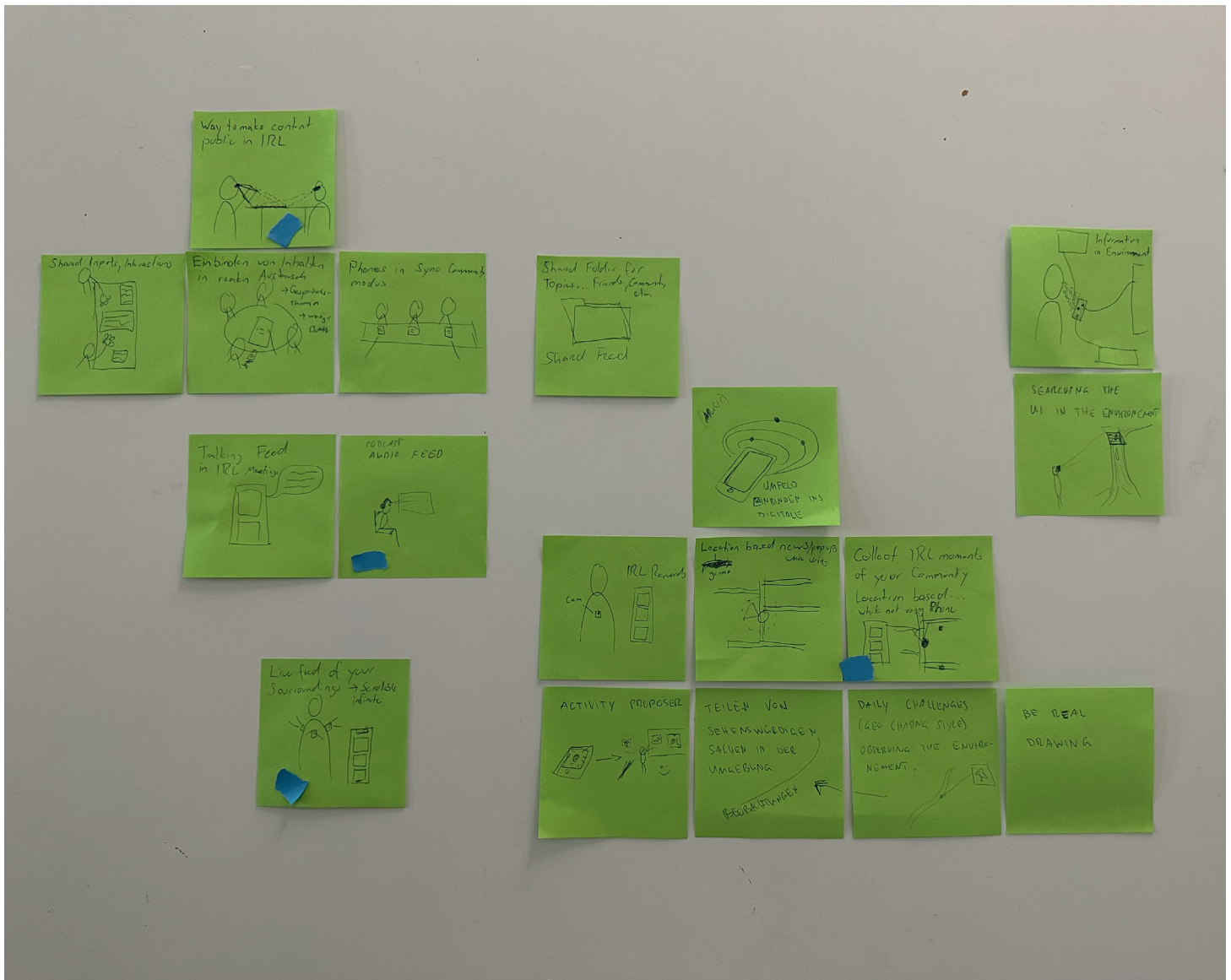


Physical prototype:

As part of our development and to give users a first look at our recording system, we built a physical prototype. This served to show the special features of our system compared to existing screen time systems and the focus on the individual pickups. The prototype consists of a paper roll, which is unrolled by pulling on the end of the paper. As it does so, the paper passes through the coloring part of the prototype, which consists of five different colored pens, each representing a different smartphone interaction. While the user now uses their smartphone, the paper is colored live by the respective pen as they use it. When the user switches between different apps, a chronologically correct recording is created by different colorings of the paper. This recording then serves as a visual representation of the timing of the apps used during each smartphone pickup.

The physical prototype therefore provided an initial visualized rough overview of our recording mechanism and helped users to better understand our system.

Figure 5: Quick Sketches of Ideas created during a Crazy 8 session



Routine Adjustment

Setup:

The second section of our concept consists of the so-called routine adjustment part. This is about empowering the user to design and adjust their routines as they would like them to be.

Smartphone users develop routines in dealing with apps and the smartphone in general over longer periods of use. Often, this routine formation is deliberately reinforced through targeted habit forming design. Our recording system offers the possibility to record these routines and to show the user in a comprehensible way when, how and where they take effect during use. In this way, the recording is the first step in empowering the user about their adopted routines.

The Routine Adjustment Part is the subsequent section to now choose, adjust and design one's adopted routines as desired by the user. Routines consist of several apps that the user likes to use in combination to cope with their intentions.

However, in daily use, it seems difficult to stick to only the apps that are necessary to follow one's conscious intent. It is also difficult to create one's own useful app combination for a particular routine from scratch.

To make this creation of routines as accessible as possible, we include the previously described part of recording. By recording the individual pickups one by one, it is possible for the user to gain a detailed view of the apps used in combination. Furthermore, this view allows the user to have an overview to think about possible useful routines for the respective intentions and purposes. As the pickups will have been made based on different intentions, they will include the appropriate apps for each intention.

Our Routine Adjustment Tool now allows the user to tag these individual pickups with the respective intent, sort the apps contained within, which apps were used intentionally during the pickups and which were used unintentionally. After this sorting, the user has created a routine in the simplest way, with only those apps that they need for following their intent. If an app that also belongs in this routine is missing, it can be easily added. In addition, during the Routine Adjustment and Creation parts, we offer a wide range of interventions that can help the user to use certain apps more consciously or to follow certain time limits. These interventions are described in detail in a later section.

The Routine Adjustment part provides a simple and accessible way to create your own desired routines. You can start from existing, assumed routines from the Recording-Part as well as create completely new routines from scratch. With our Routine Adjustment tool, the user can specifically sort the various pickups recorded in the Recording part and assign them to individual intentions. This sorting allows the user to easily create a customized routine that contains only the required, desired apps. If an app is missing, it can be easily added. This flexibility and ease of use makes creating and customizing routines significantly easier.

Implementation:

The app design follows an intuitive navigation based on the bars known from the recording part. These bars are arranged on a timeline and represent the respective apps to be used in the routine. Interaction with this timeline and its elements is designed similarly to music or video editing tools, but reduced to core functionality for simplicity. All editing takes place directly on the timeline, which makes it easy to define the apps used and their order in the routine, as well as to add interventions. (*Figure 19*) Interventions can be viewed as effects placed on specific segments of the routine, or as transitions between apps. For example, a time-limiting intervention can be placed as an effect on a

particular app, or an intervention that encourages more deliberate interaction with the app can be placed as a transition before the app to be opened. Adding more apps is also straightforward and similar to adding a new clip to existing video footage in video editing tools. *(Figure 20)* After successfully customizing or creating a new routine, it can be named, iconed and saved. *(Figure 21)*

Thanks to the Recording Part, the Routine Adjustment and Creation Part provides an accessible way to adjust existing routines to the user's needs or to create user-defined routines for everyday use. The user therefore has control over their adopted routines and can adjust them as desired. This is another step towards user empowerment. The routines defined by the user form the basis for our Guidance System, which supports the user in effectively following their desired way of using the smartphone.

Figure 19: Sorting the individual elements of a routine

Figure 20: Adding an intervention or additional app

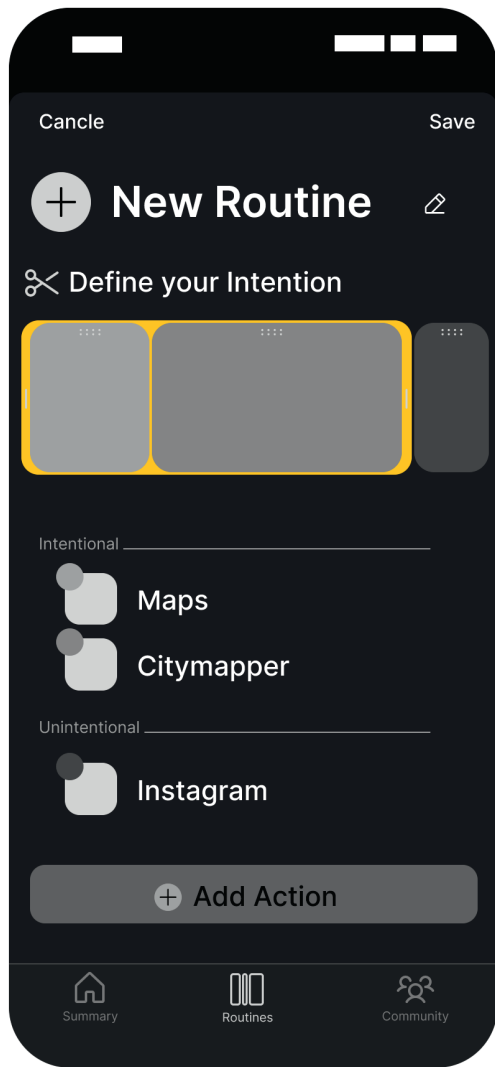
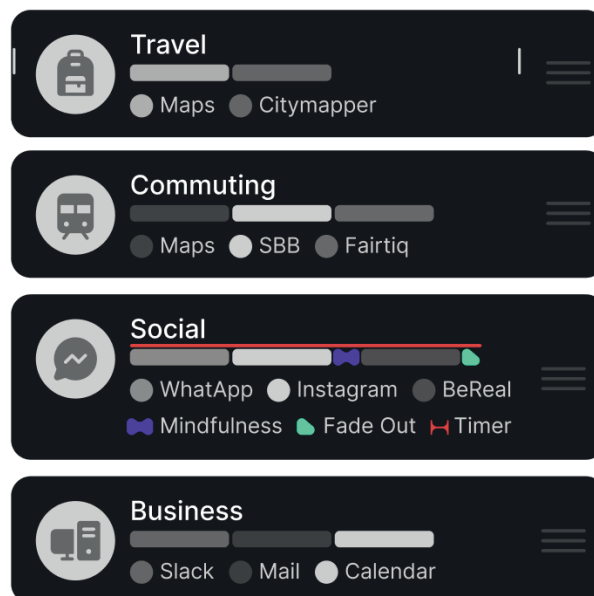


Figure 21: Visualization of the routines created or customized by the user

Your Routines



Guidance

Setup:

The third section of our concept consists of the so-called guidance part. This part is aimed at helping the user to effectively implement their defined routines and thereby be able to follow their actual intentions. This requires some fundamental adjustments to the navigation through the operating system in order to simultaneously limit several interactions that cause dissatisfaction for the user.

In the previous steps of the recording, the user is given the opportunity to get an overview of which routines they have adopted over a long period of time when using their smartphone. In the next step, Routine Adjustment, the user can adjust these routines according to their own preferences or create completely new routines.

Our implementation of the guidance part is designed in such a way that, before unlocking the smartphone, the user must first decide on a specific intention and the appropriate routine for it. Once the user has decided to start one of these routines, only the app bundle defined in this routine is available for the time being and prevents the user from getting lost in unwanted other apps. The navigation concept thereby takes into account a quick switch between the different required apps in order to pursue the actual intention. Should it happen that the user needs an app to fulfill the intention, which was not previously defined in the routine they are currently in, it is still possible to open this app, which is then available to the user as an additional app in the routine during the current session.

By doing this, we allow the user to use their smartphone in a more focused, efficient, and fulfilling way to pursue their intent without restricting them. After completing the intention, we give the user the opportunity to reflect on it when closing the session and rate it if needed. These evaluations can serve as a starting point for optimizations of the routines.

Implementation:

During the development and integration of the guidance part into the operating system, we focused strongly on the basic navigation. We decided to elegantly integrate the guidance element into the existing structure of mobile operating systems. For this purpose, we have further developed the home indicator bar, which already functions as a navigation element, and now call it the routine indicator bar. (*Figure 22*)

The routine indicator bar serves as a visualization while following a routine. (*Figure 23*) It also provides the ability to quickly switch between apps that are part of the current routine by press and hold and swiping horizontally. (*Figure 24*)

Quickly switching between apps is especially important because it can be difficult to arrange the apps in the right order while creating or customizing a routine. Using familiar swipe motions, such as swiping up and holding, the routine indicator takes you to a more detailed overview of the current session and the ability to quickly add another app that is not in the current routine using a search function. (Figure 25) Swiping up and releasing the bar ends the current session.

The routine indicator bar can be considered as the «home» of the routines. The user has the option to display selected routines permanently on the lockscreen or to show or hide them depending on various factors, such as time and location. Once the user wants to start a particular routine, they can simply drag the routine indicator up to the desired routine that is appropriate for achieving the current intent. The bar then wraps around the apps included in the routine and visualizes them at the bottom of the display while in use. This allows the user to quickly and easily access the apps in the routine and accomplish their intentions. While selecting a routine on the lockscreen, swiping horizontally can launch a specific app included in the routine. (Figure 26)

By selecting the desired routine alone, the user launches into the first app defined in the routine. When the session ends and the desired goal is accomplished, the bar wraps around the entire routine and transports it back to the lockscreen. In the process, the individual routines can be viewed and closed as a complete package.

When designing the guidance element, we took care to integrate it elegantly into the existing system without being perceived as a disruptive factor. Although the system does not appear as open as usual, the new options for quickly switching between apps makes using the smartphone more efficient and faster than before. At the same time, apart from the interventions that are self-defined in the routines, the system does not impose any restrictions on the user, but guides them toward achieving their goal.

Figure 22: Visualization of the Home Indicator Bar we have renamed to Routine Indicator Bar

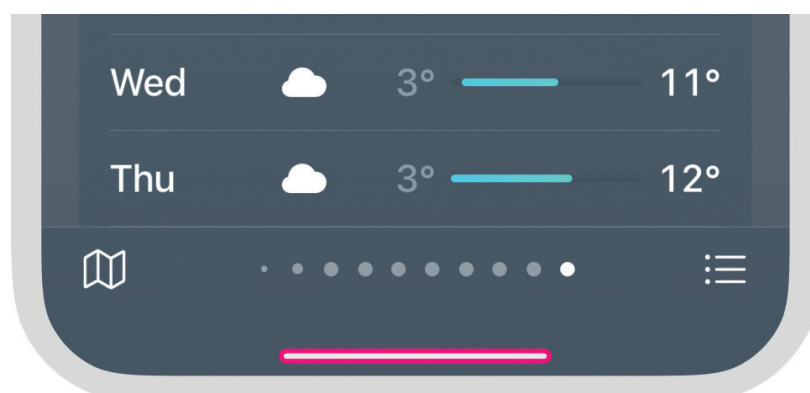


Figure 23: Visualization of the Routine Indicator Bar while following a routine



Figure 24: Visualization of the quick app switching mechanism



Figure 25: Visualization of the mechanism to add an additional app to the session



Figure 26: Visualization of how to start into a defined routine on the lockscreen



Interventions

Setup:

The Interventions part in our service is an essential part of the Routine Adjustment part. The interventions serve as a tool to better follow the defined routines and intentions of the user. While our Guidance System can avoid many unwanted interactions during the smartphone session, additional steps may still be required to get the user to follow their actual intentions. In many cases, certain routines are so internalized over the years that they have become deeply embedded and require special interventions for specific apps. Our system offers a selection of different interventions to cover as many cases as possible. These can be freely placed by the user during the Routine Adjustments Part. In addition, our approach offers the possibility to provide suggestions for interventions when certain adopted routines are detected. The selection of interventions is not limited to the current one, but can be extended in the future with additional interventions that might be more effective. A common use case for interventions is setting time limits on individual apps, a category of apps, or limits over a longer period of time. Here, the user can be warned when the limit is reached, or restrictions or friction can be built in during use. Interventions can also be used to combat compulsivity by leading the user to be more mindful while opening the app and asking themselves if their actions are in line with their intent. It is important to note that any use of constraint or friction through interventions is determined by the user. Our approach is designed to focus on achieving the actual intention, resulting in a fulfilling user experience. However, interventions can be a reasonable part of the user flow to achieve this fulfilling experience in the long run.

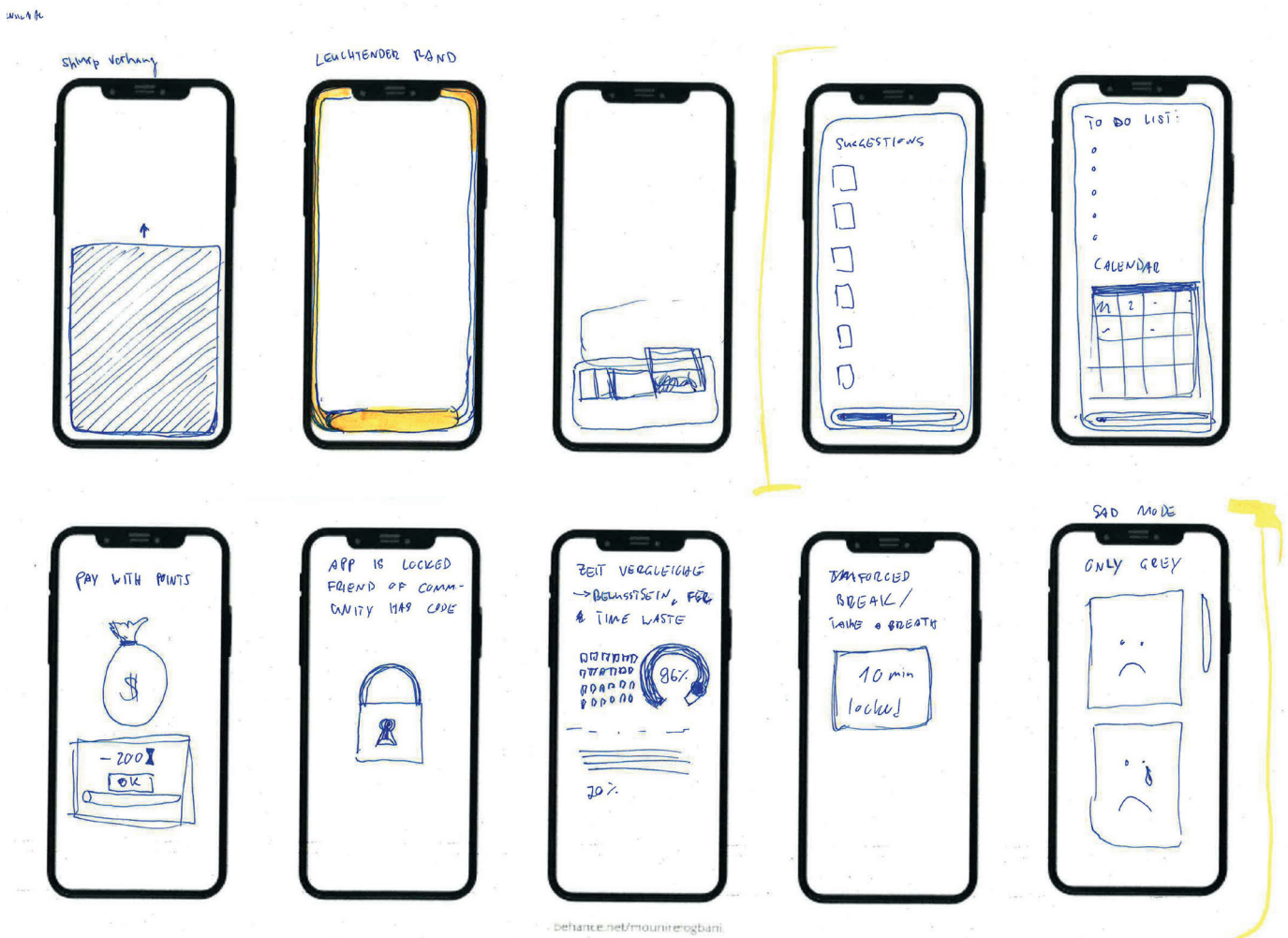
Implementation:

Similar to the guidance part, which takes care of the navigation, the routine indicator also contains the interventions. The type of interventions can be chosen freely. Mostly, however, these are based on the routine indicator and refer to the apps contained in the routine. (*Figure 28*) Examples of possible interventions range from color filters to opening the front camera to look yourself in the eye while exceeding the actual intent. Call-to-action interventions, where you have to consciously decide against an activity that is probably more meaningful, are also conceivable. We see a simple extension opportunity to add new interventions proven to be effective to the collection of possible interventions in future next steps. Furthermore, it can be assumed that the effectiveness of the respective interventions has to be classified very individually depending on the user. For one person the one approach works, for others rather the other one.

In a following section, we will also discuss how incorporating the community and real-life circumstances could be included to make the interventions even more effective.

Basically, our system, in combination of the three main parts, Recording, Routine Adjustment, and the Guidance part, provides an accessible, easy-to-use structure for users to identify where interventions might be needed. It provides an intuitive way to select and place the appropriate intervention, as well as a suitable integration during use, where the interventions are then effectively executed. This guides the user to their desired, fulfilling smartphone behavior in the long term.

Figure 27: Application of the Crazy 8 Method in Relation to Interventions



Community

Setup:

Our concept provides the community part as the last step to achieve a satisfying and self-determined handling of the smartphone. It is common knowledge that many people are dissatisfied with their behavior when using smartphones. This not only affects their personal circumstances, but also their social behavior.

The effects range from phubbing to affecting the ability to concentrate in conversations and have a significant impact on social interactions and relationships. Although some people have a healthier relationship with their device than others, in many cases there is a desire for a more balanced smartphone behavior. However, this endeavor is highly challenging for many users, as social dependence on smartphones is pervasive and, for some users, exacerbated by FOMO.

In our concept, we see problematic smartphone behavior as a shared task that we want to tackle as a community. With our community feature, we want to create an accessible way to work together on this goal. Users can form different groups where they can support each other and improve their behavior.

Figure 28: Visualization of possible interventions during use



In doing so, the community part provides support in overcoming the initial hurdles, strengthens motivation through the competitive approach as well as sharing effective routines, adjustments and interventions. The focus is on collaboration and cohesion as essential factors in achieving the goals set. In addition, the community part follows persuasive strategies from behavioral psychology and provides our service with the basis for more effective interventions based on data from the group. By analyzing and translating information into exciting facts during interventions and allowing other users to be involved in the intervention, the desired changes in users' behavior can be achieved more quickly and effectively. The community part is therefore an important component of our service concept, enabling users to improve their smartphone behavior and build a healthier relationship with their device.

Implementation:

Like the Guiding Part, the Community Part is built throughout the entire system. However, the Community Part is considered optional and does not have to be used to take advantage of the other benefits of the system.

The Community Part is integrated in such a way that it gives the user a playful overview of their progress, which is represented in the form of trophies that are obtained by achieving goals. It also provides the user with an overview of their progress in following their self-defined desired routines, thus showing their progress in their own smartphone behavior.

If the user wants to make their experience more exciting and share their progress to be motivated by their environment, they can connect with other users through the community part to challenge themselves there or just exchange ideas. For this purpose, the user creates a group to which the other desired users are added. In this group, the user receives activities from other users that have proven effective and what progress they are making. Furthermore, teams can take on challenges to earn trophies. In doing so, you collectively work together and fight for your team in order to bring them forward through your own behavior and thereby not let them down. At the same time, small successes are valued through the team experience and can be reinforced by the other users.

Through the shared team experience, new opportunities arise to involve other users. For example, interventions can be initiated that connect two users who are in a similar situation and thereby offer more meaningful engagement. Also, comparisons and facts can be drawn from community data that can have a greater impact on one's own behavior. Furthermore, interventions can arise that require the consent of other people in the team in order to be allowed to exceed the limits defined by the user. Also, interventions could occur that, if disregarded, would have an impact on the entire team, either in the form of reaching trophies or by having a noticeable impact on the behavior of other users' interventions.

As a whole, the collaborative part of our concept is the final part that completes the overall package. It adds an extra layer of gamification to the system and therefore an emerging responsibility for the team to be there and help out. At the same time, it serves as a starting point to tackle problems together and provides a platform to share progress, but also setbacks, and to strengthen and motivate each other.

CONCLUSION

In conclusion, this bachelor thesis provides a comprehensive insight into the phenomenon of compulsive smartphone use and attempts to highlight its causes and effects. The thesis reveals that a variety of factors influence smartphone users' behavior, including the attention economy, persuasive design of apps and user interfaces, and the relationship between our smartphone behaviors and psychological behavioral addictions. A key finding of the work is that today's smartphone use is too user-friendly and that various routines and patterns have developed over time that have a negative impact on smartphone use and the user experience. As a result, today's smartphone usage no longer meets the user's needs, creating a demand for solutions that give users back some degree of empowerment over their interactions with the smartphone. In this context, the work presents a solution approach that aims to promote long-term satisfaction and balance in the use of the smartphone. The work thereby contributes to deepen the understanding of the phenomenon of «*Compulsive Smartphone Usage*» and shows that today's smartphone usage is not always in line with the users' needs. We believe that the solution approach presented in our work is promising and could help alleviate the problematic nature of today's smartphone usage. However, it is important to emphasize that this is still a concept that requires further user testing, evaluation, and iteration to ensure its effectiveness. Overall, the work has shown that despite the challenges in the area of «*Compulsive Smartphone Usage*», solutions can be developed that are both useful and not limiting at all. In this context, our thesis emphasizes the importance of raising awareness of one's own smartphone behavior as an important step toward a wholesome smartphone use.

Further steps

With our work, we present a concept that is intended to help smartphone users to achieve a satisfying usage experience in the long term. In doing so, we place particular emphasis on the user's empowerment in dealing with their device. Our system makes it possible to adjust the routines for handling the smartphone to the user's individual needs and helps to track them more effectively. Although we have already conducted user tests with various personas, it has not yet been possible to test the concept in real-life situations. Further development of our prototype would be necessary for this. Currently, our prototype consists of pre-produced content that would need to become usable through an effectively programmed prototype with real content. The insights gained from a broader user base would help us to further improve and optimize the prototype.

However, we face several hurdles in implementing this complex concept. On the one hand, there are high costs involved in order to code the concept. On the other hand, the mobile operating systems

limit us in our possibilities of modification, since our concept strongly interferes with the existing system. Therefore, we see the next step in spreading our concept on different channels to draw more attention to our topic. We would like to showcase our work and create a website where people can learn about our concept and get to know the principles of the individual elements of the concept. By drawing enough attention to our product, we see the chance that our basic idea will reach the right people and that our idea can influence future developments of operating systems. We are convinced that our concept can make an important contribution to a positive and sustainable smartphone usage.

Learnings

During the process of our bachelor thesis, we have learned numerous valuable lessons that will be useful not only in our current project, but also in our future work as interaction designers. One of the key lessons we learned through our work is that delving into completely unknown fields requires a significant amount of time in order to draw solid conclusions. Particularly in the area of behavioral psychology, it was crucial for us to delve deeply into this topic in order to ground the concept of our project. In doing so, we learned that a solid base of specialized knowledge and theoretical principles is essential in order to be able to develop practical solutions. Another important factor that proved to be essential was the importance of scheduling more time for user testings, as these tests were an incredibly important source of feedback and helped us enormously in our process and in our way of thinking. Also, feedback from different people such as mentors, classmates, or random people always played a big role in our work process. In addition, quick prototypes proved to be an extremely helpful tool to test and try out the potential of ideas. Taking into account influences and inspirations from other fields proved to be of great importance for our work. In our project, for example, it was of central importance to engage with the field of behavioral psychology. After an in-depth study of this field, we tried to transfer and implement a therapy method (*CBT*) to our concept. Furthermore, we oriented ourselves to movie or music editing tools when designing the adjustment of the user routines.

It has been shown that it can be extremely helpful to draw inspiration from completely different fields in order to develop innovative solutions. Furthermore, the redesign and the new conception of an already existing system was a very demanding task. This challenge resulted from the complexity of the system, which included several apps and functions and thus required an overarching navigation and orientation. In contrast to a single application with a clearly defined framework, the development of a new navigation structure for the system proved to be extremely complicated. Therefore, it was extremely advantageous to work in a team of two, as continuous communication was possible and there was always an exchange of ideas. The possibility of consul-

tation also minimized pressure, as it was possible to overcome challenges together. In our work process we were often accompanied by random design decisions. Especially when creating the wireframes, we limited ourselves to shades of gray, which subsequently proved to be useful for a reduced user interface. Despite their seemingly arbitrary nature, in our case such random design decisions, nevertheless led to surprisingly meaningful results. From the perspective of a prospective interaction designer, we also realized that a user interface does not always have to be designed with a certain «*juiciness*» in mind. Instead, it is of great importance to carefully analyze the user groups and consider changes in terms of long-term use of the service. With our work, we have also found that there can indeed be a design that is too user-friendly. We also discovered that a balance between desktop work and hands-on design was crucial for us to achieve success in such a long process. It was important not to get stuck in the research process, but also to actively engage with the actual design in order to maintain motivation and the fun factor. Another important aspect we learned is to trust the process. Often the path towards finding a solution turns out to be difficult and complicated, however, it is of great importance to trust the process regardless and not get discouraged. Especially with projects of long duration and an extensive ideation process, it is important to be patient and keep the focus on the goal. Overall, we have definitely been able to gain a lot of valuable experience through our work, which will certainly be useful to us in the future.

Contribution

Our bachelor's thesis highlights the importance of a responsible and ethical design of technologies and shows how purposeful design can empower users to manage their behavior in order to achieve a positive interaction with technologies in the long run. In our work, we have tried to prioritize user empowerment and their ability to act in order to create a truly satisfying user experience. In doing so, we created a different view on UX design for long-term users and highlighted the necessary difference between inexperienced users and experienced long-term users. Furthermore, unlike all other related projects reviewed, we have tried to work with as few constraints on the user as possible by using a solution approach that prioritizes a positive objective. Our focus is on assisting users in attaining their goals, rather than blocking their negative behaviors. Overall, we think our project contributes to the ongoing discourse on ethical and humane design, as well as the responsible use of technology. In doing so, it can be inspiring in terms of prioritizing user empowerment to foster an actual and satisfactory user experience.

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Ground

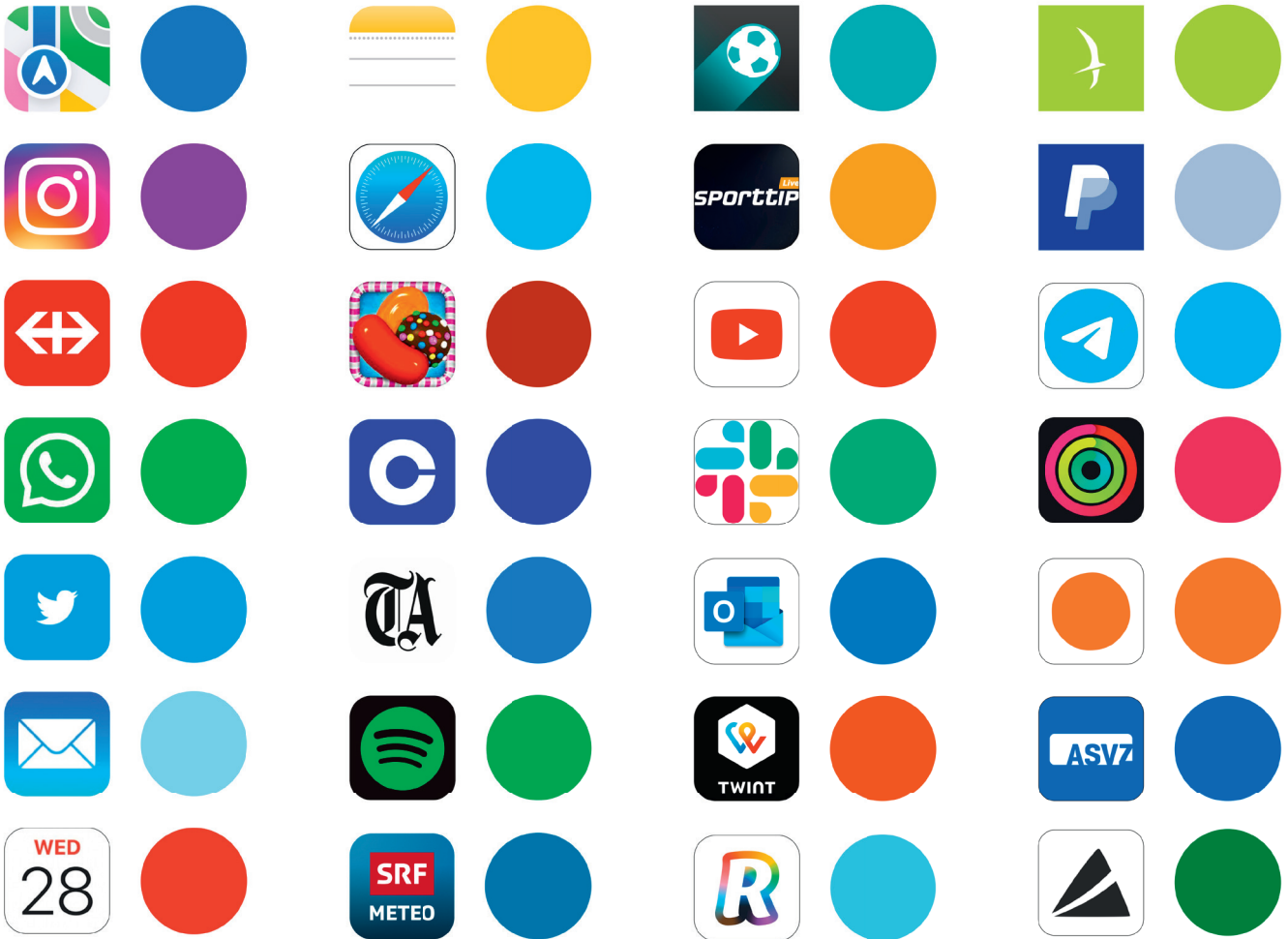
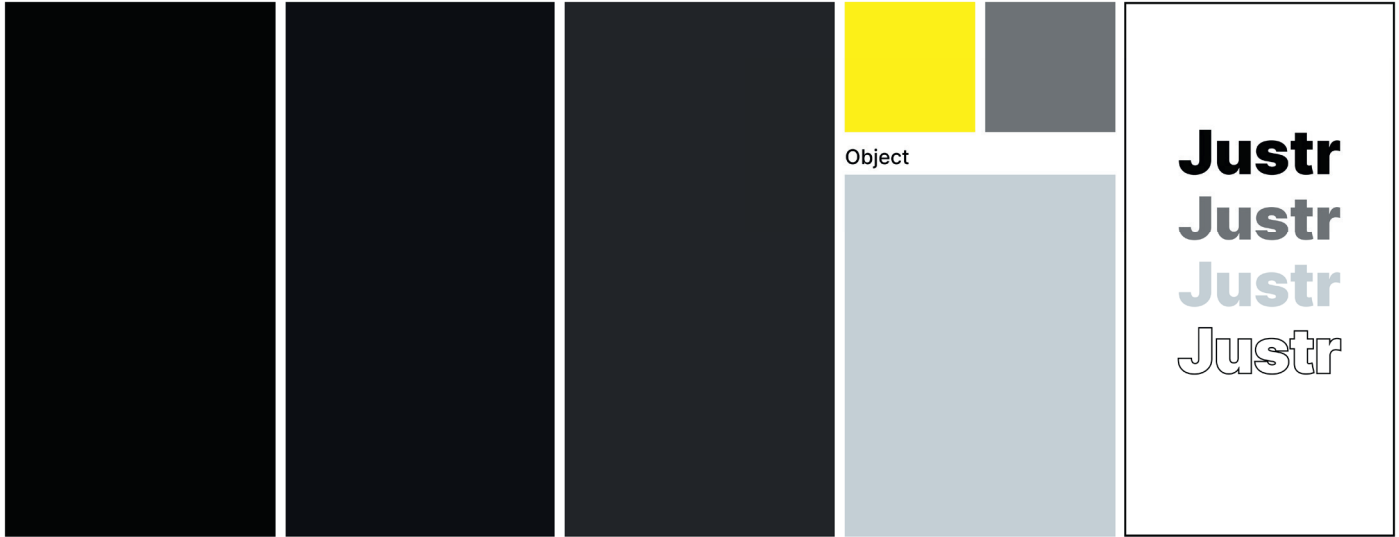
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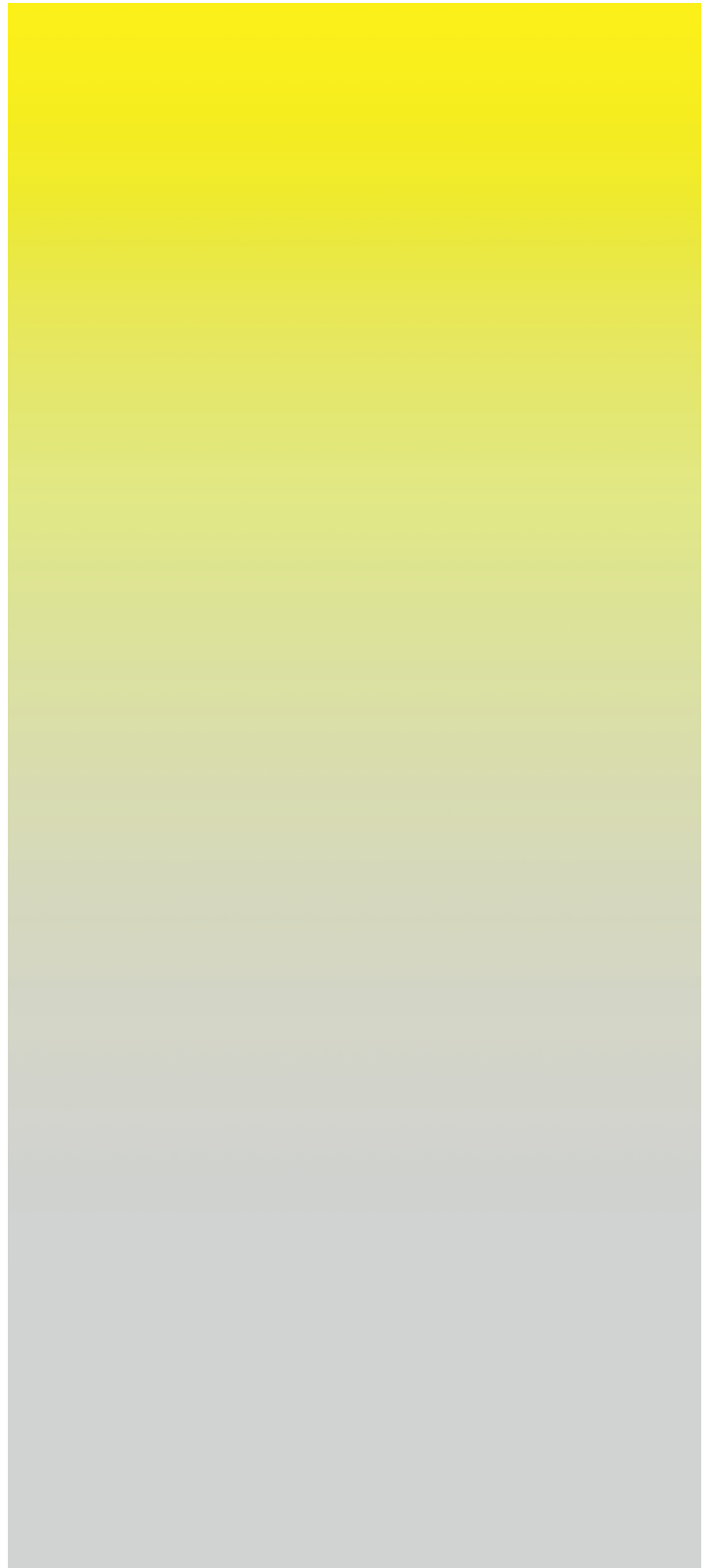
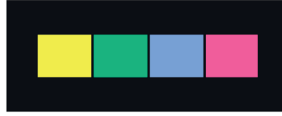
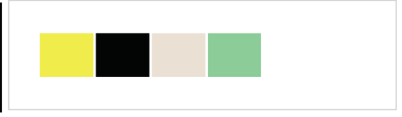
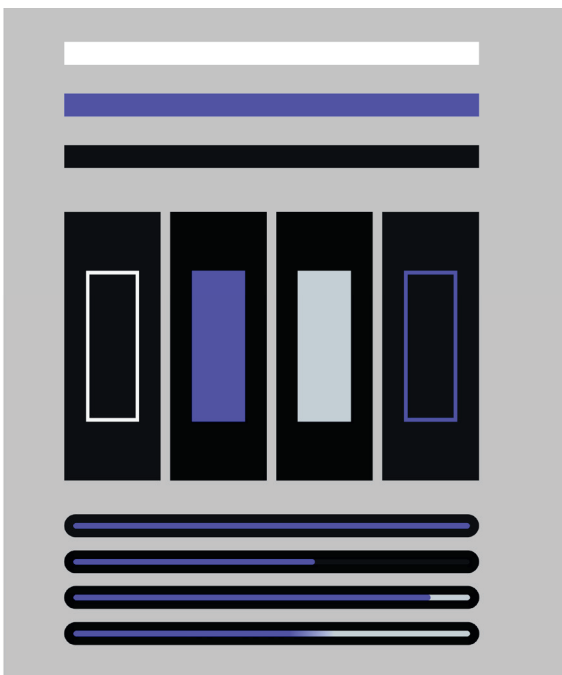
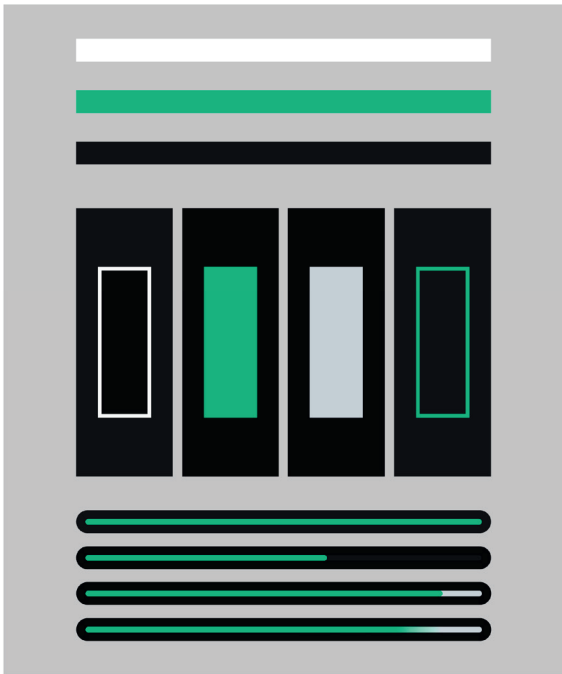
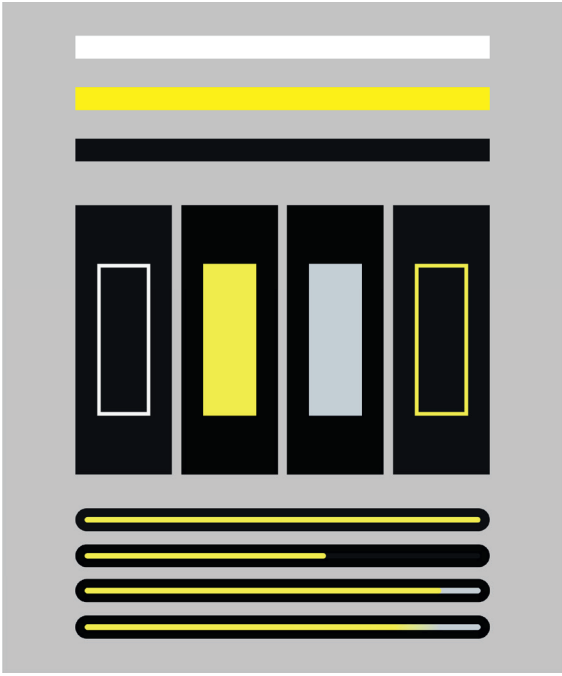
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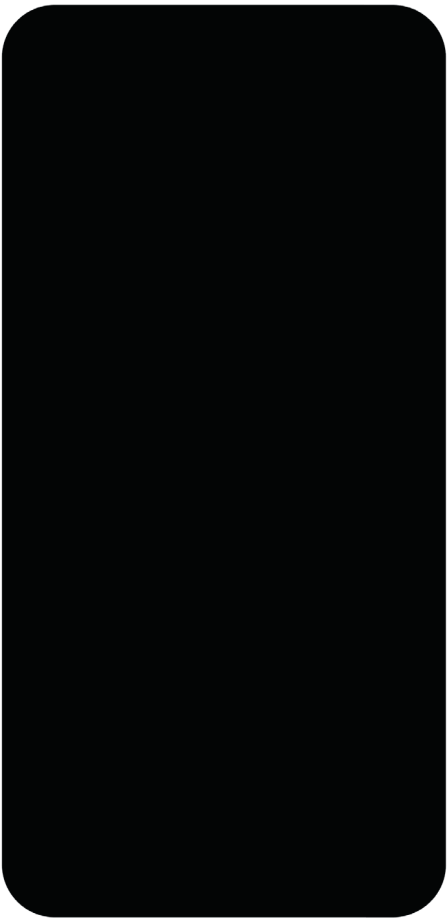
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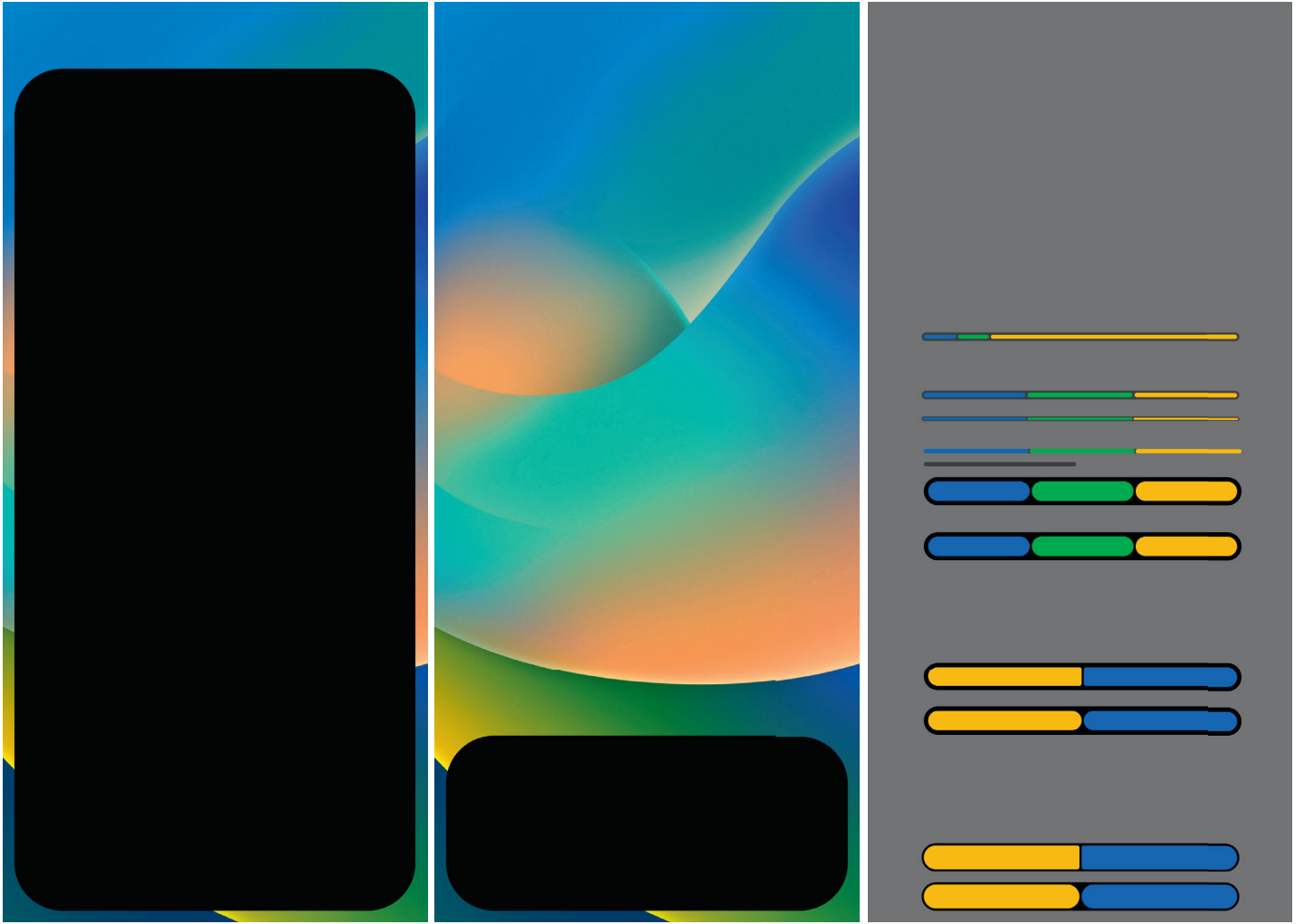


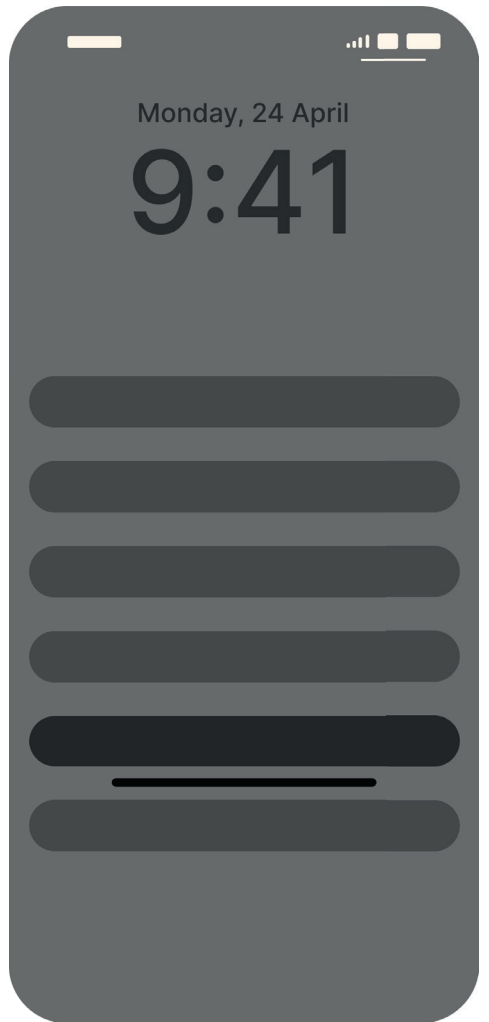
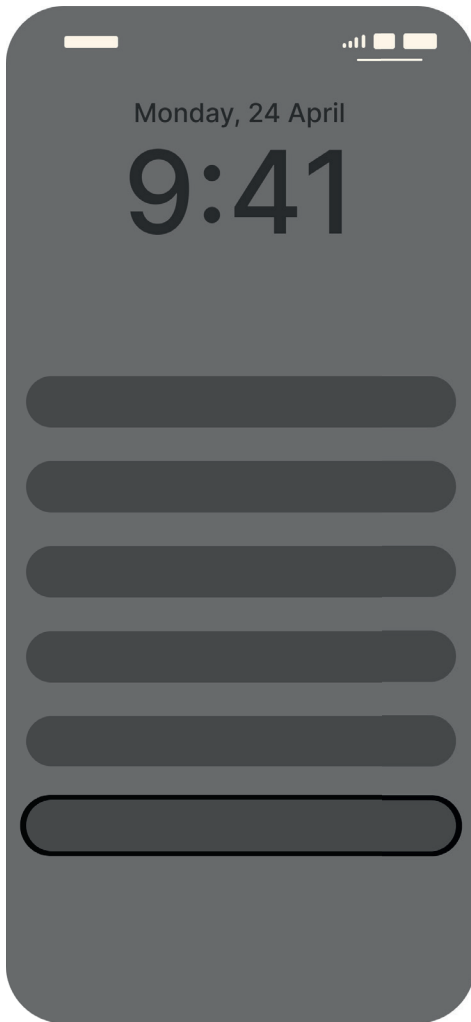
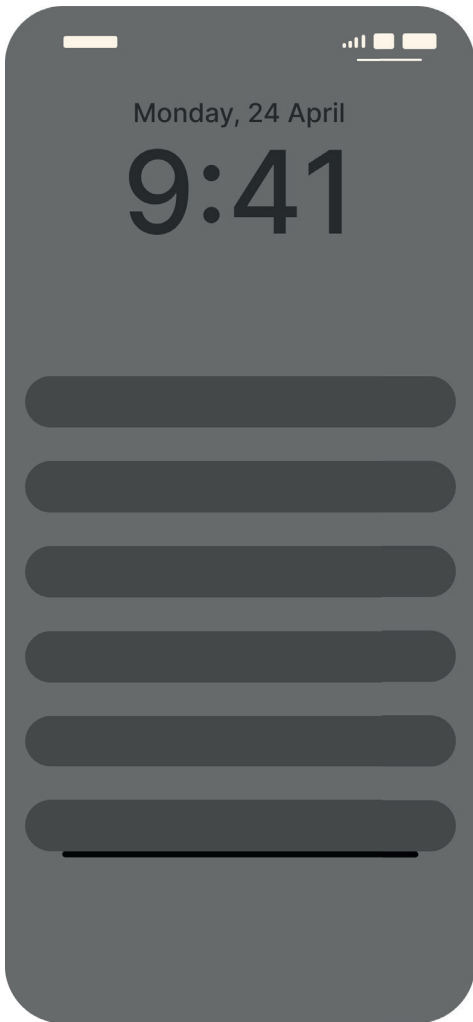
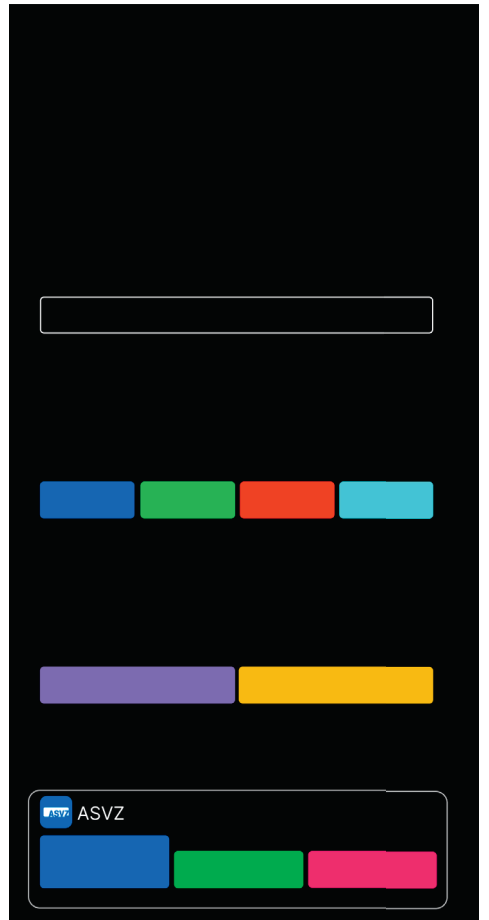
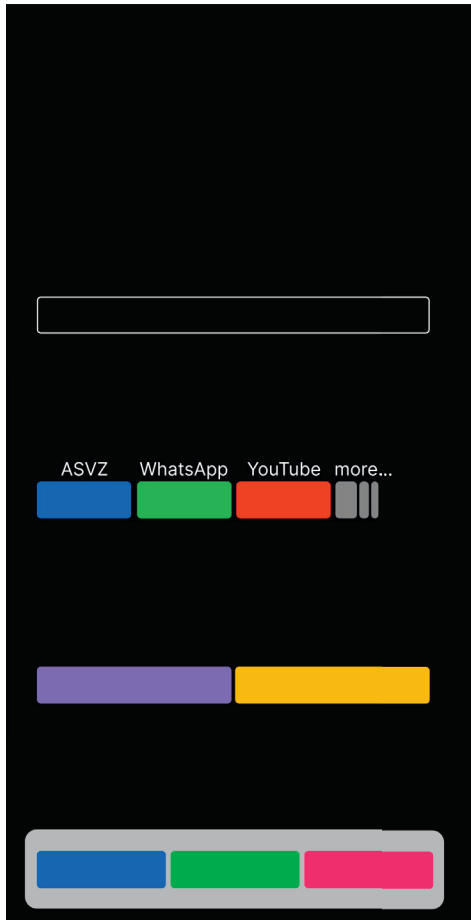
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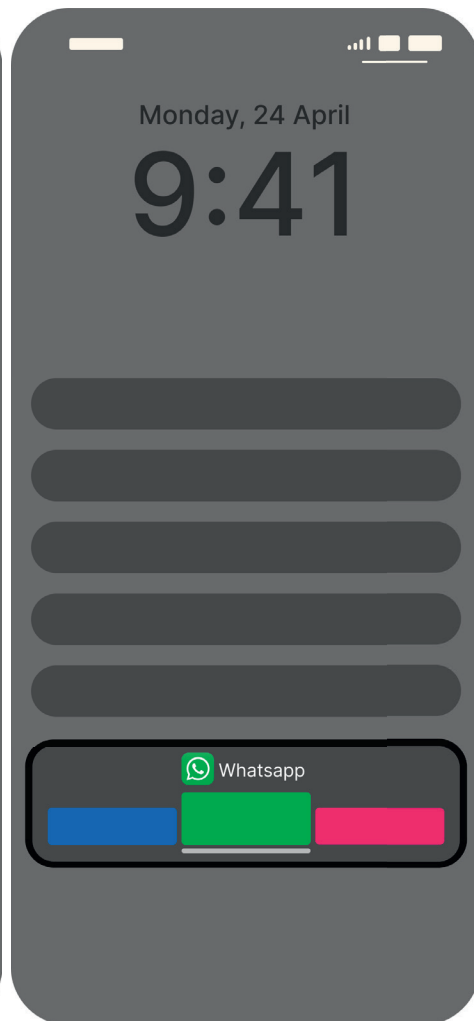
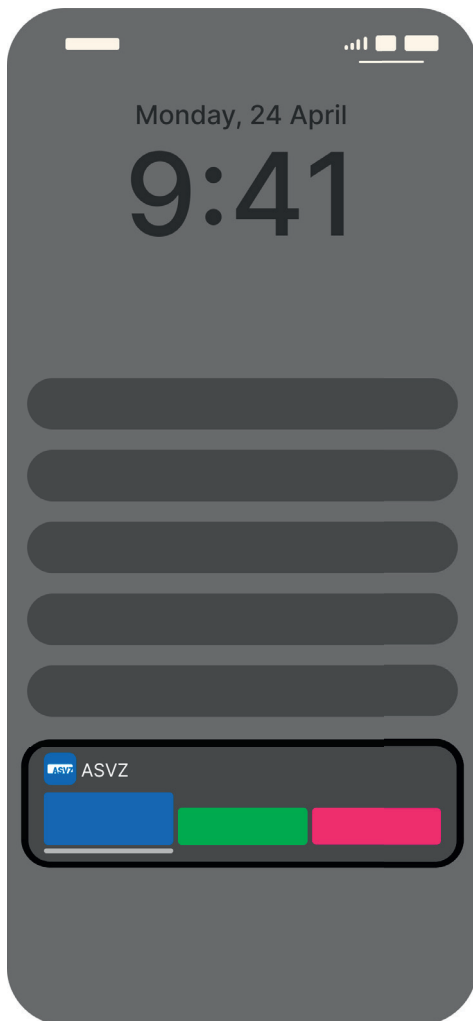
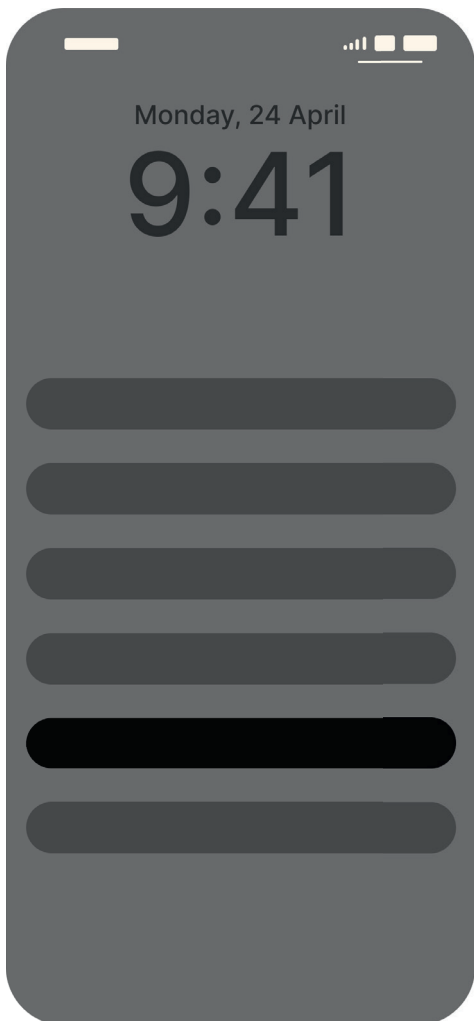
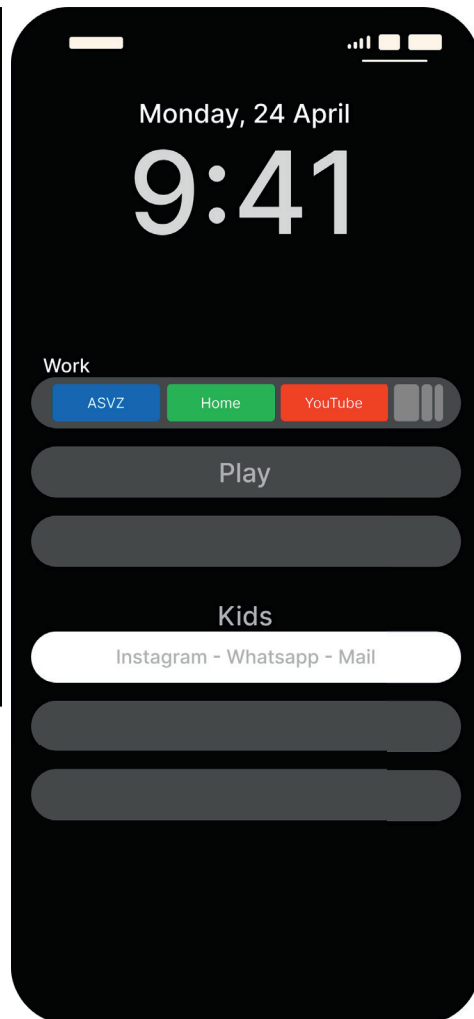
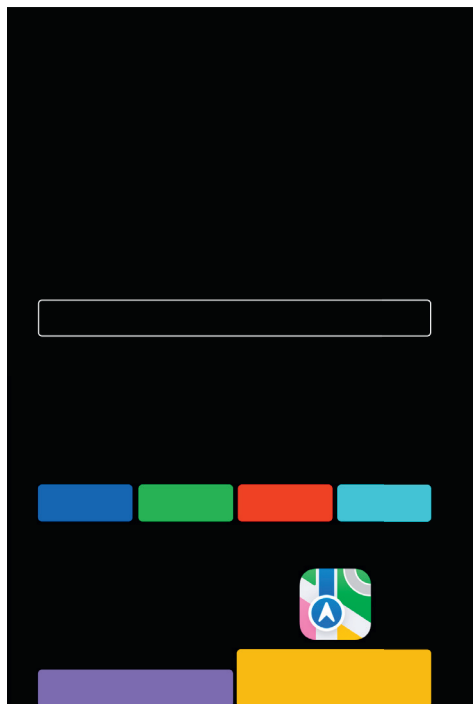
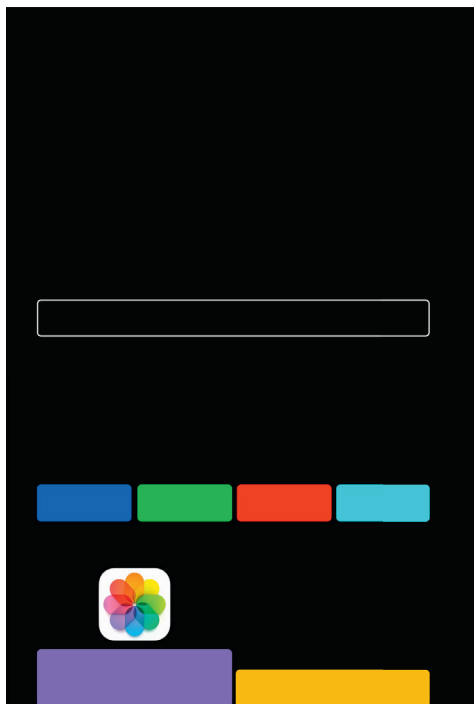
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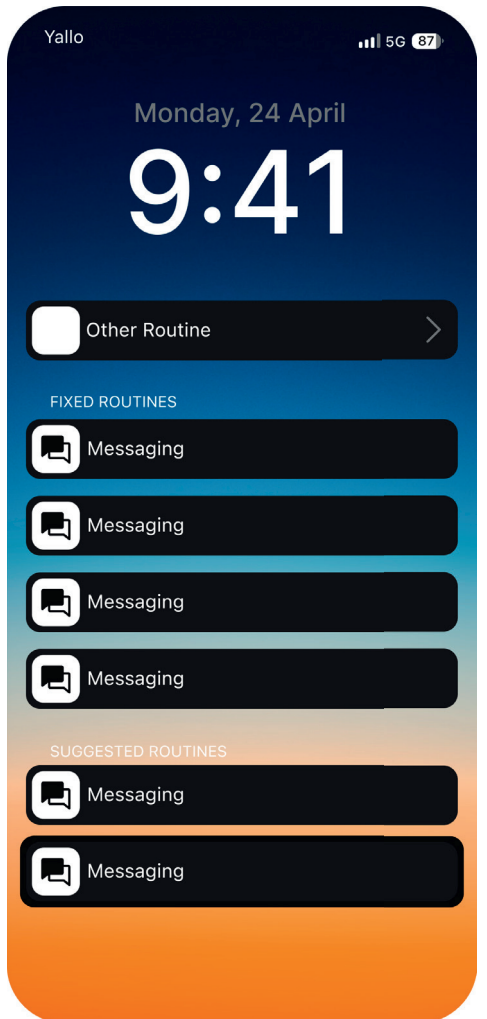
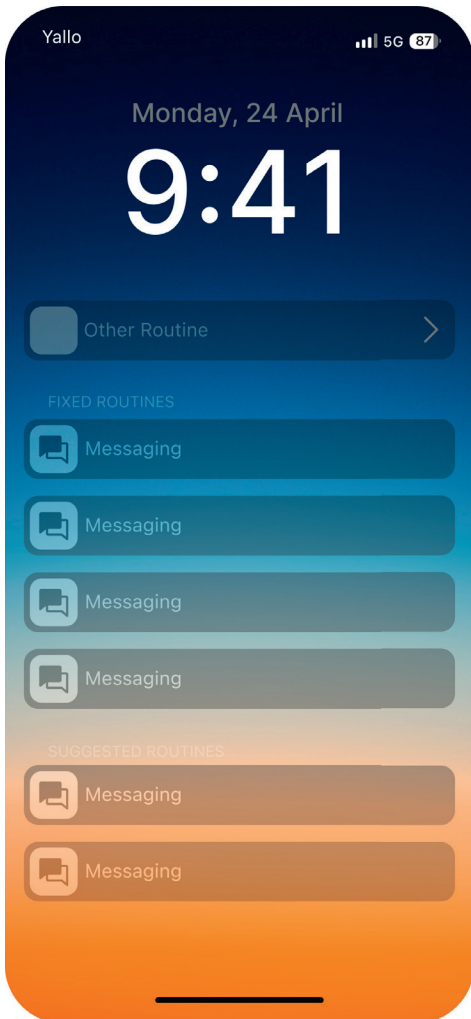
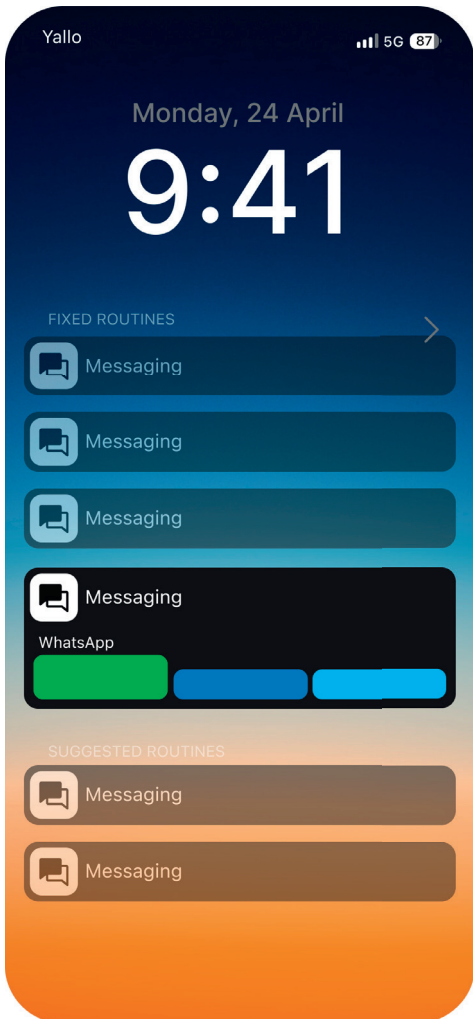
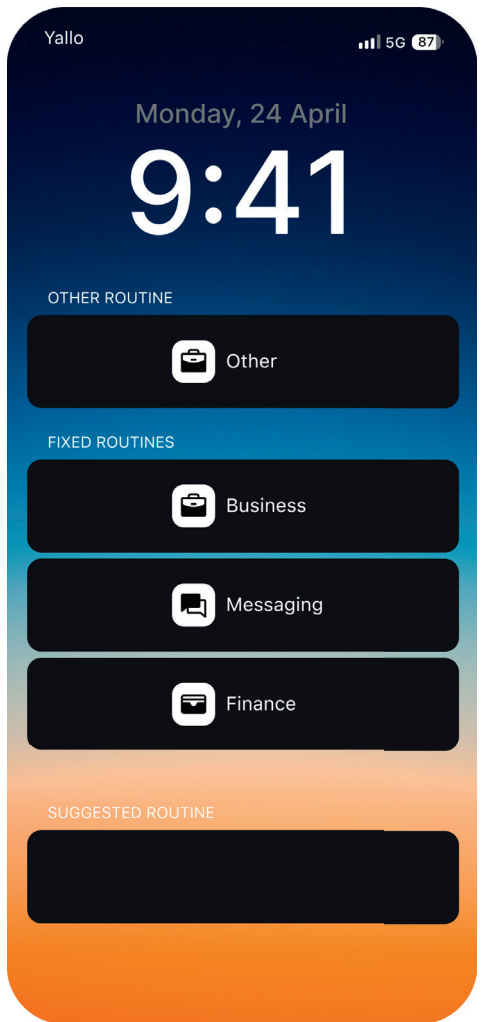
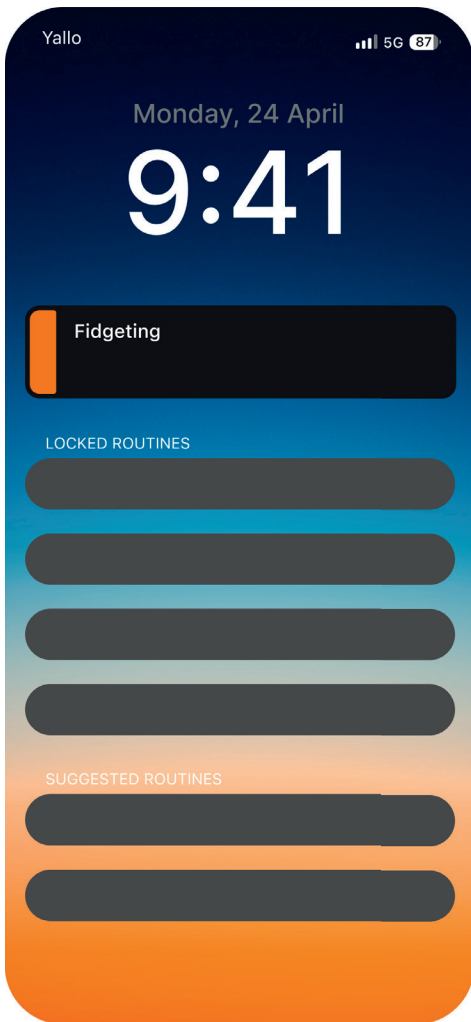
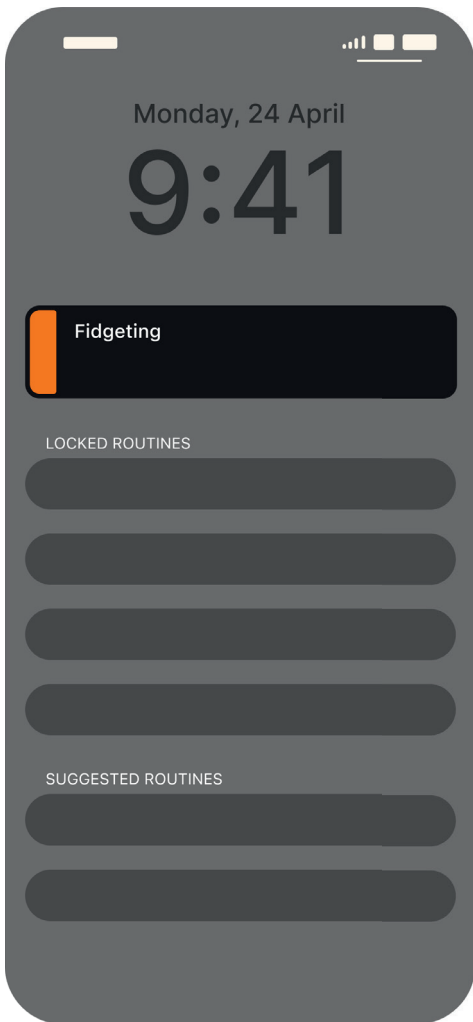
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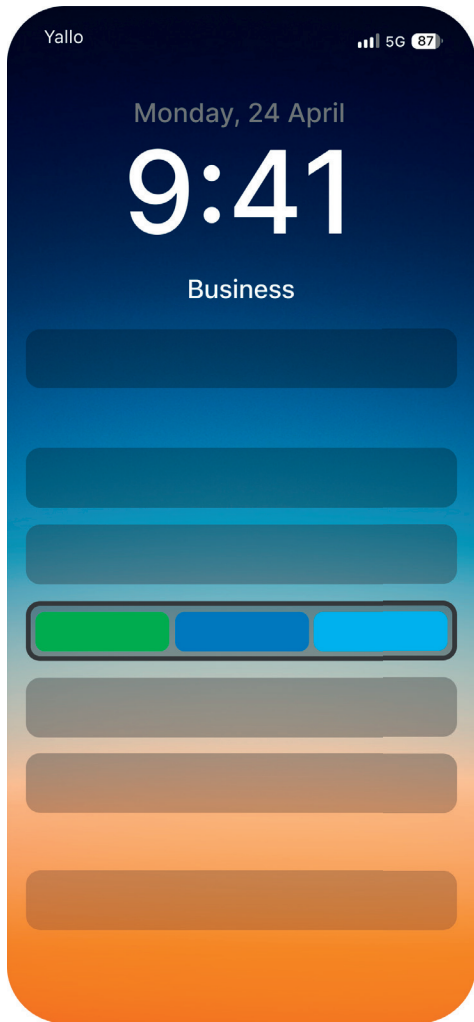
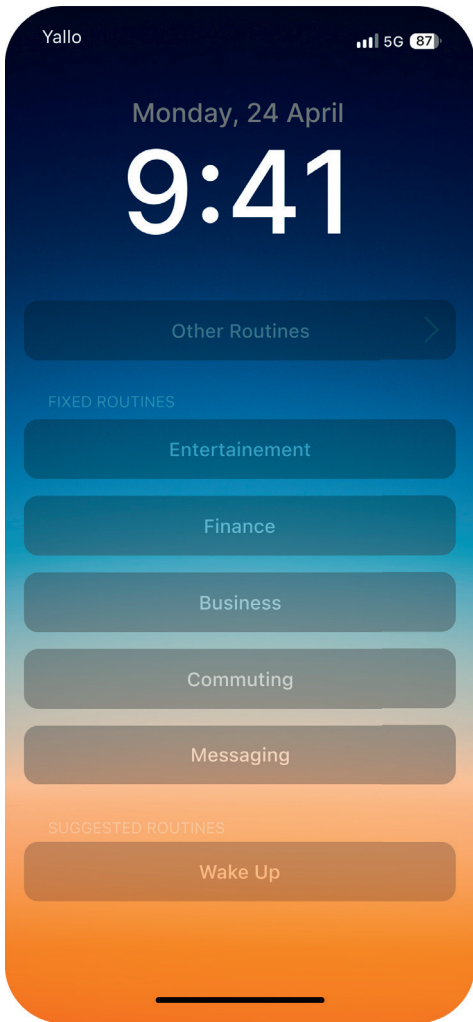
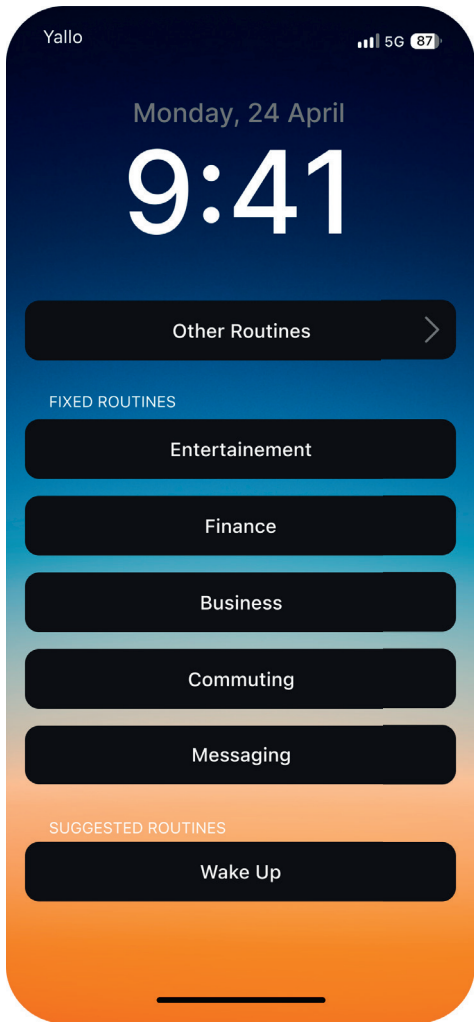
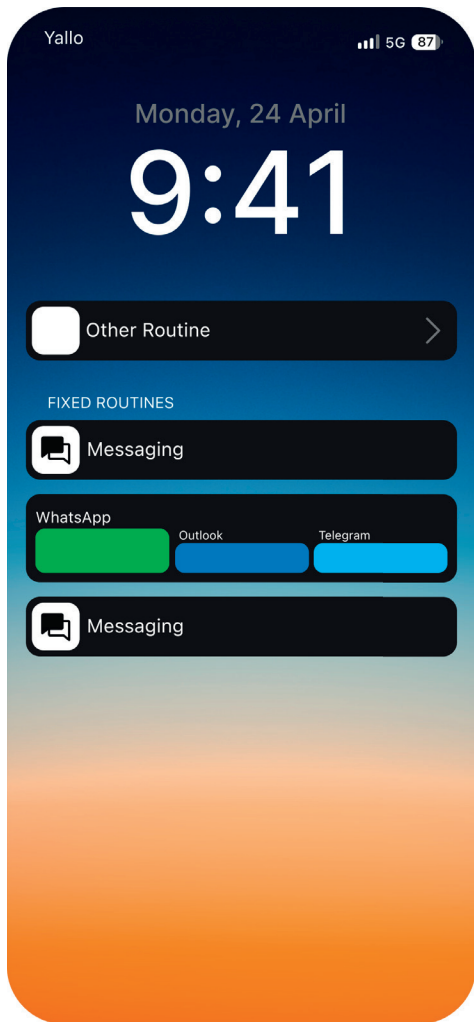
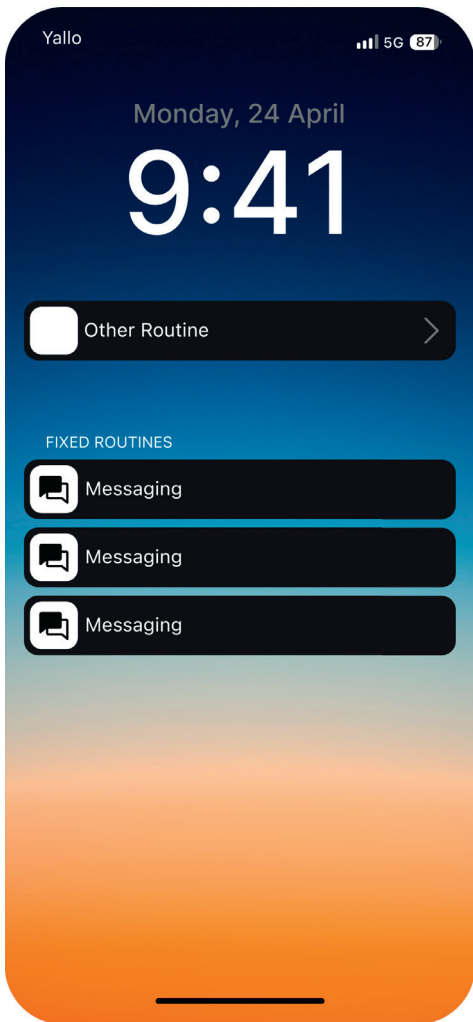
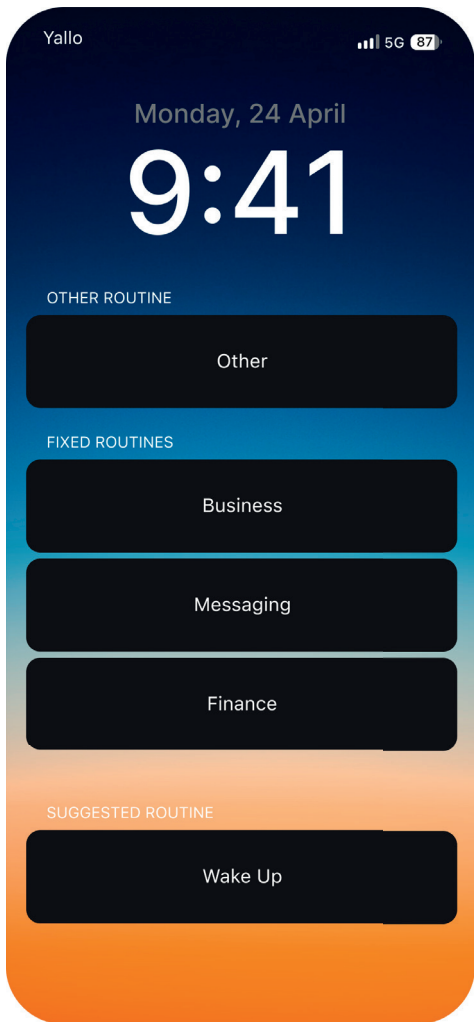


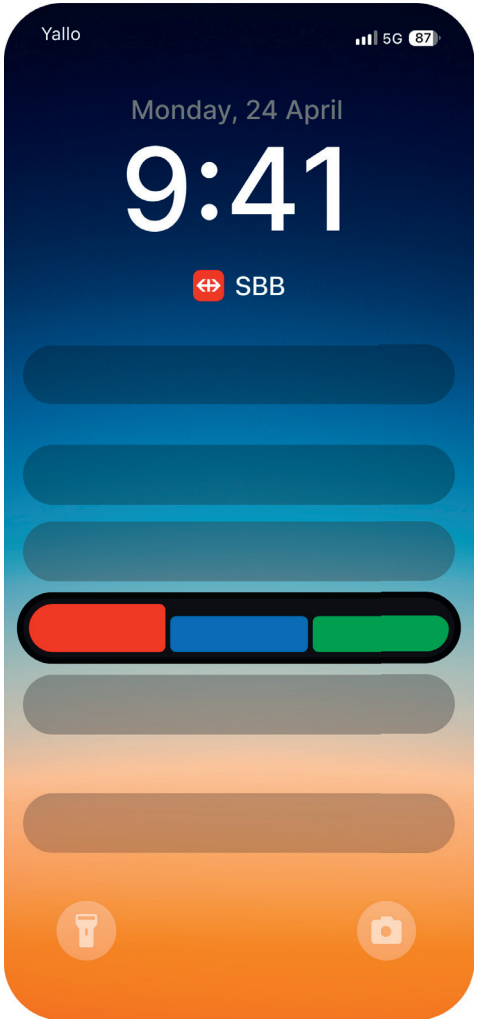
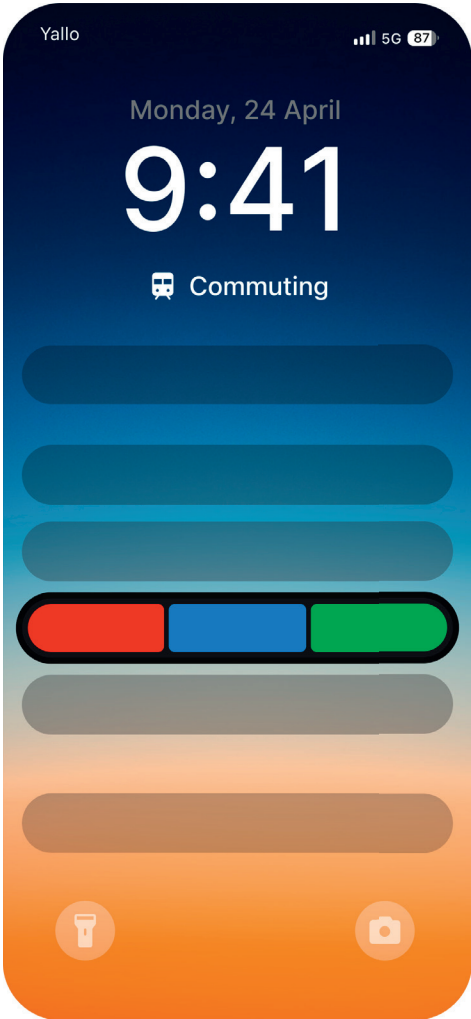
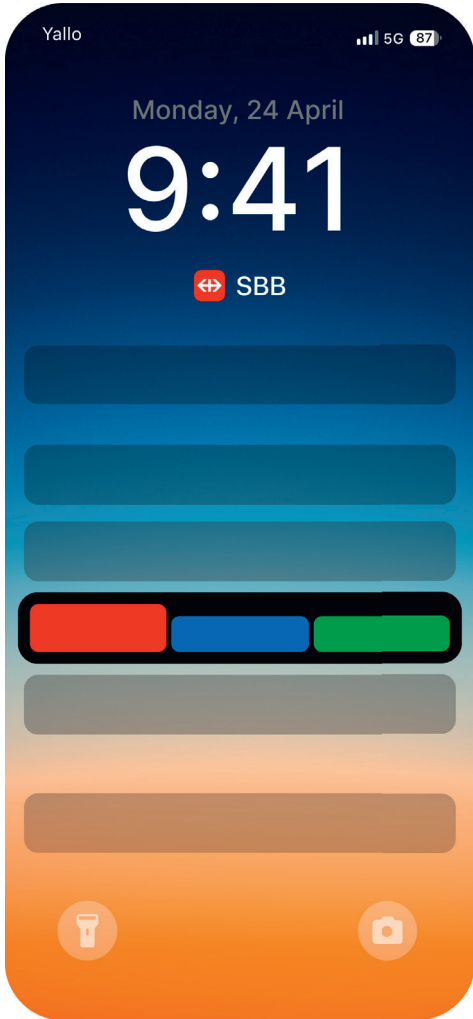
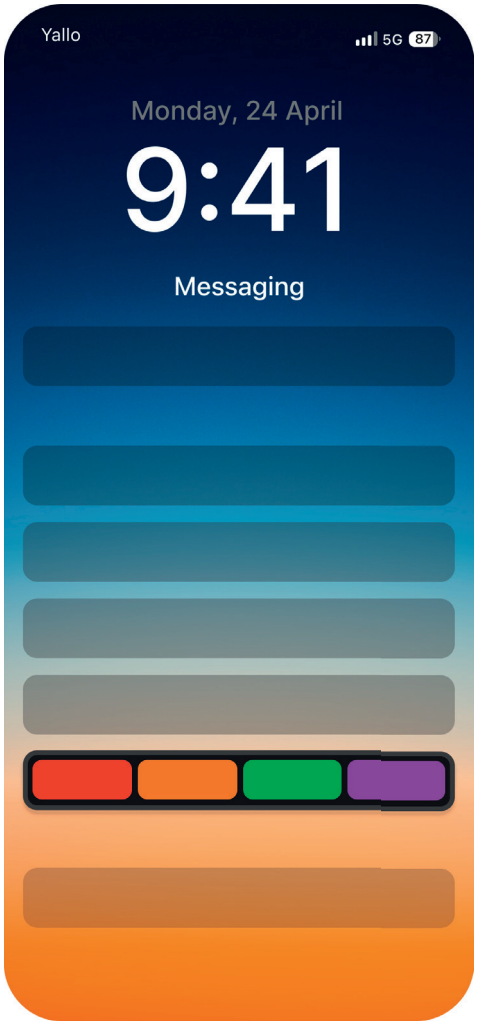
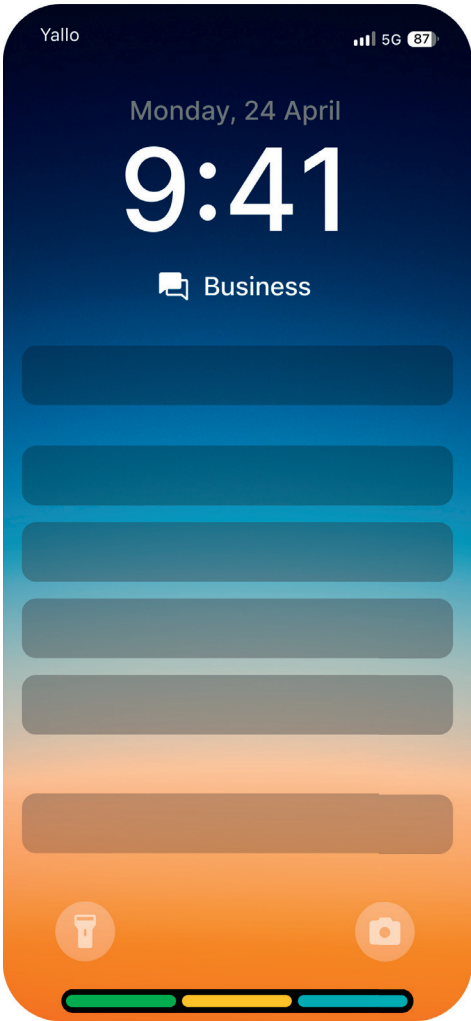
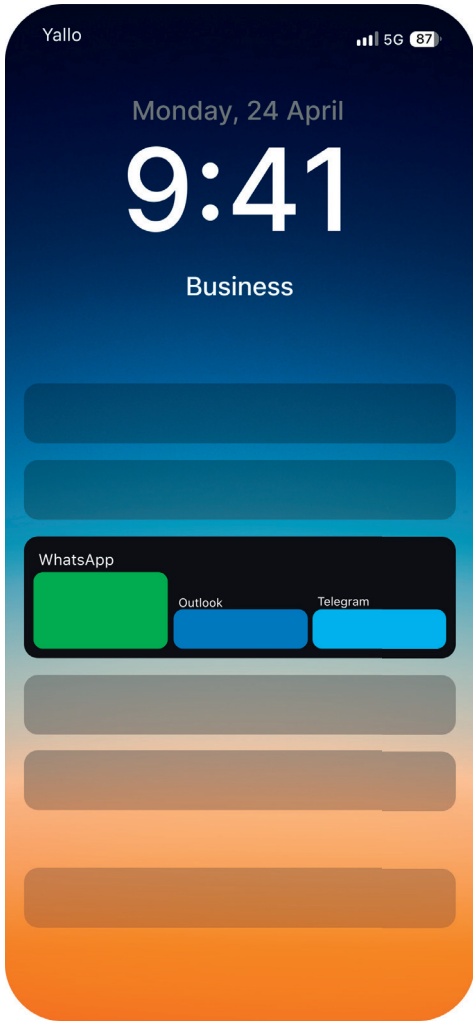


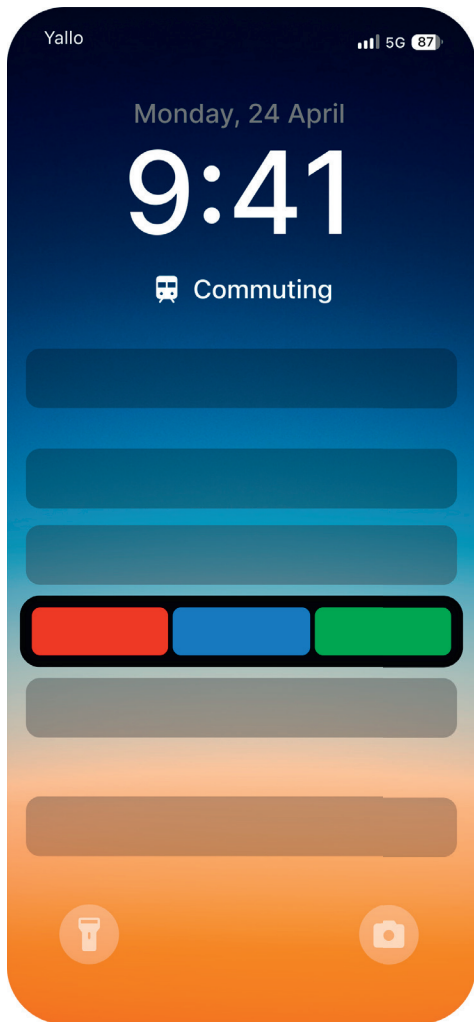
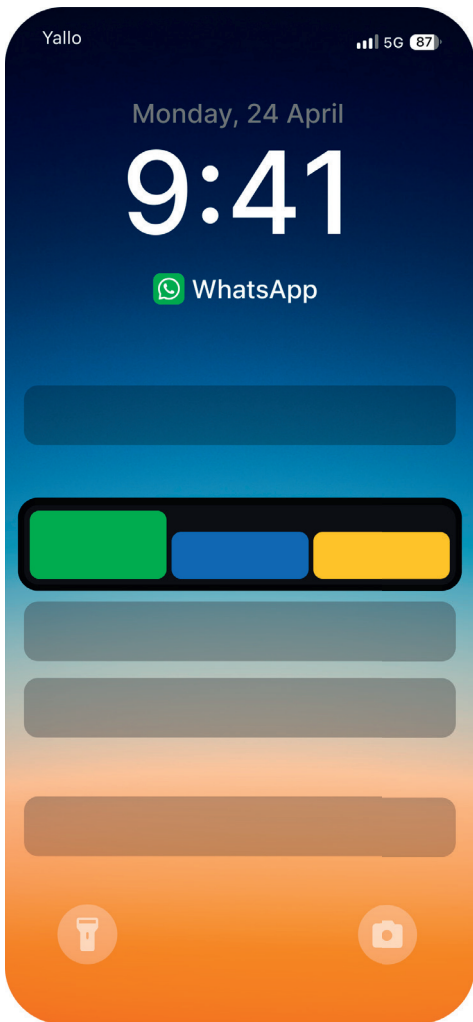
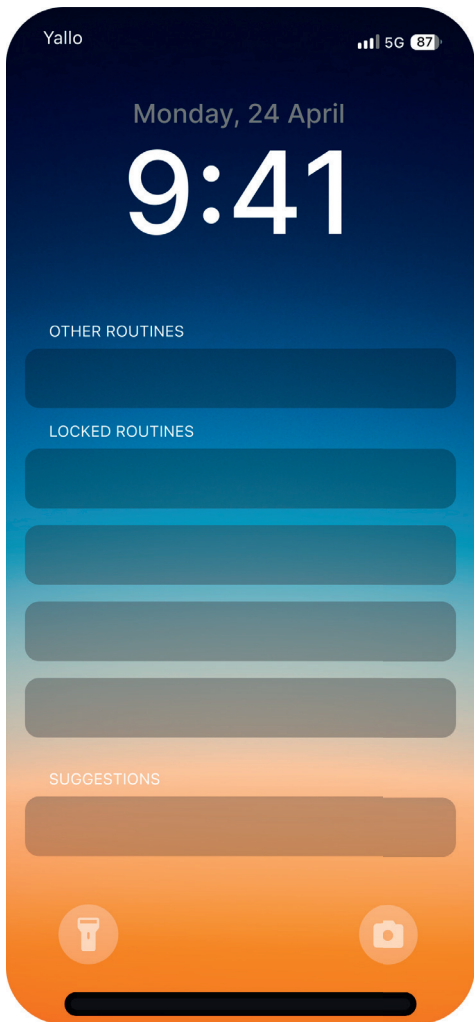


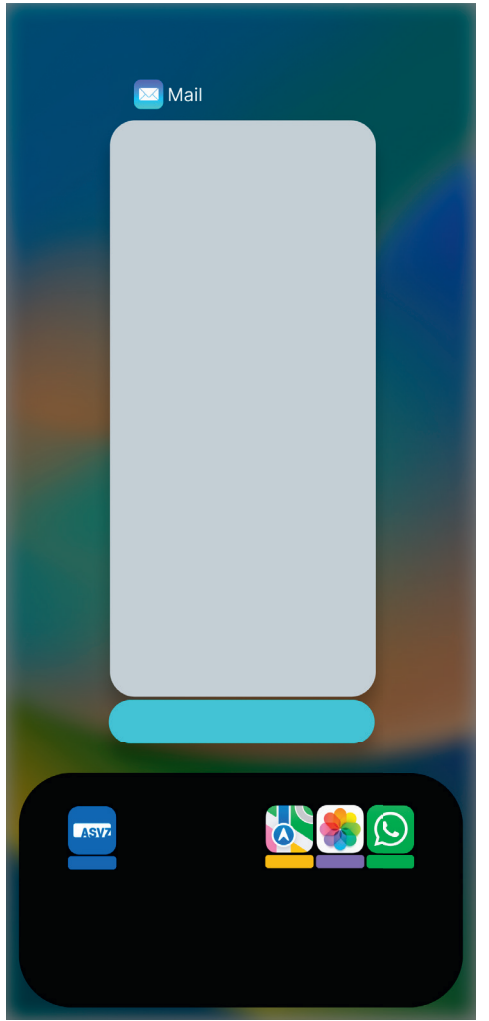
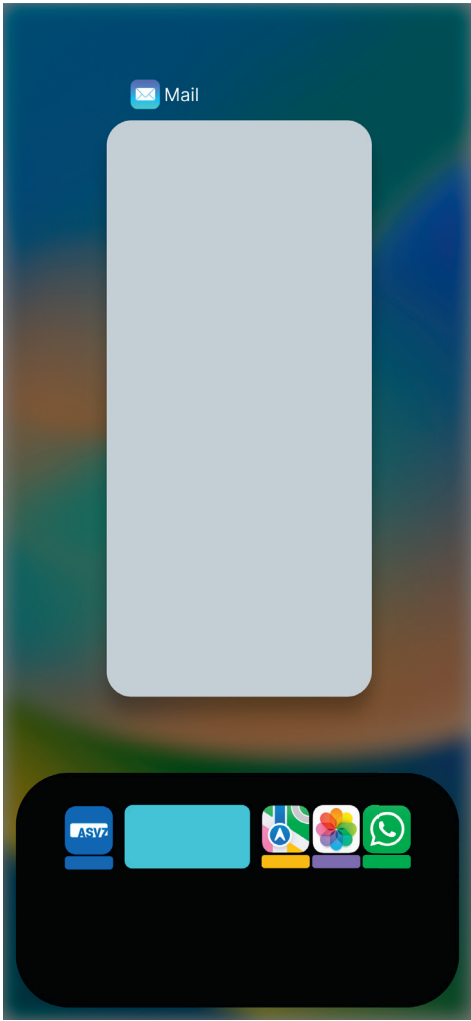
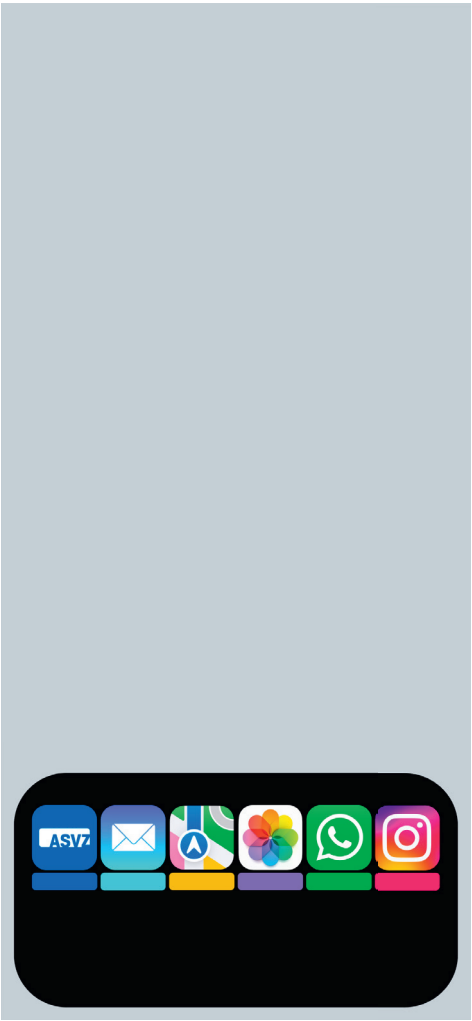
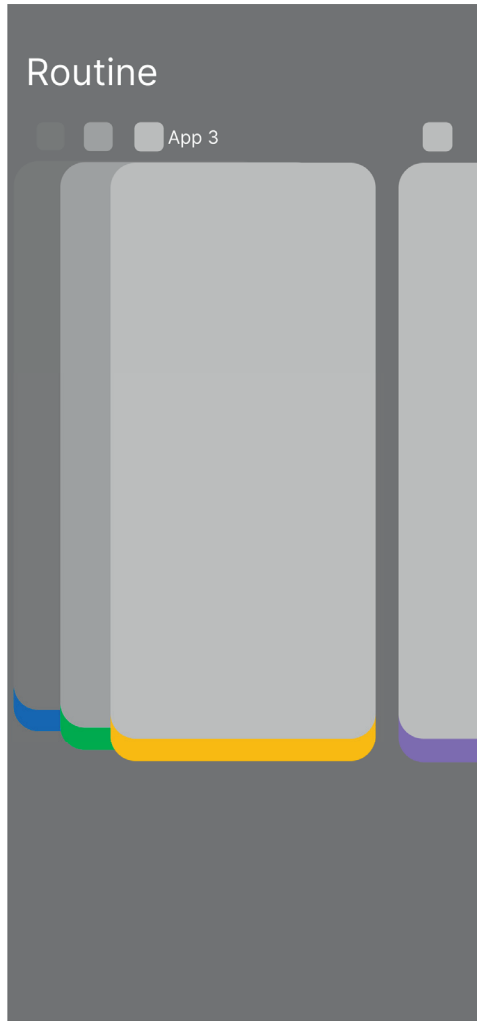
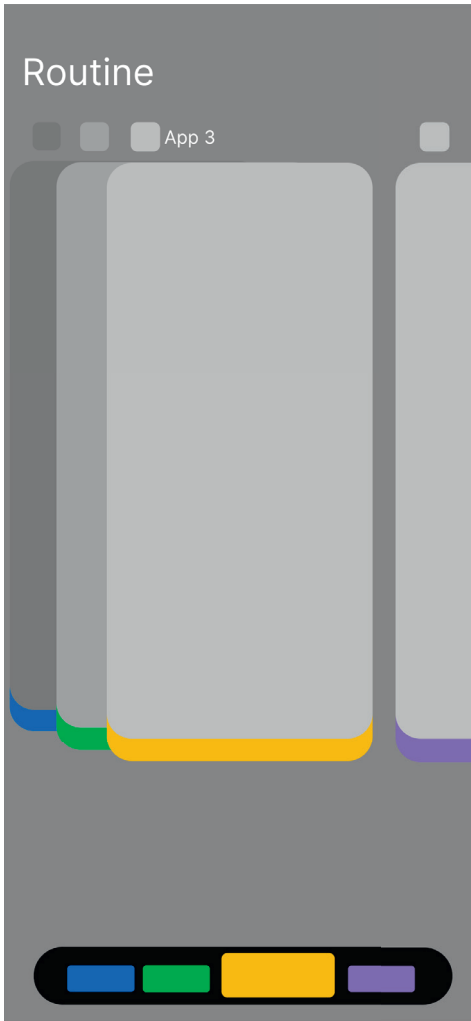
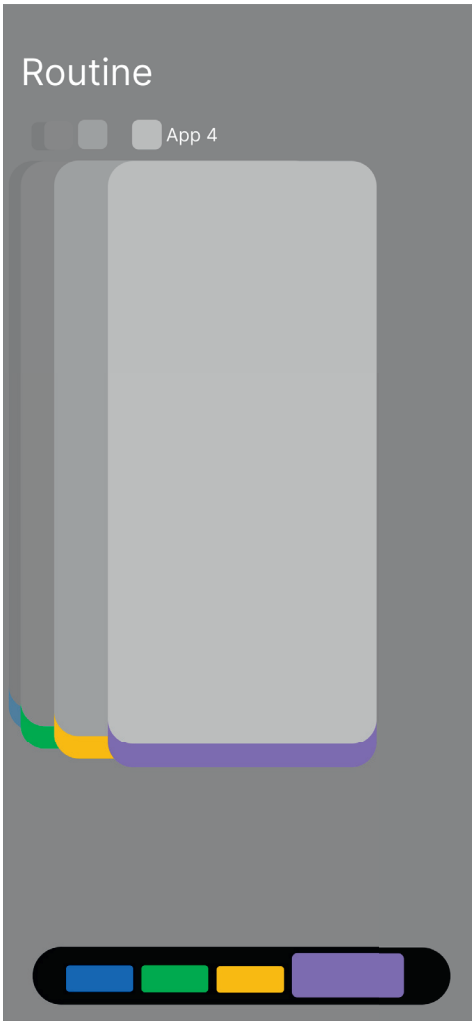


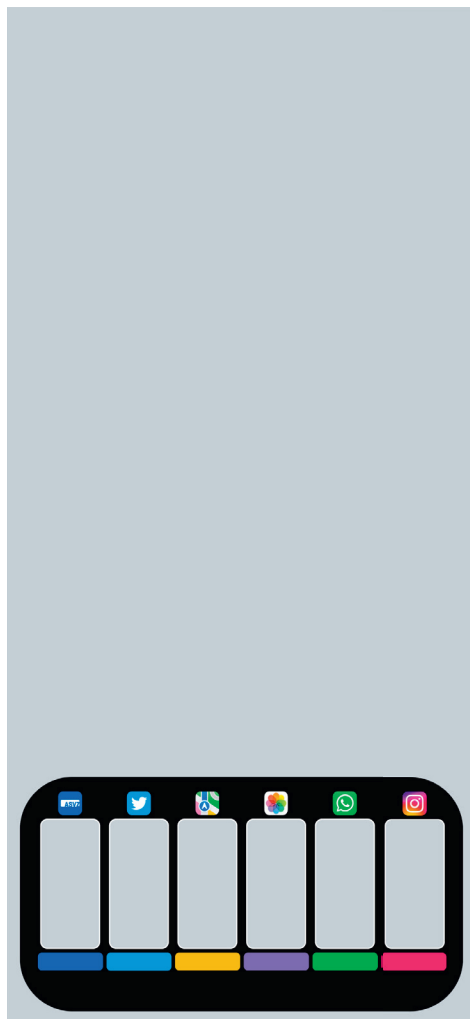
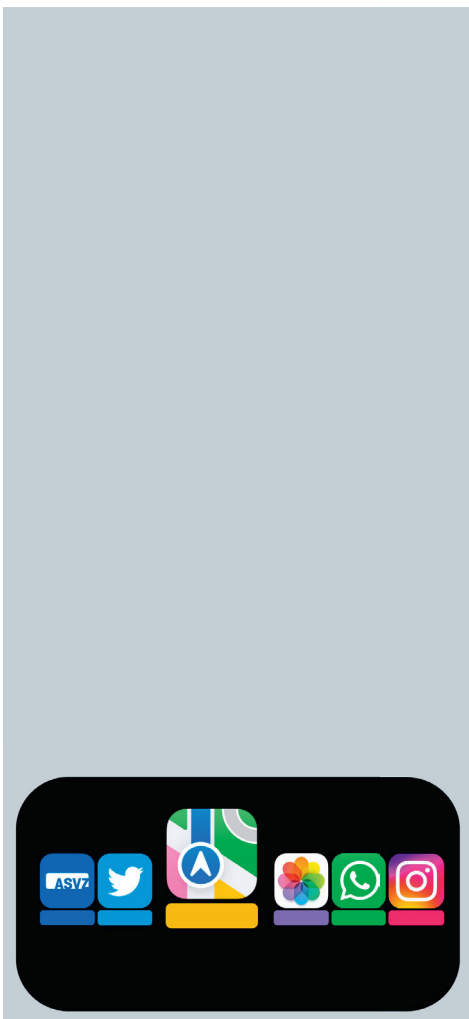
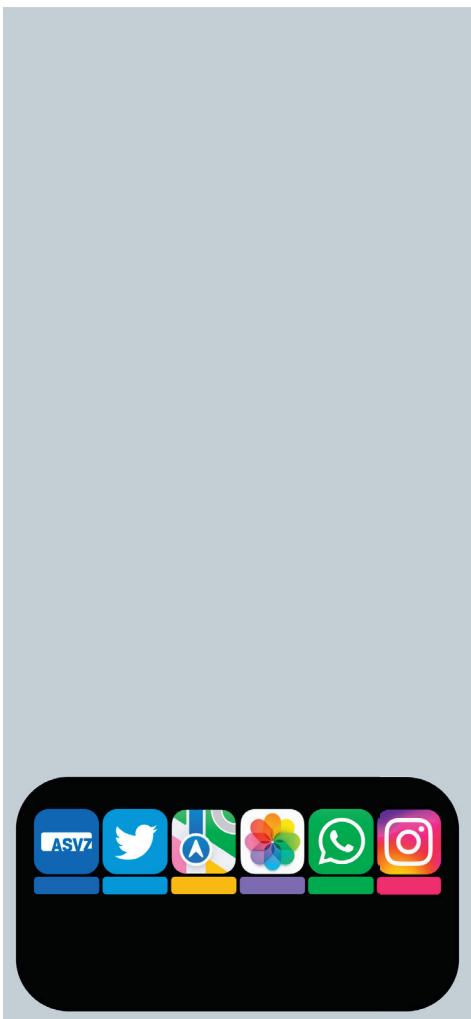
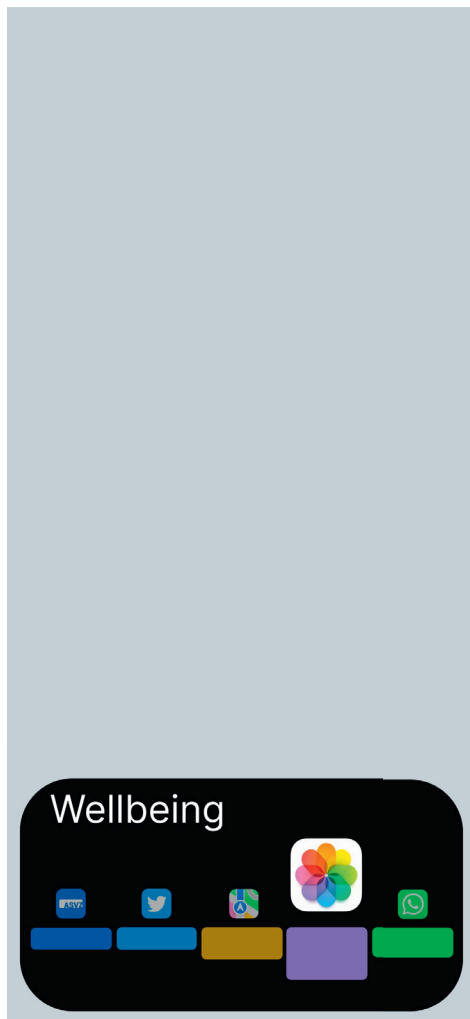
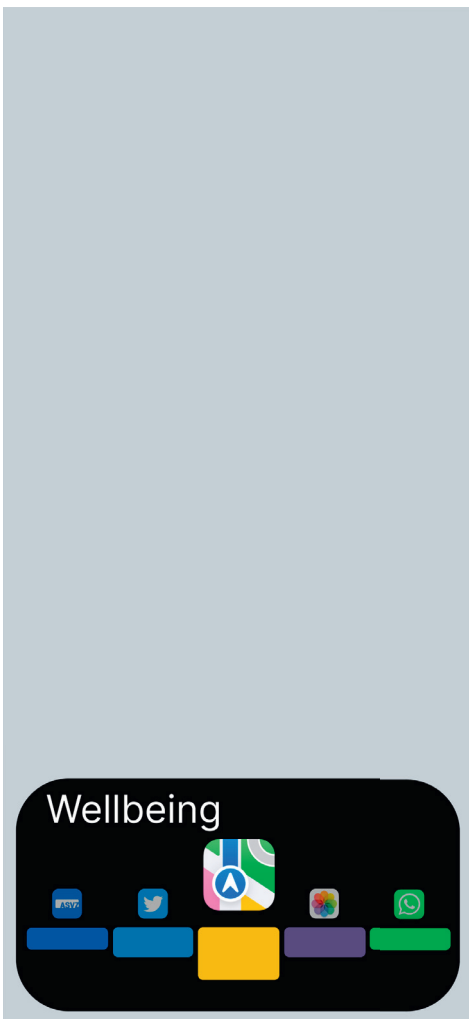
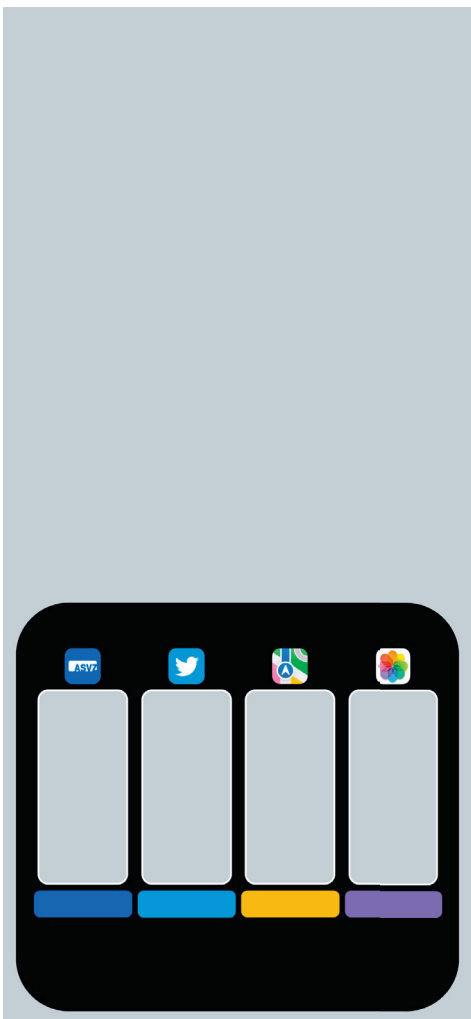


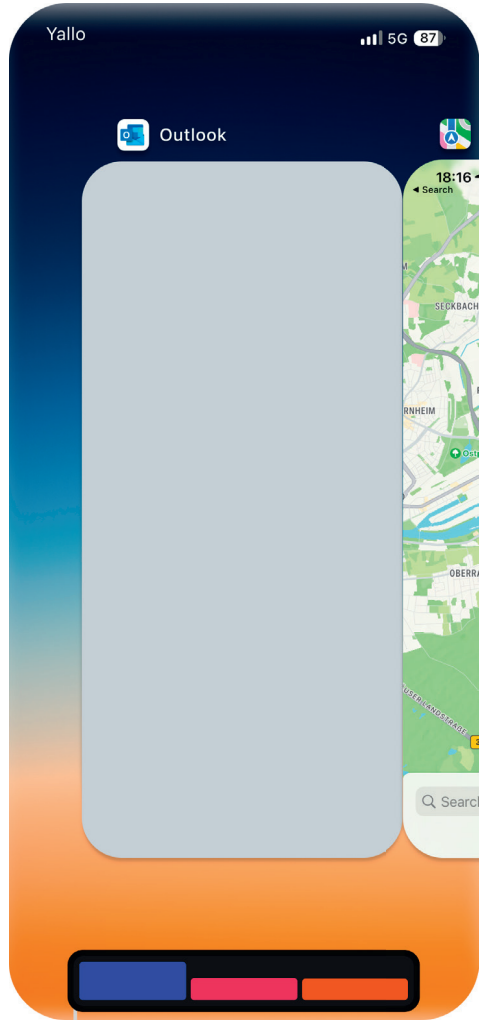
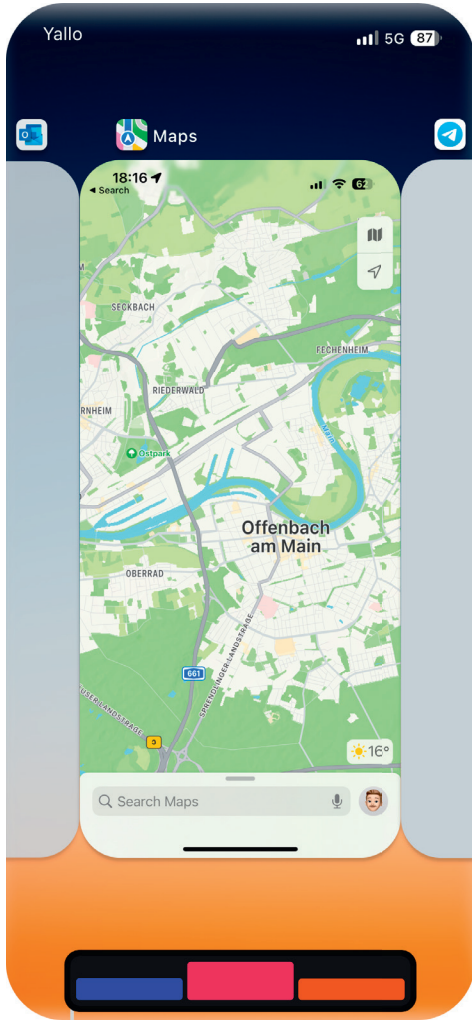
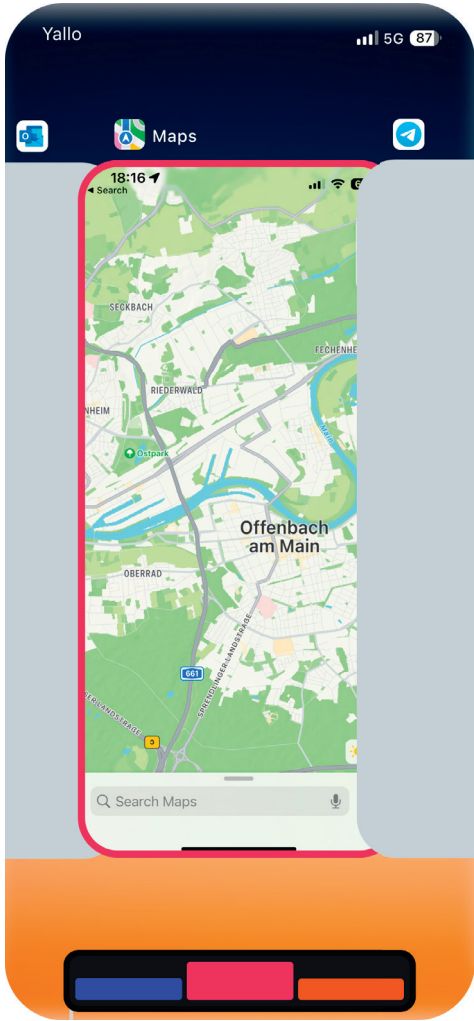
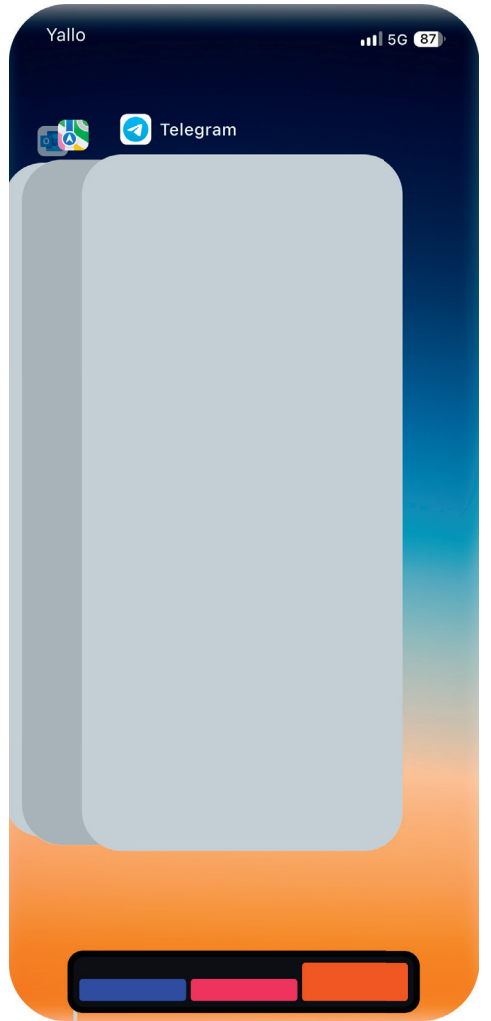
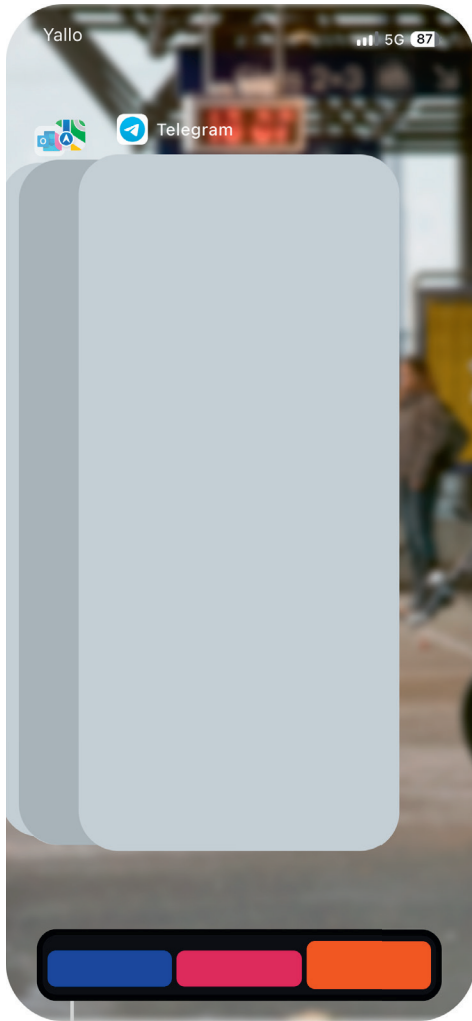
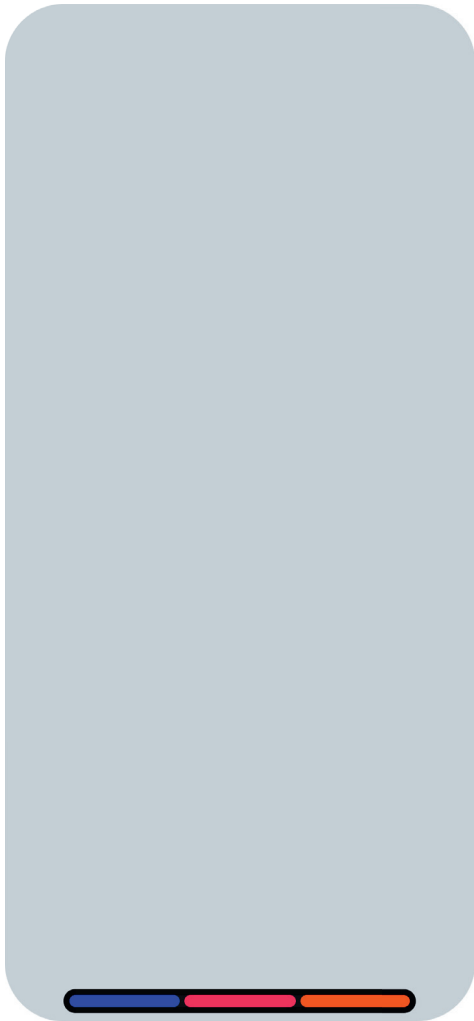


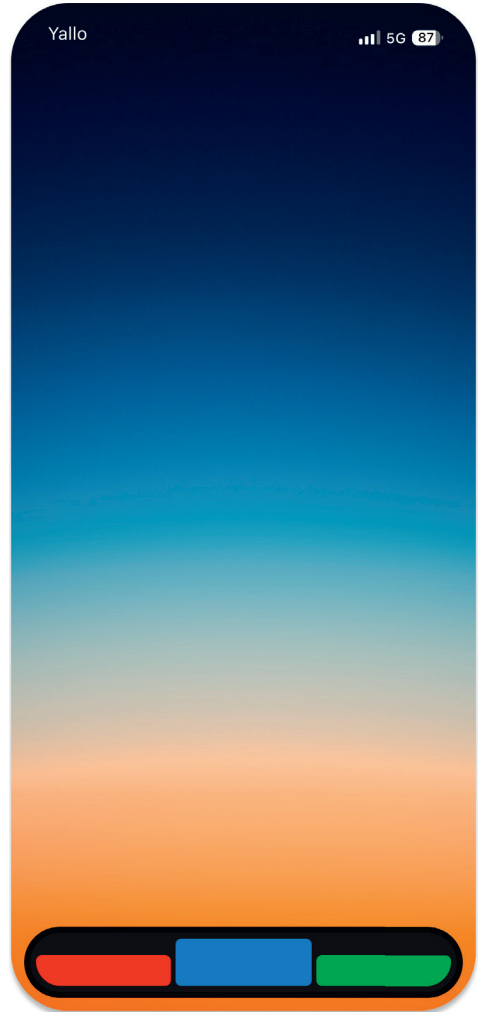
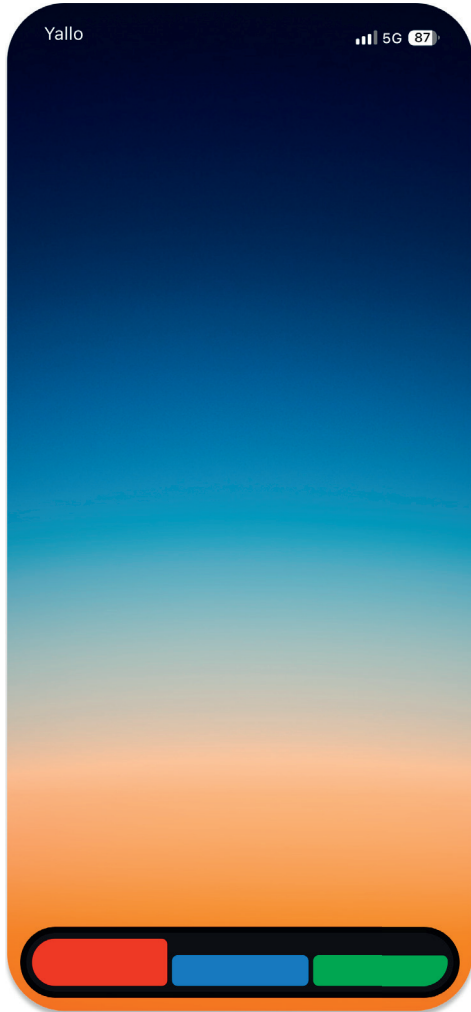
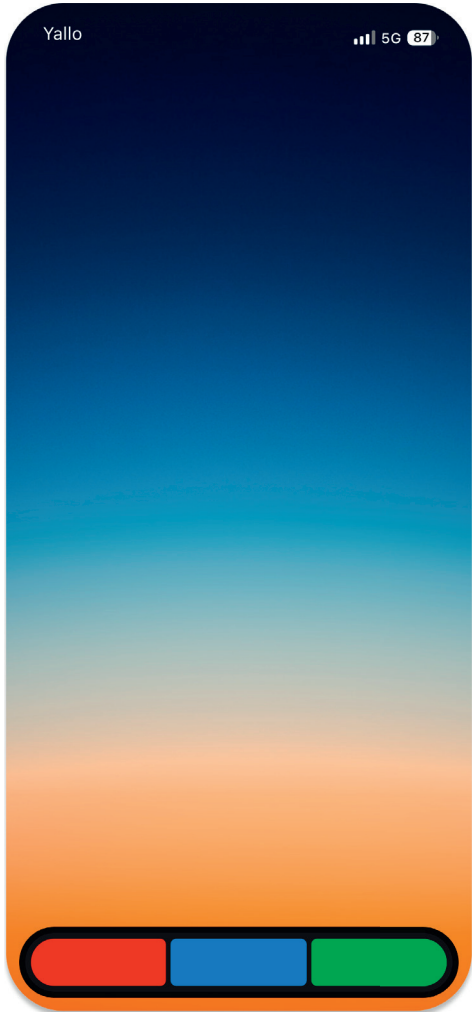
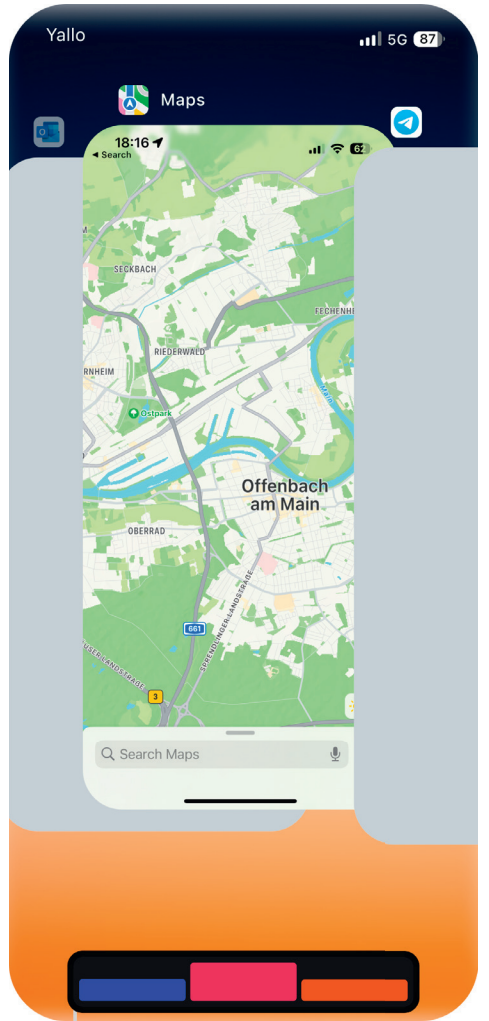
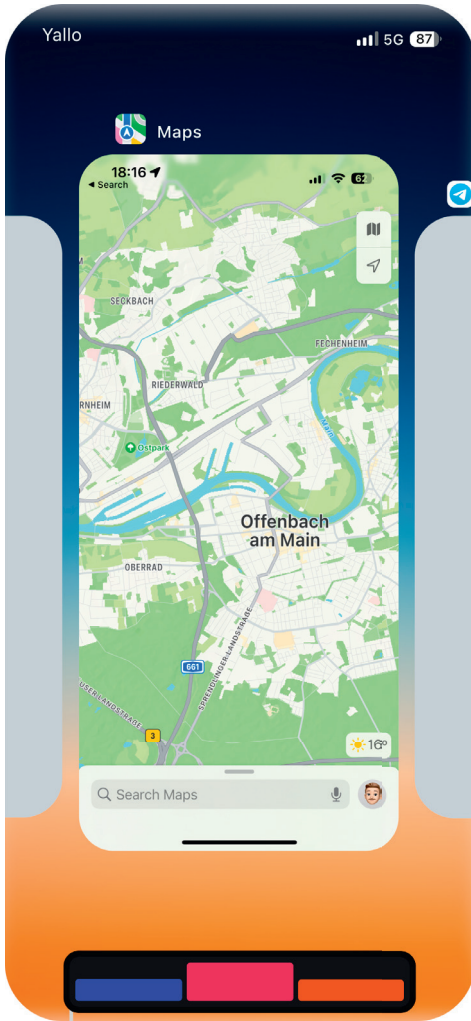
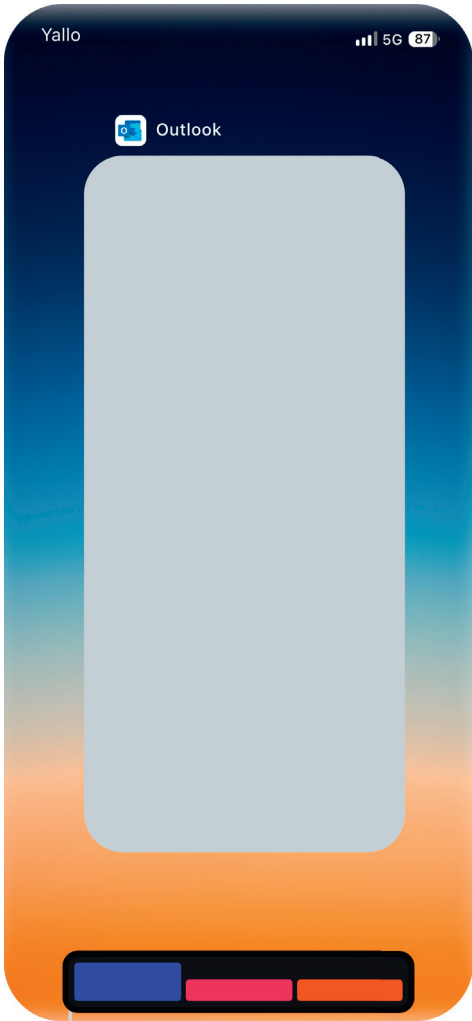


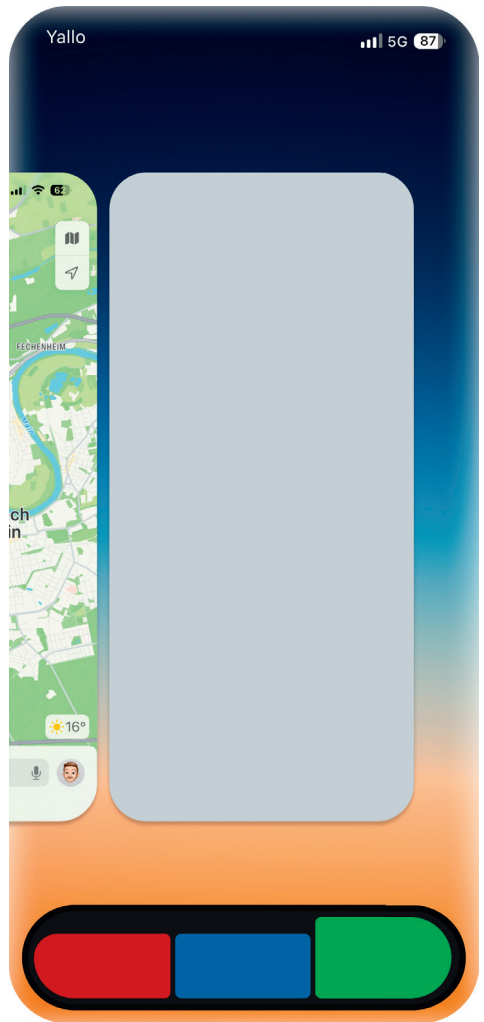
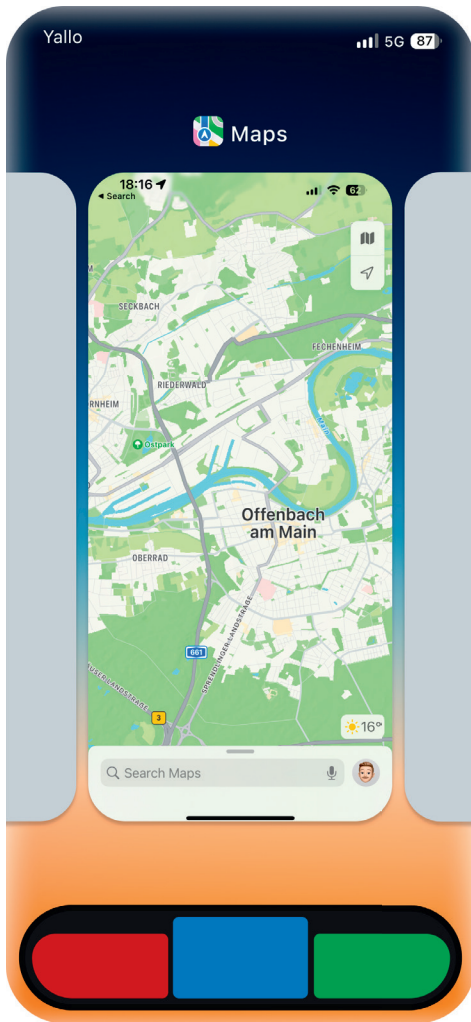
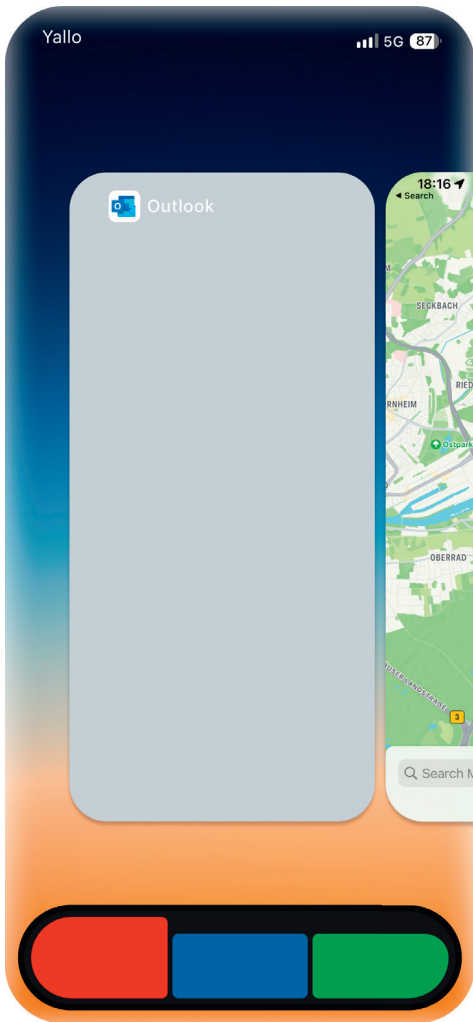
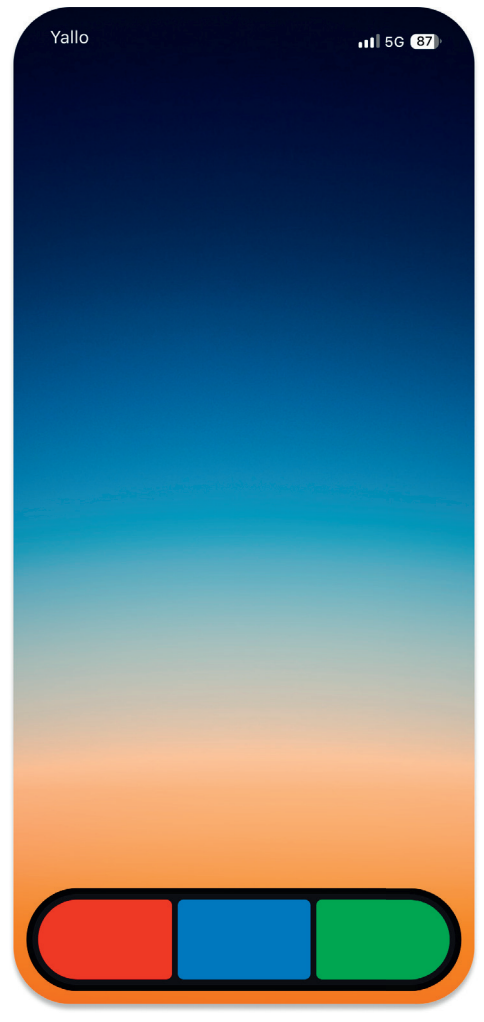
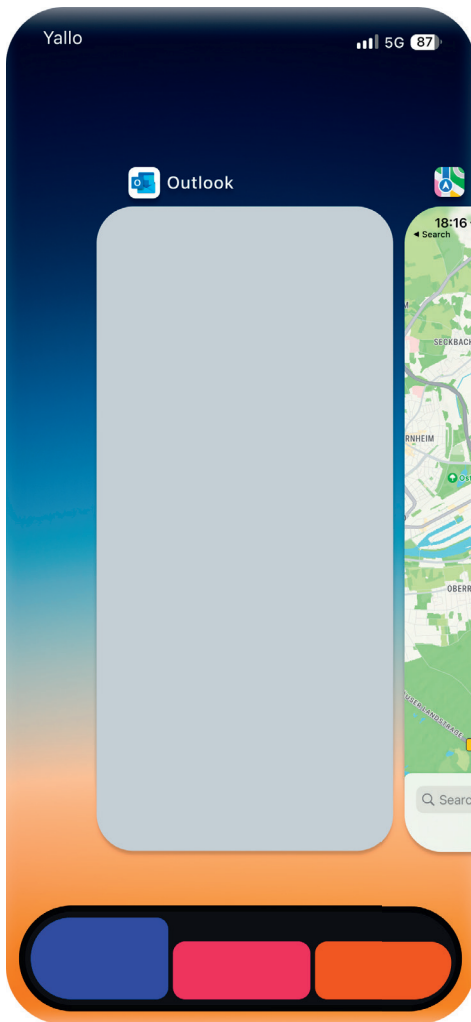
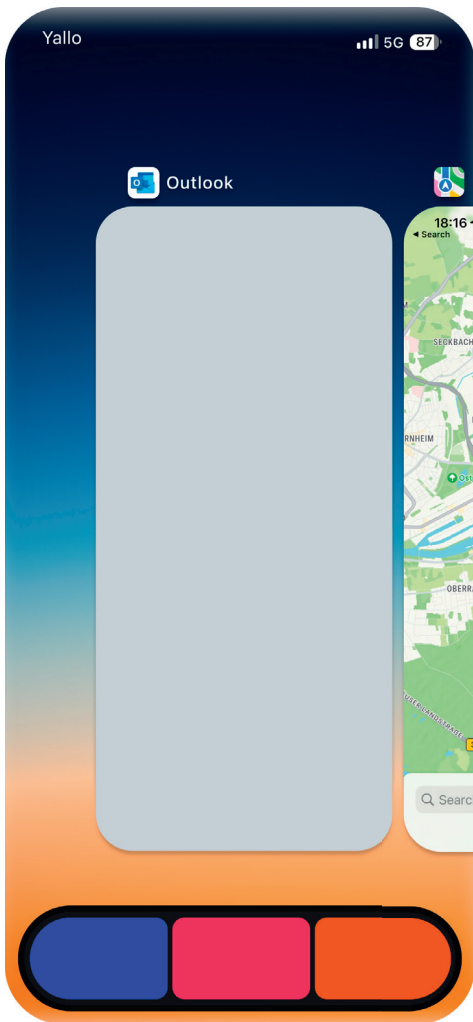




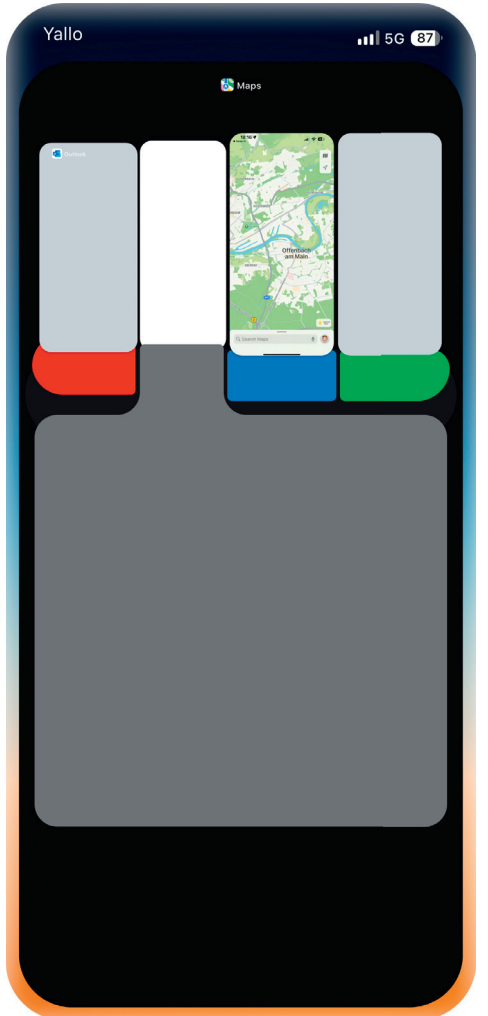
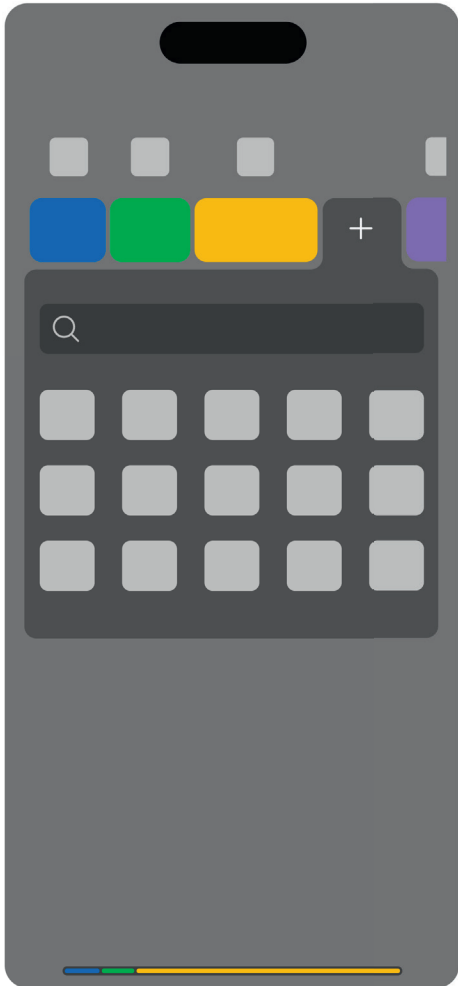


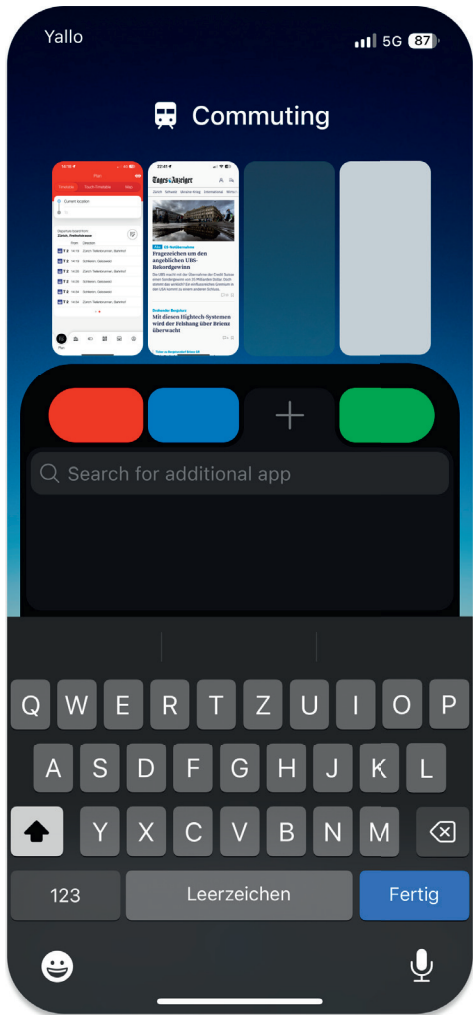
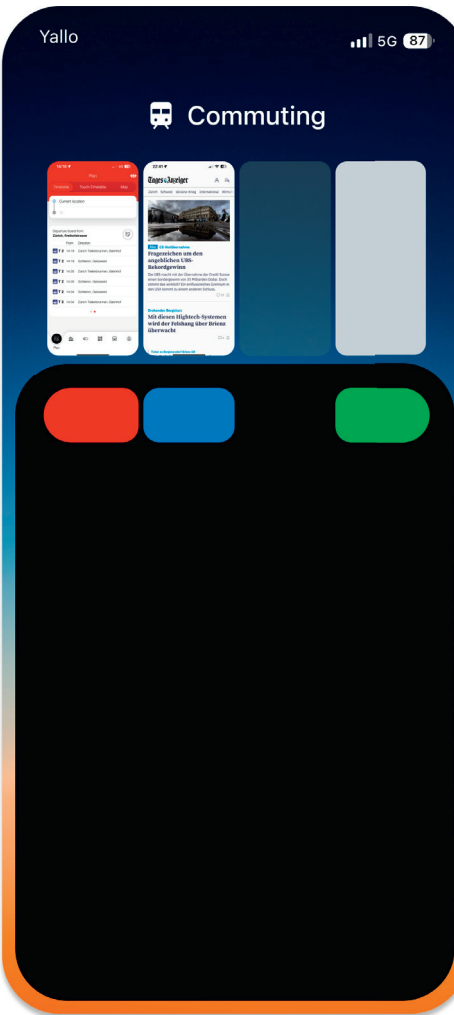
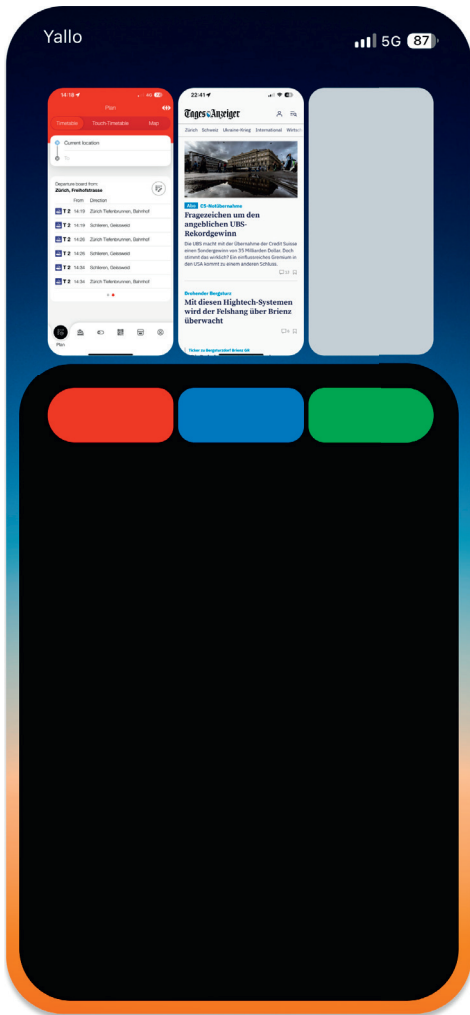
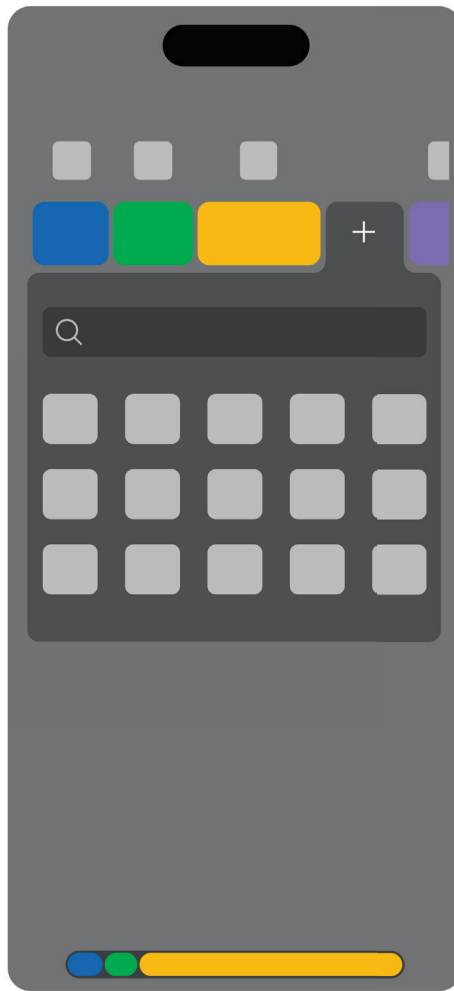


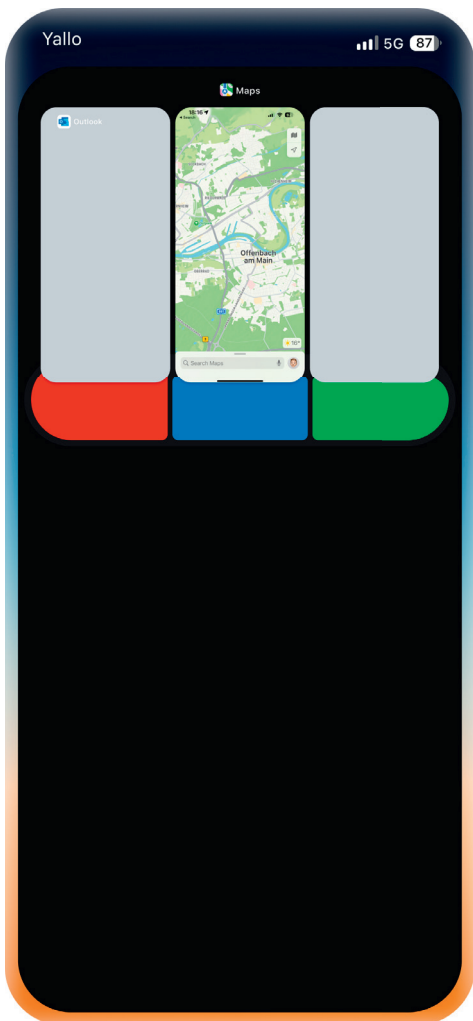
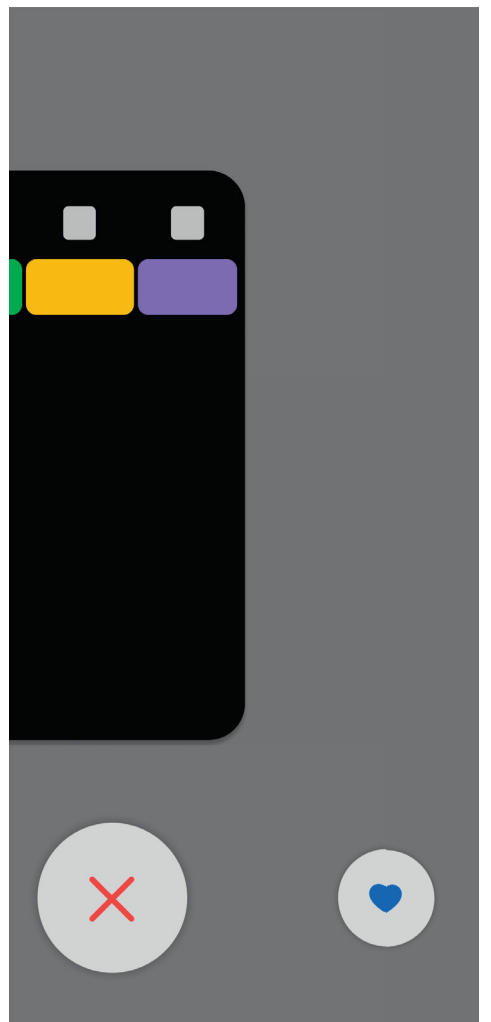
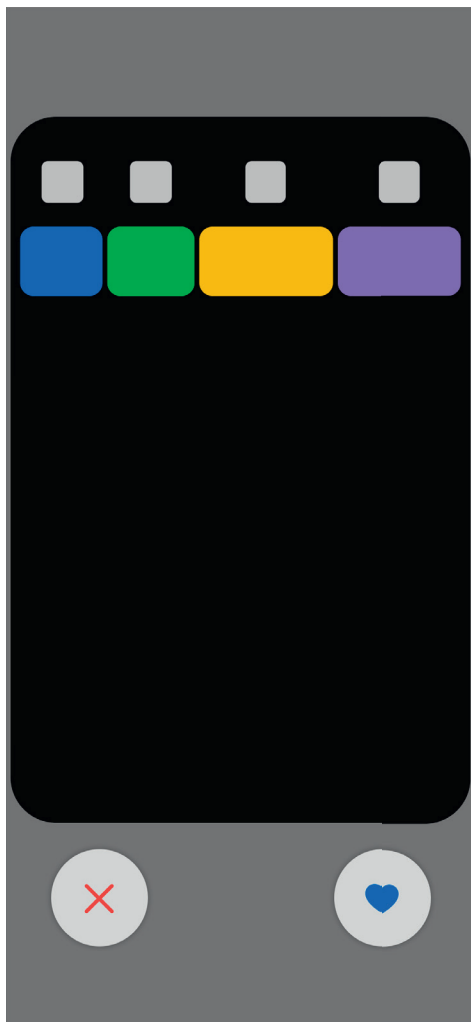
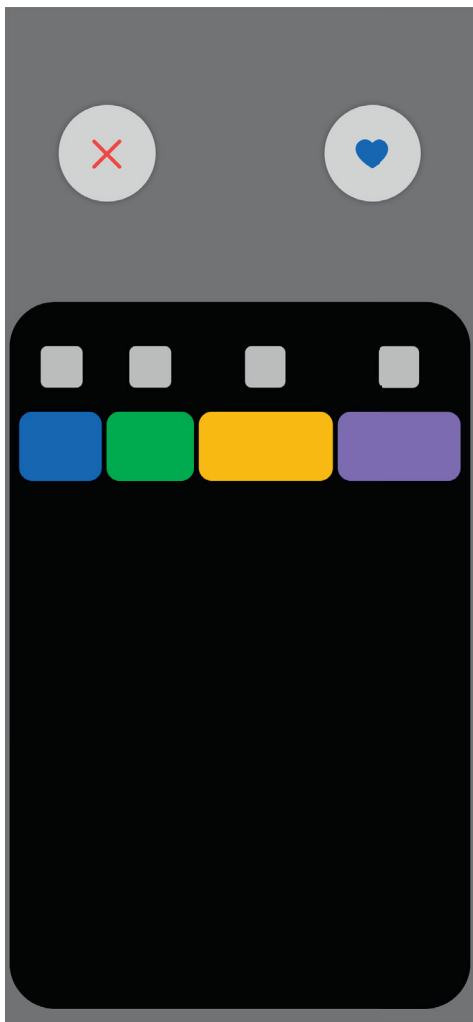


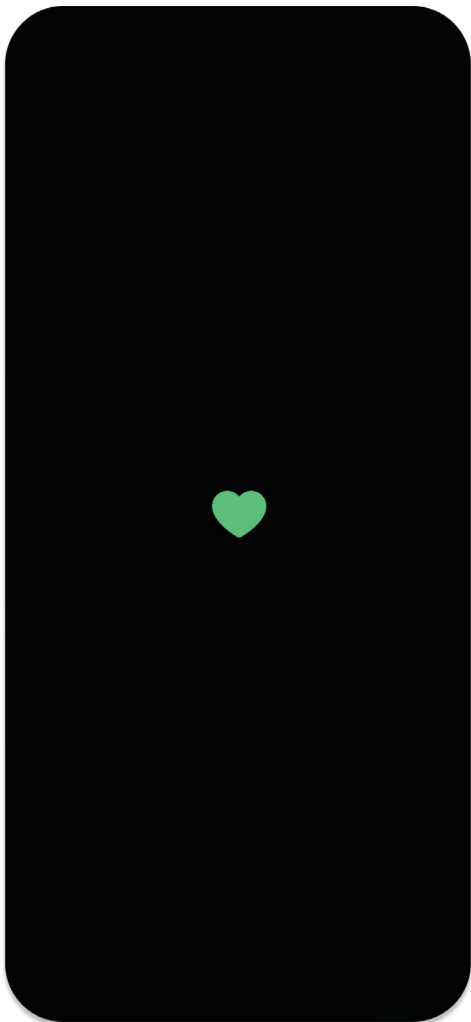
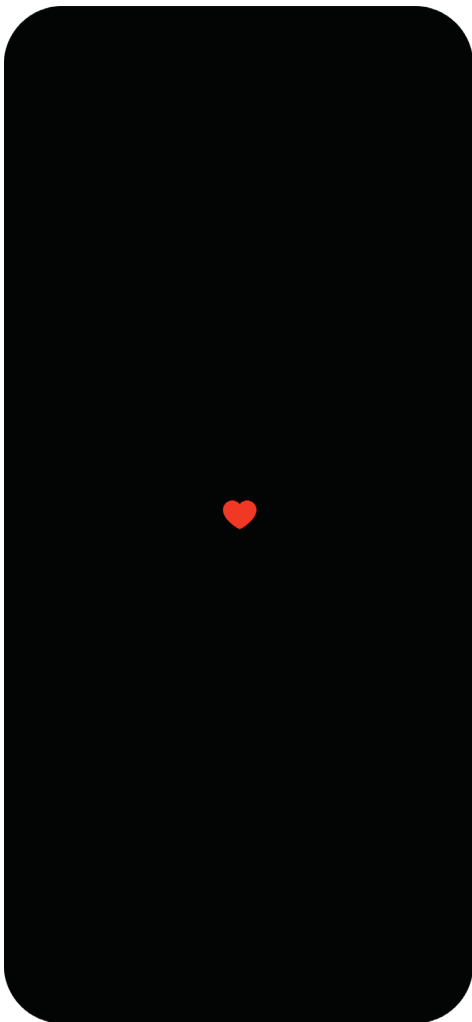
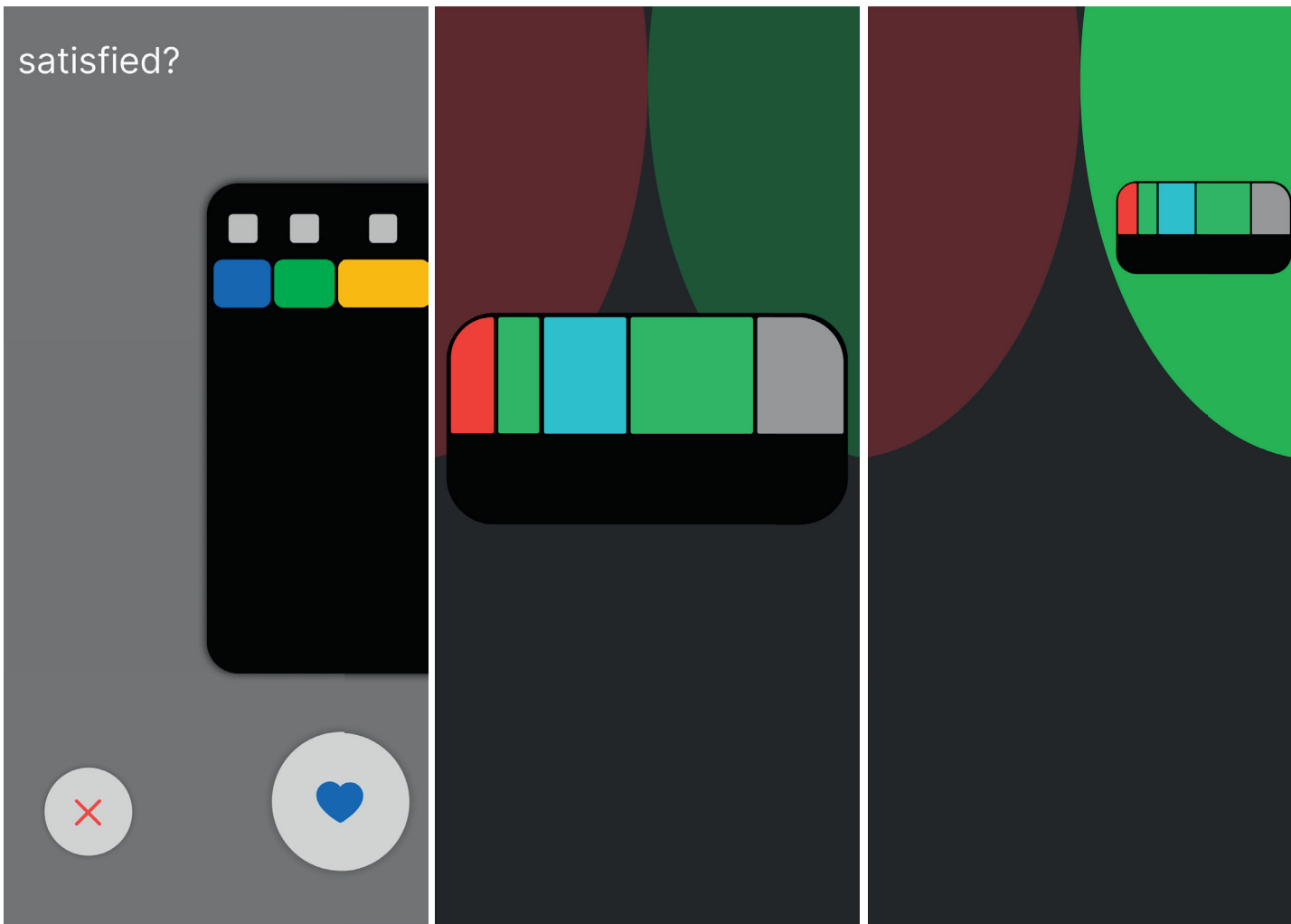


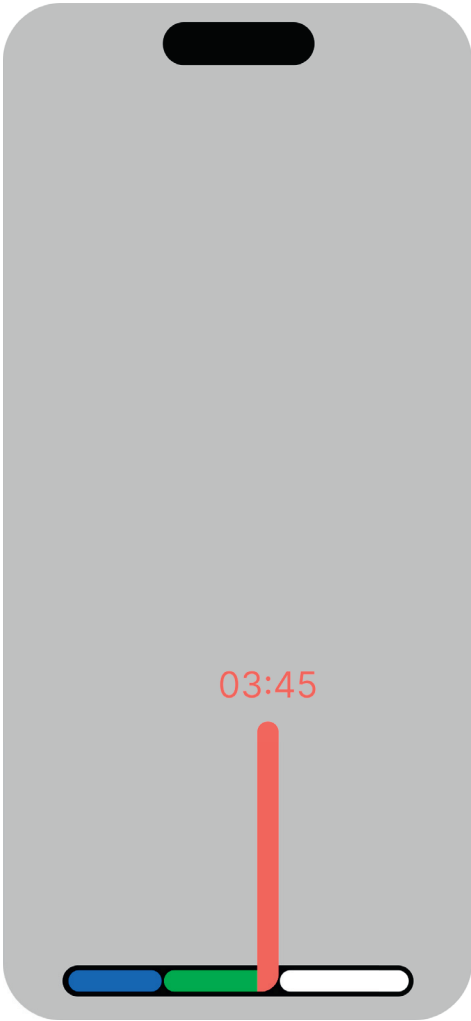
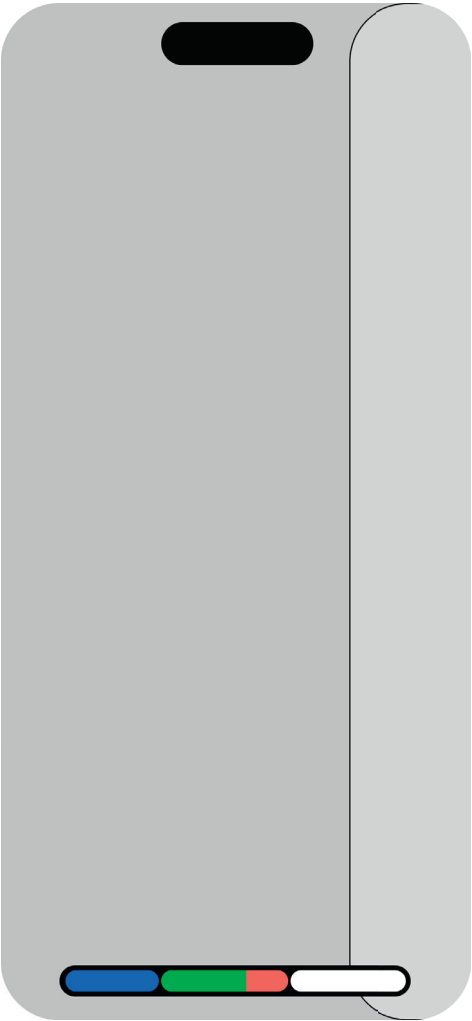
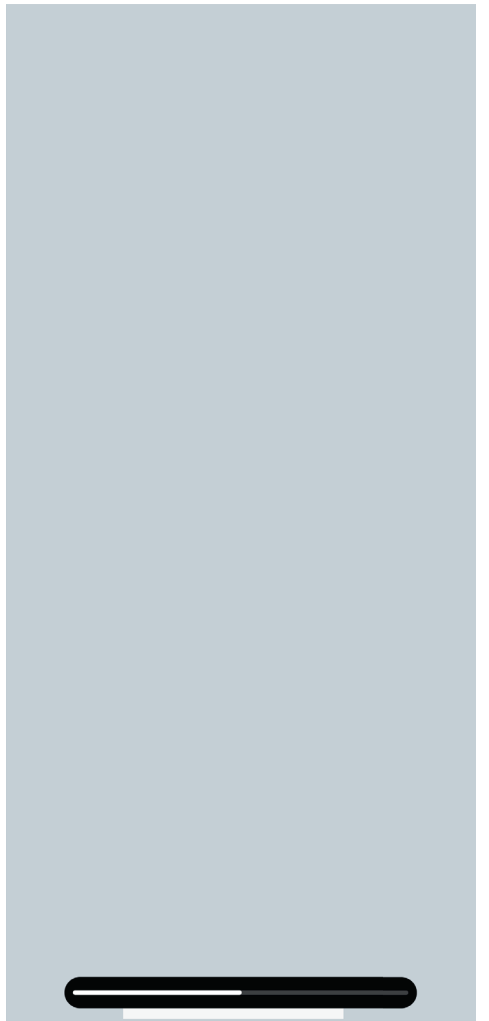
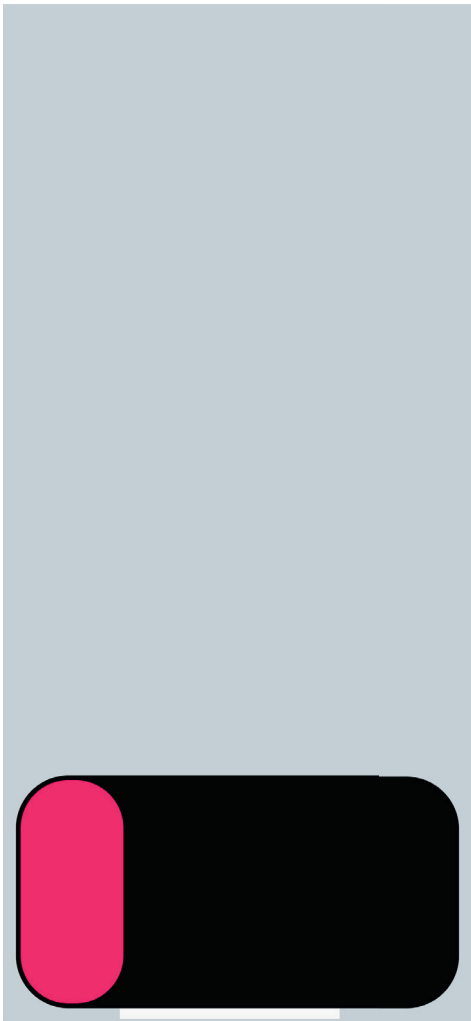
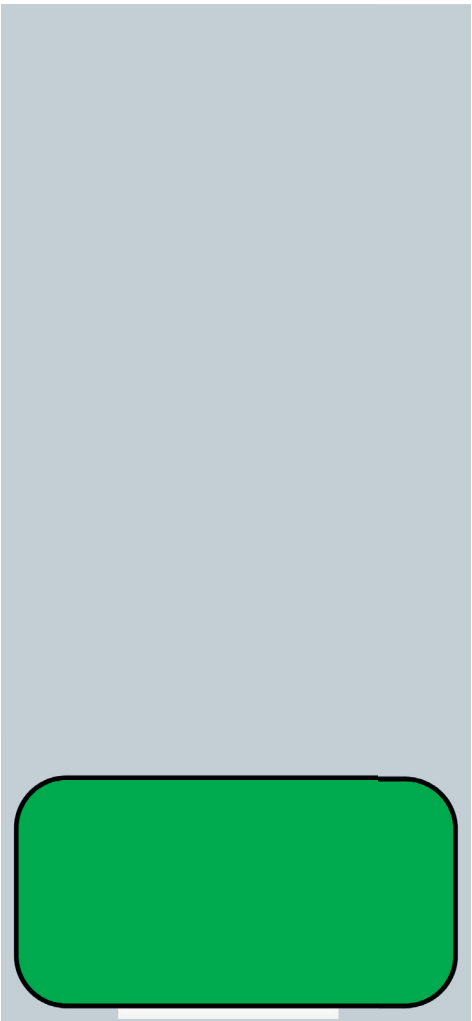


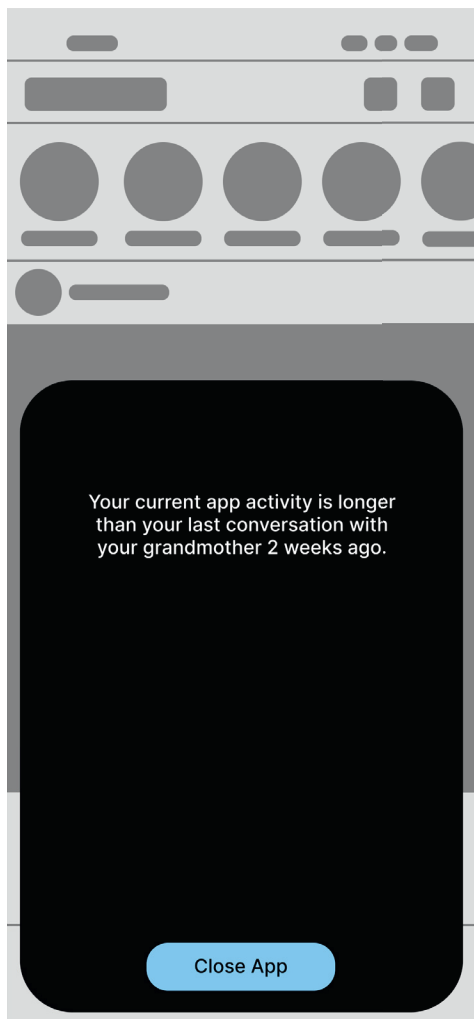
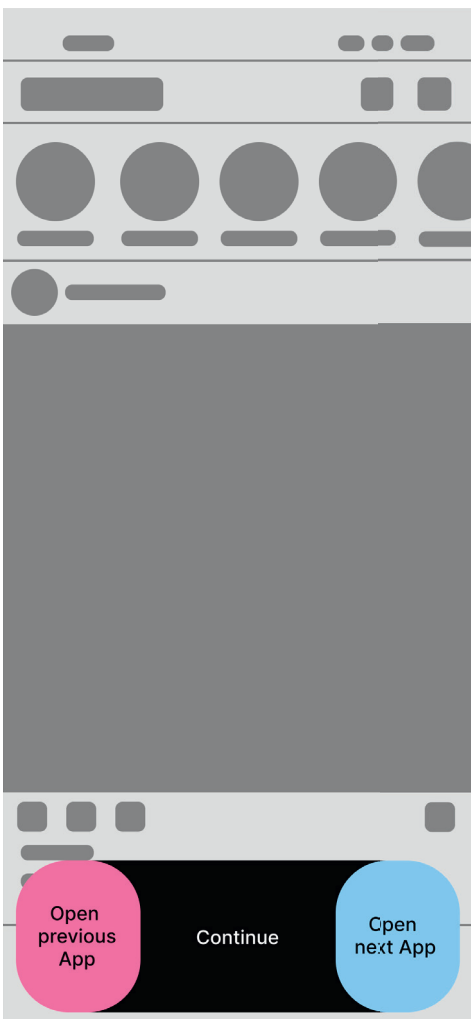
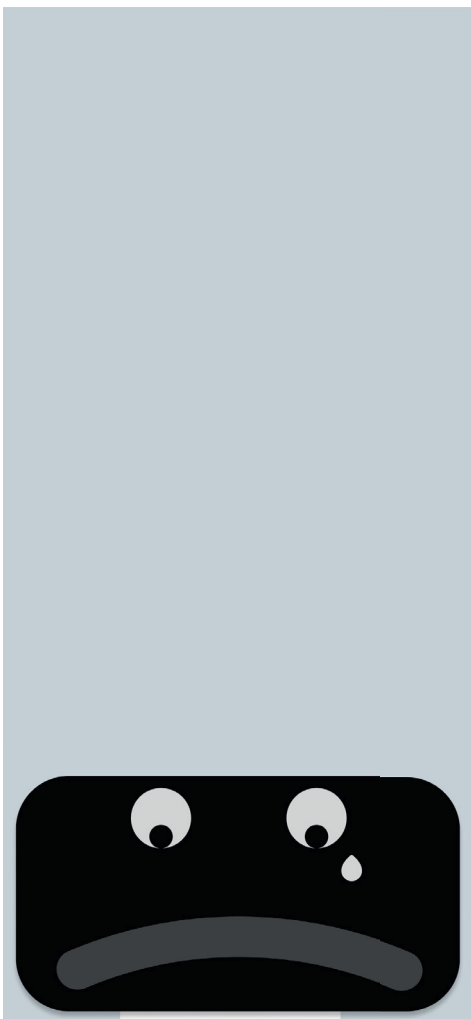
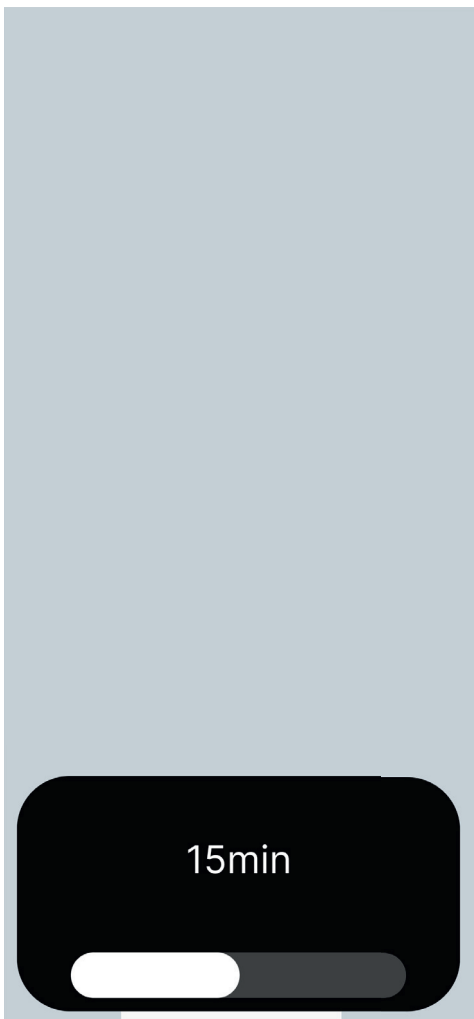


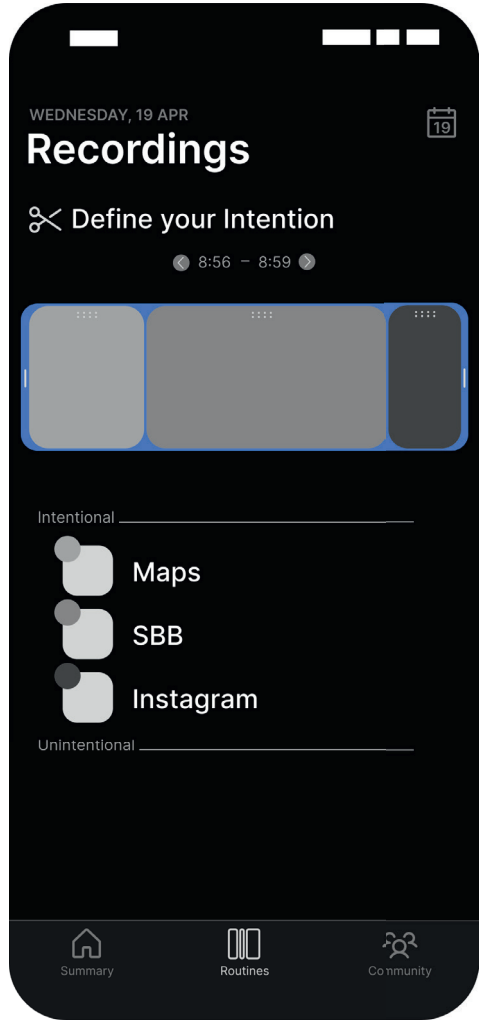
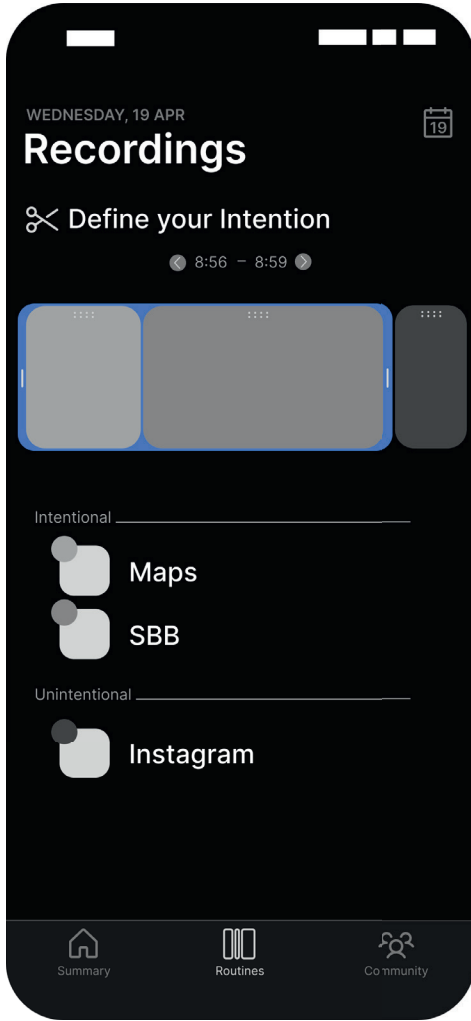
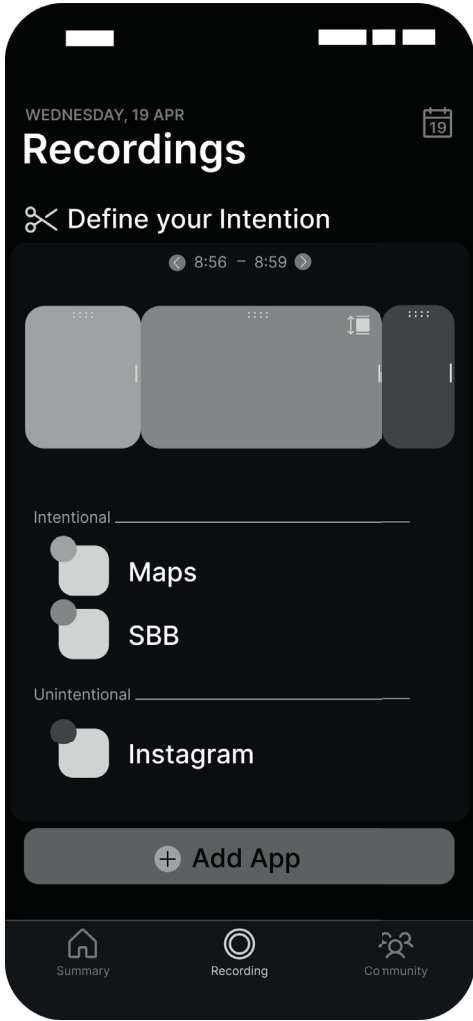
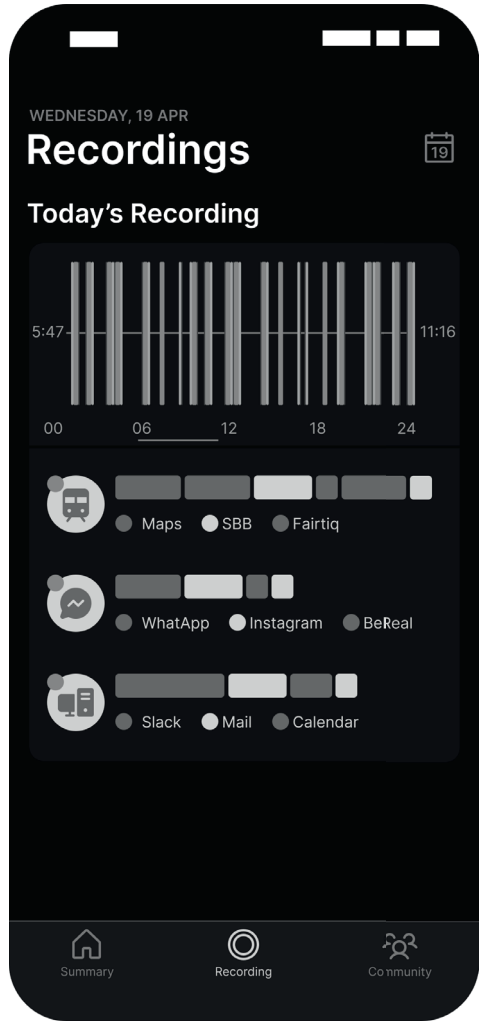
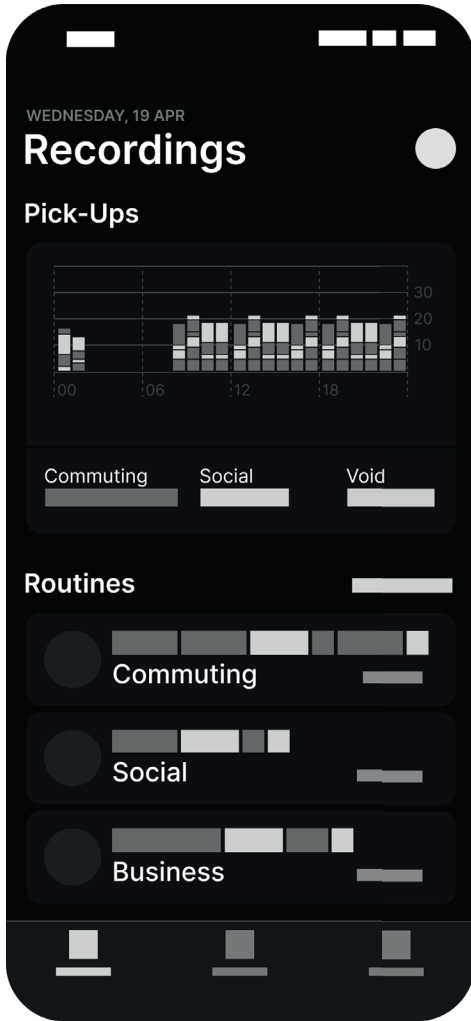
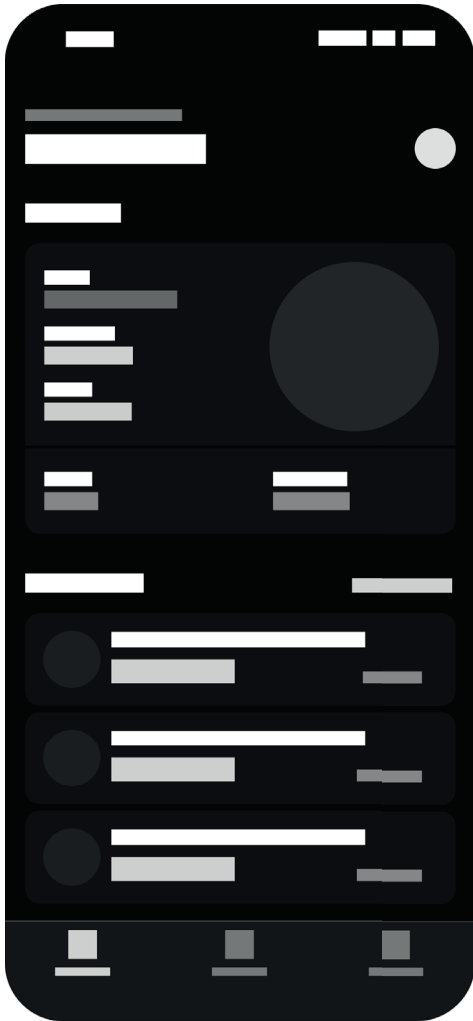


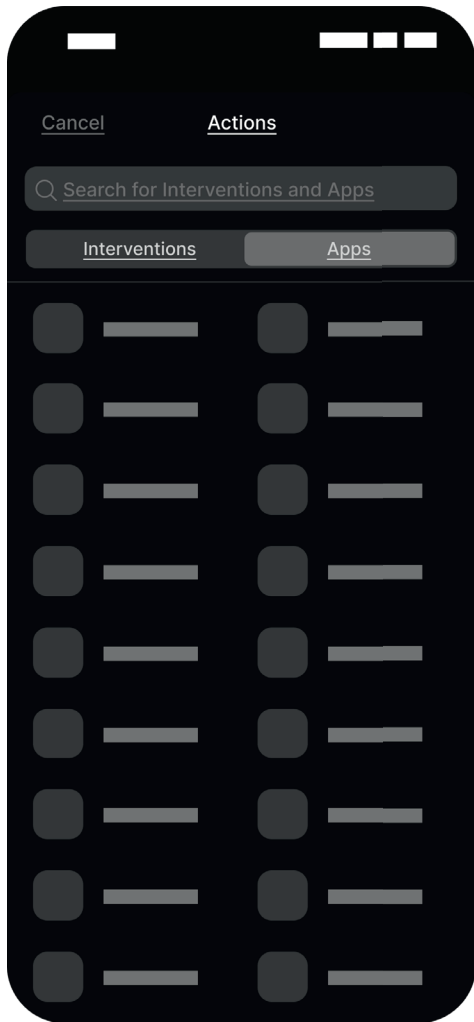
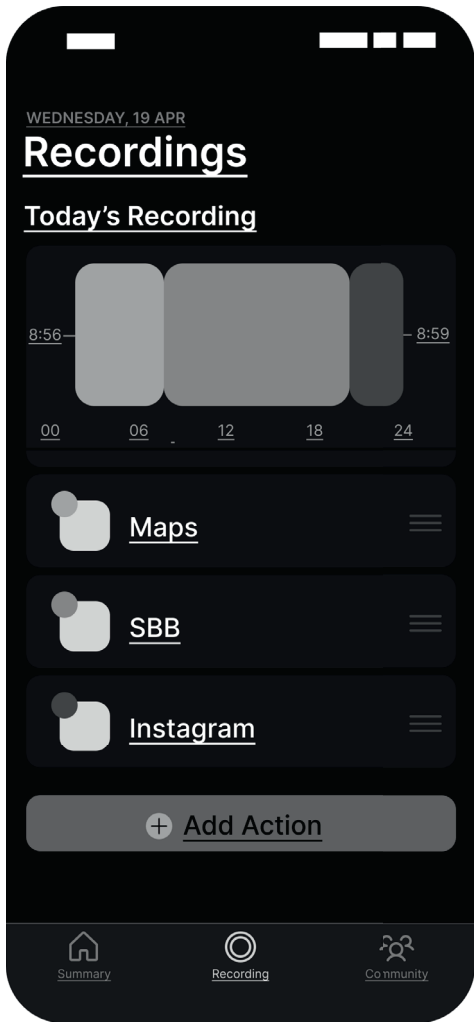
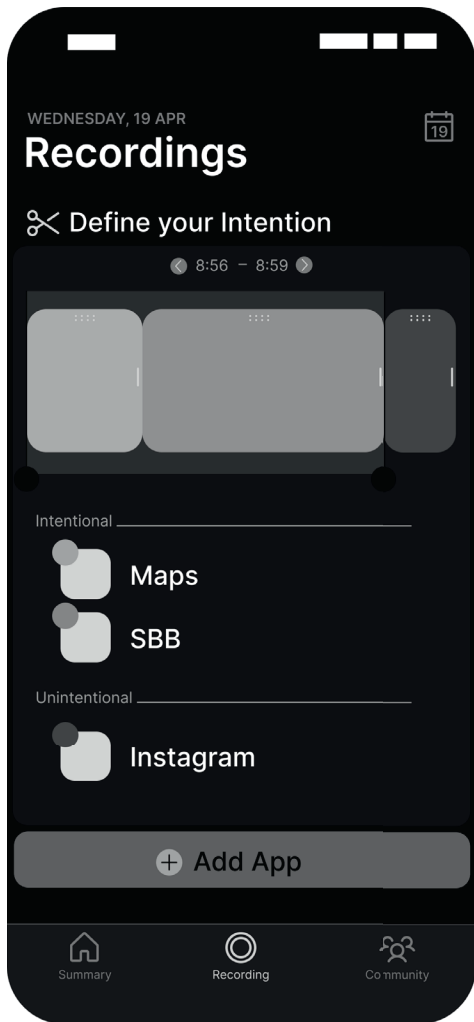
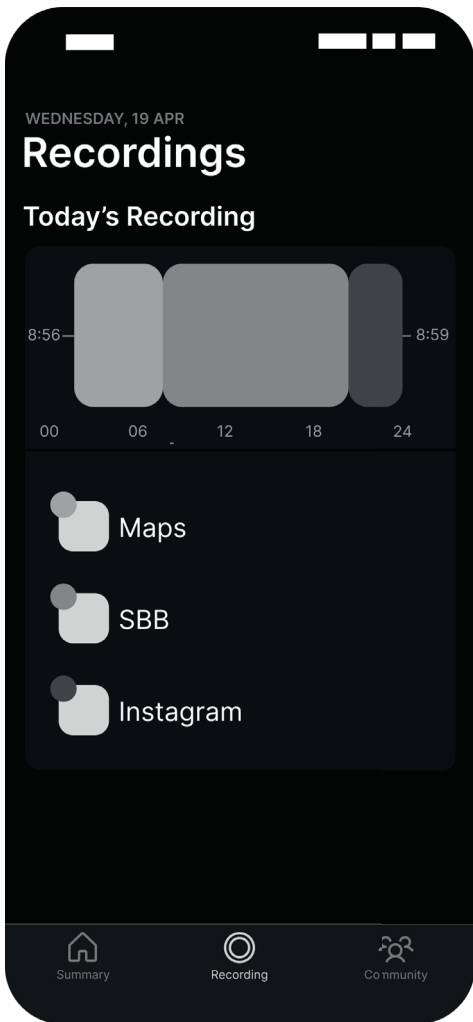
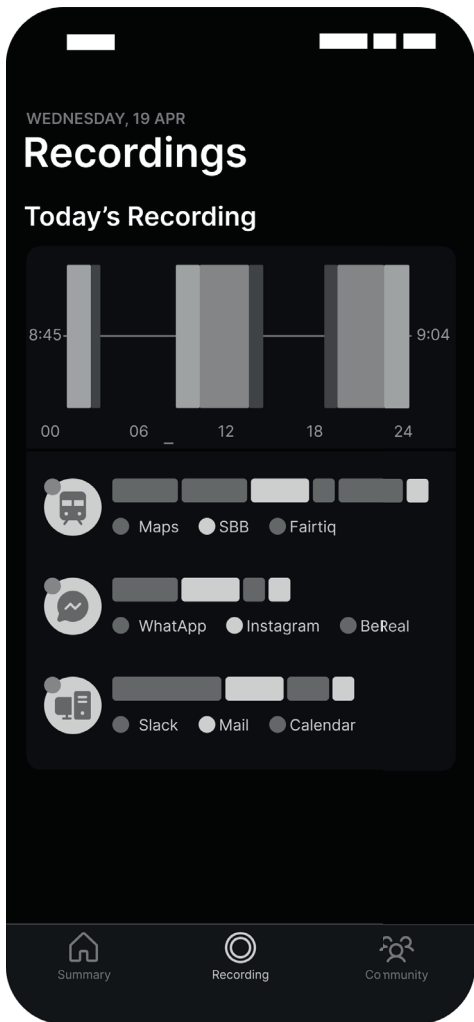


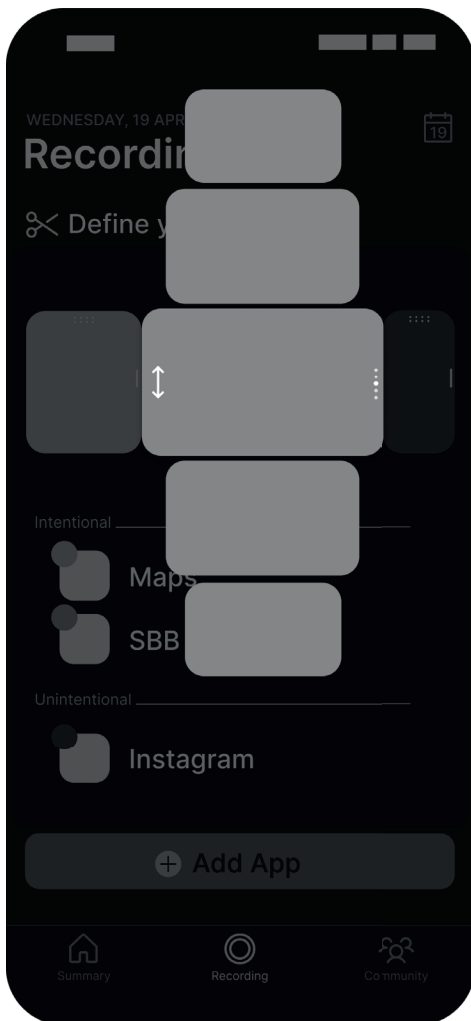
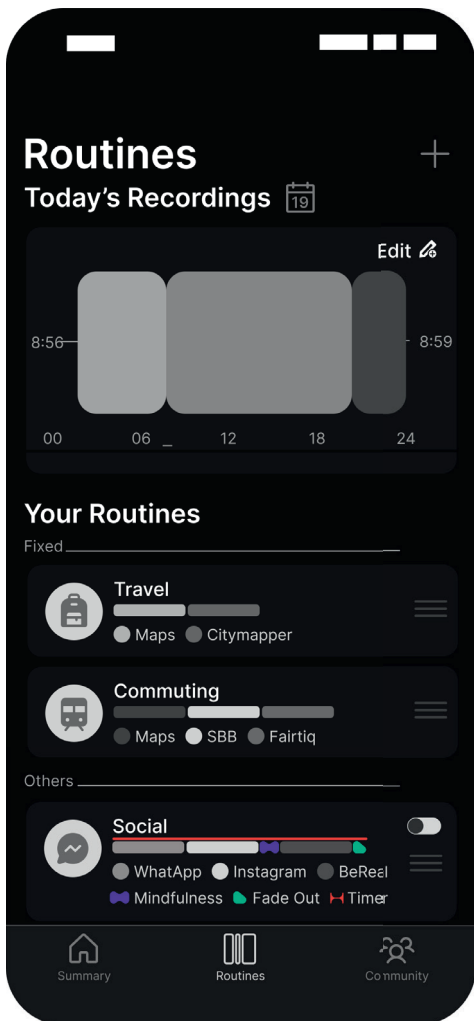
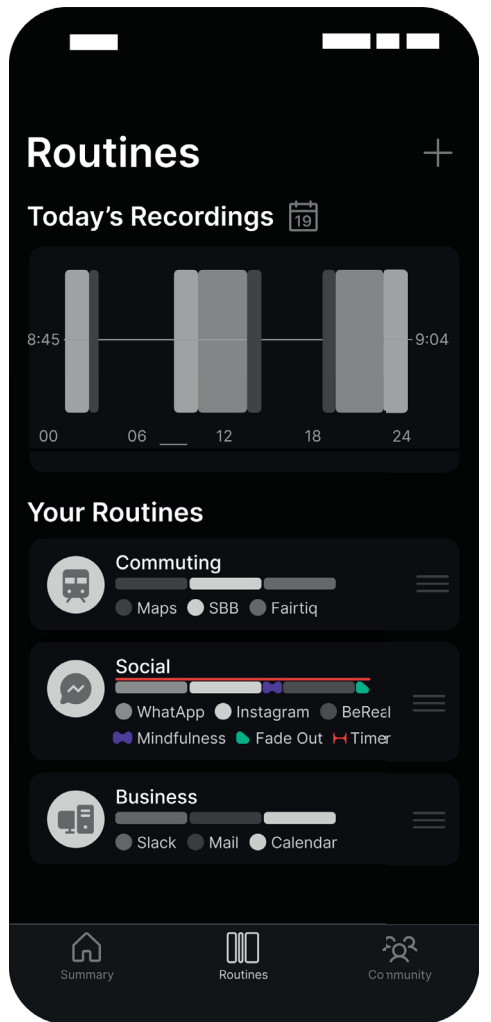
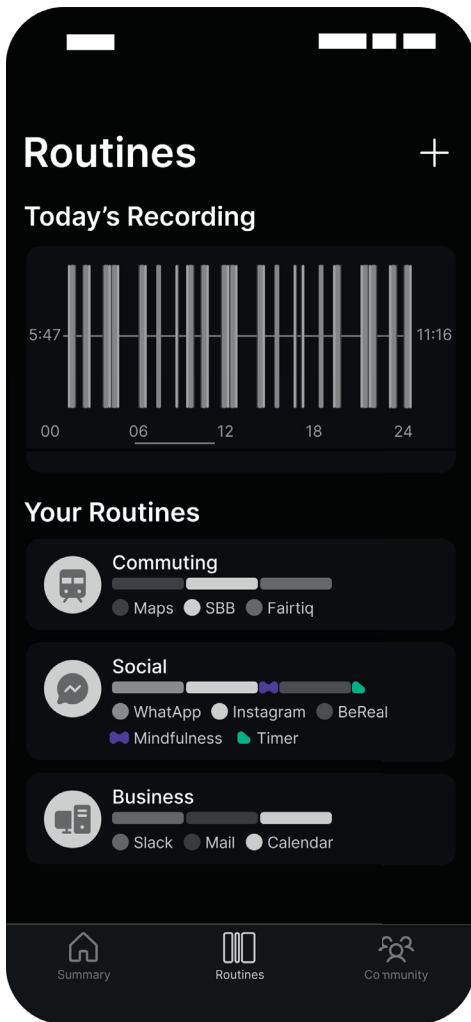
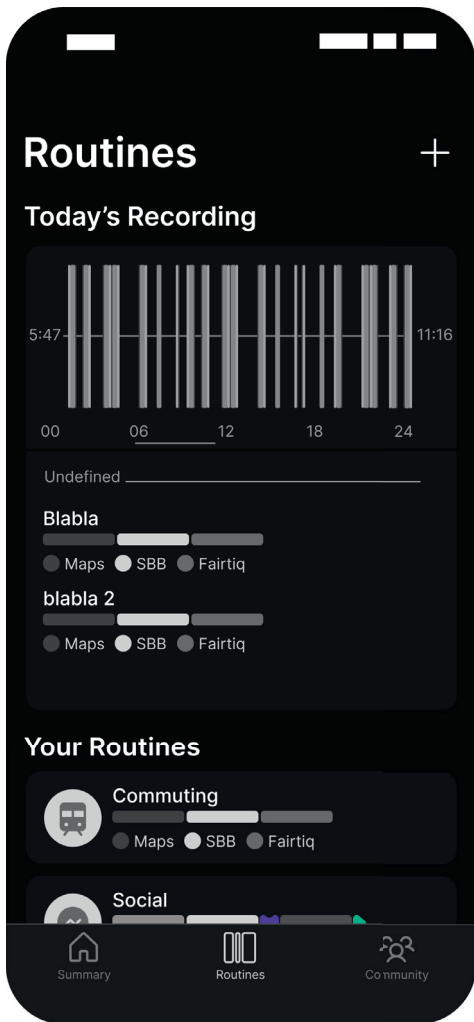


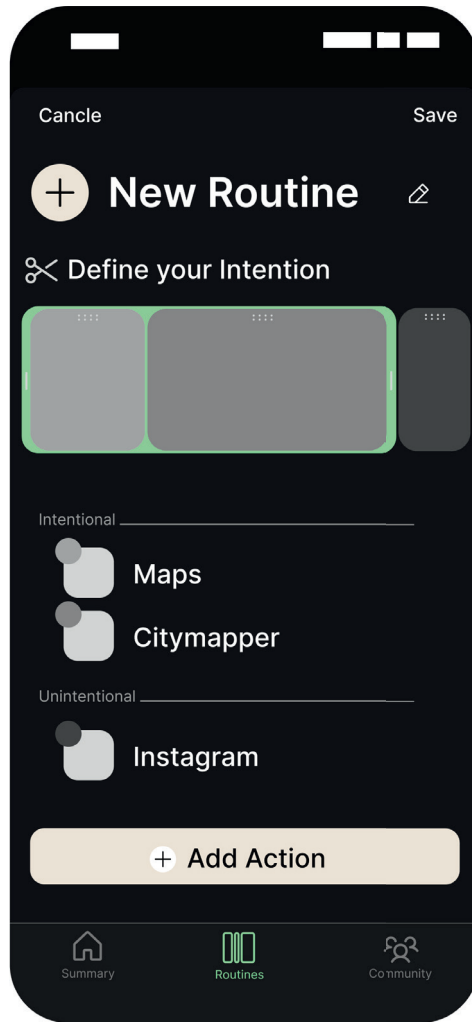
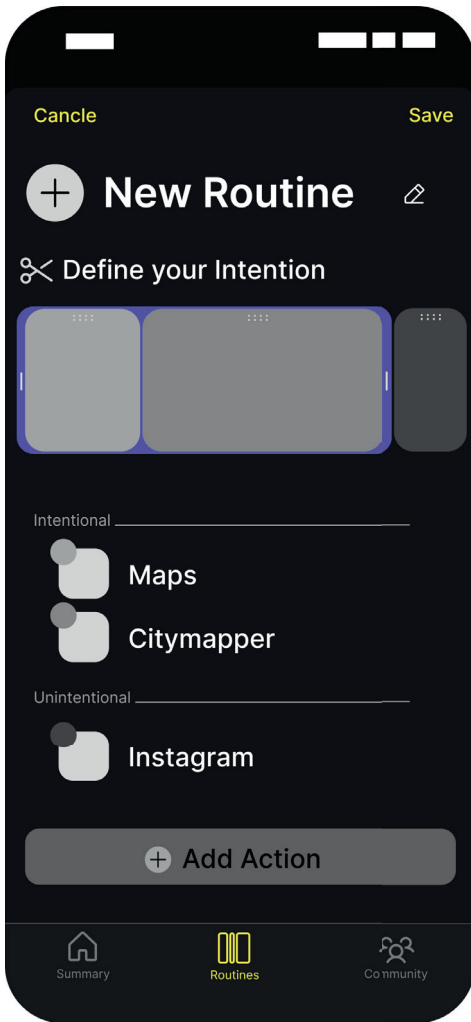
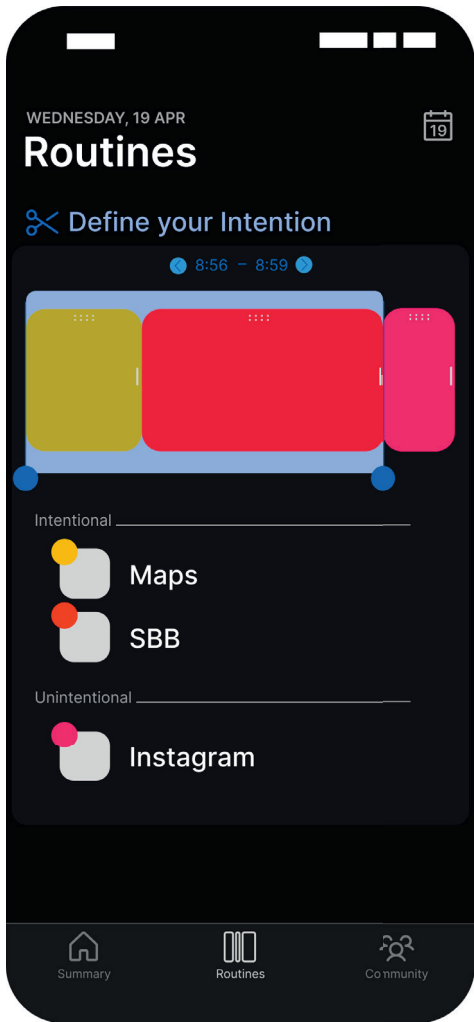
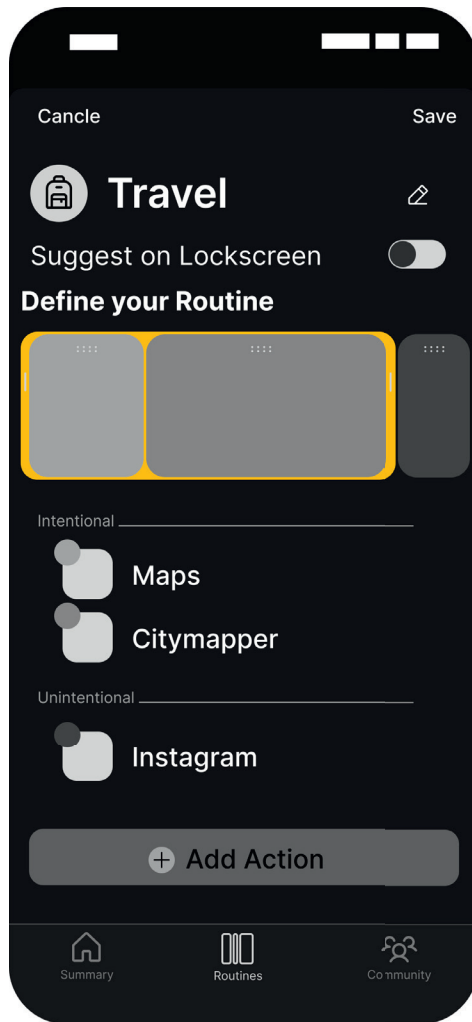
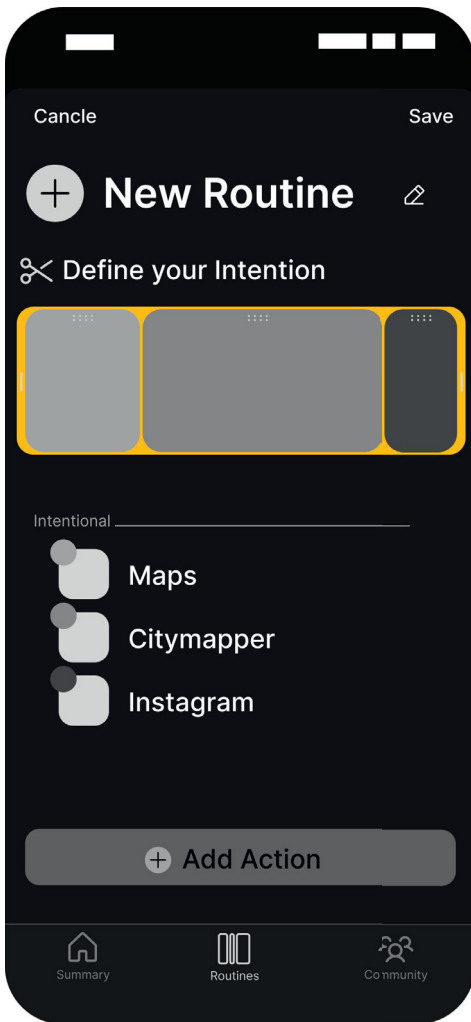
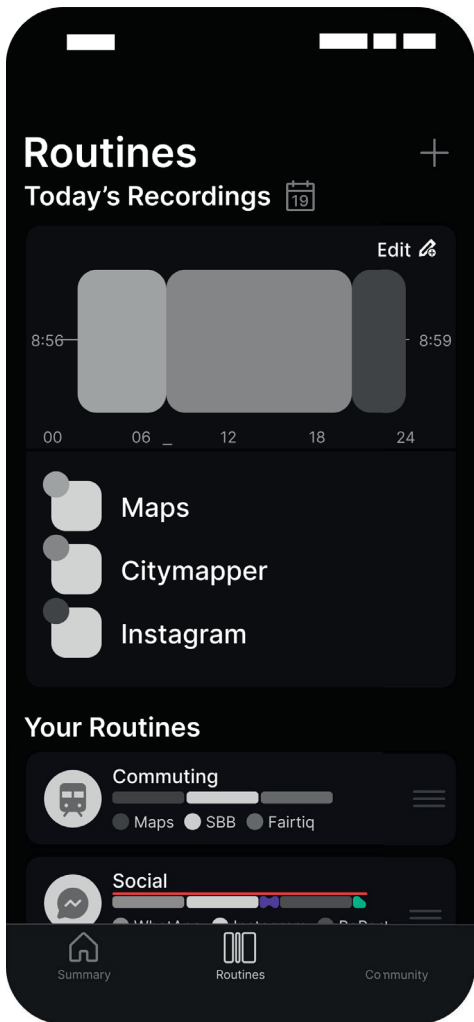


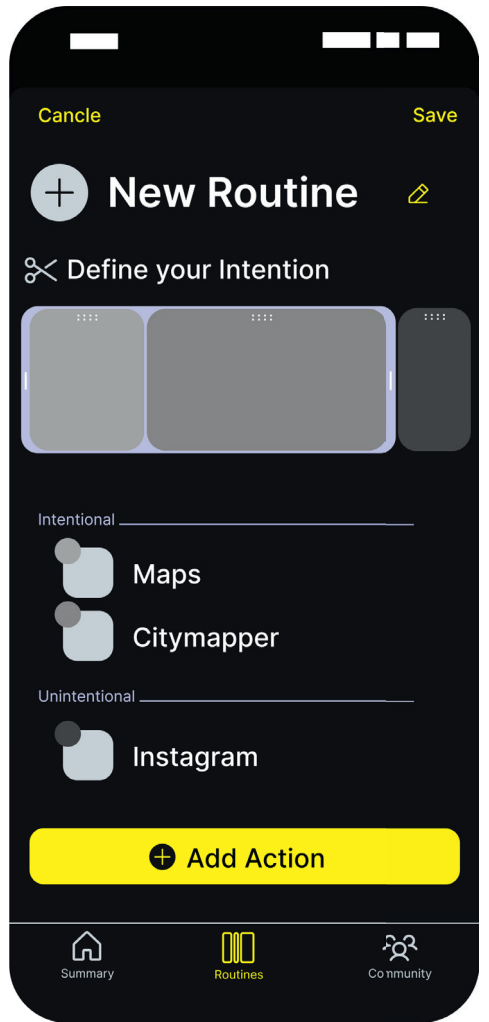
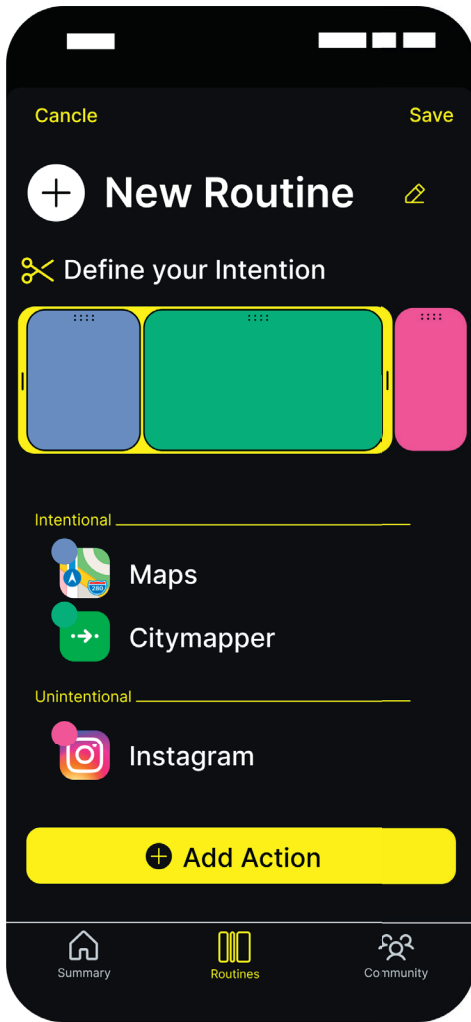
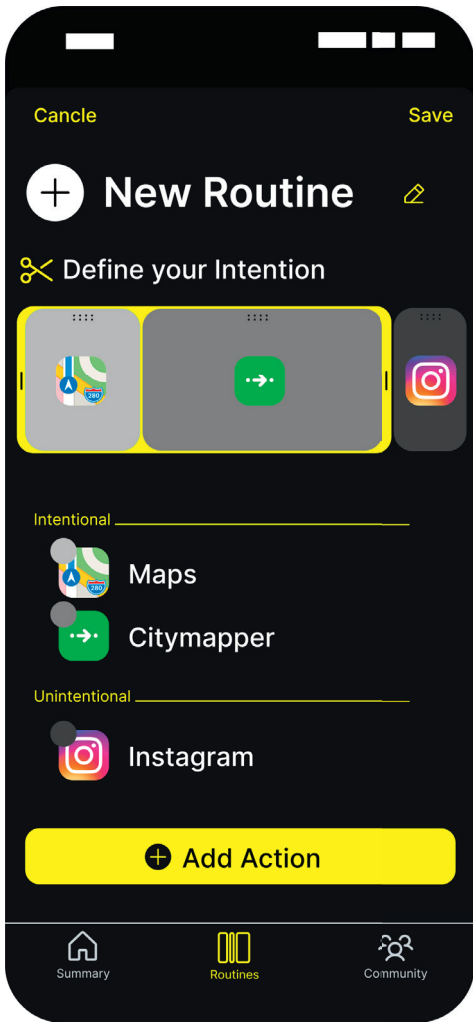
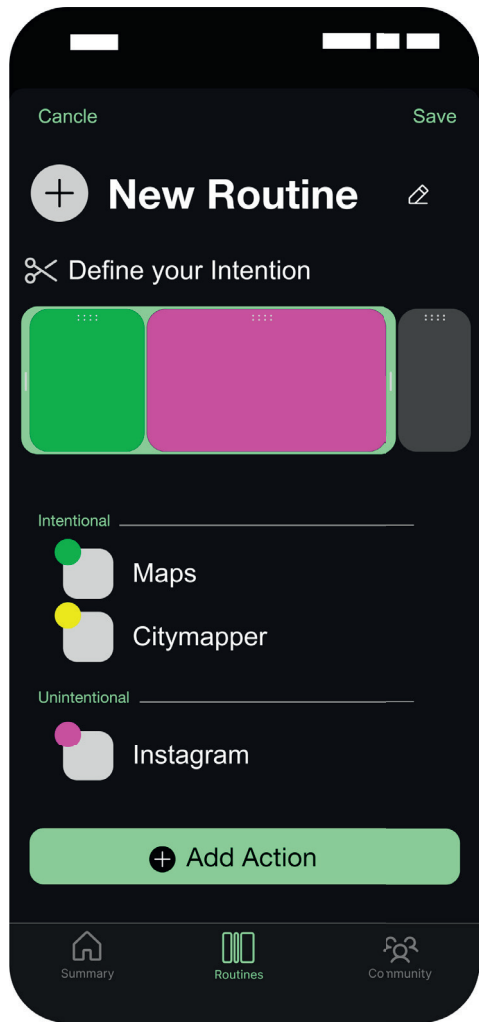
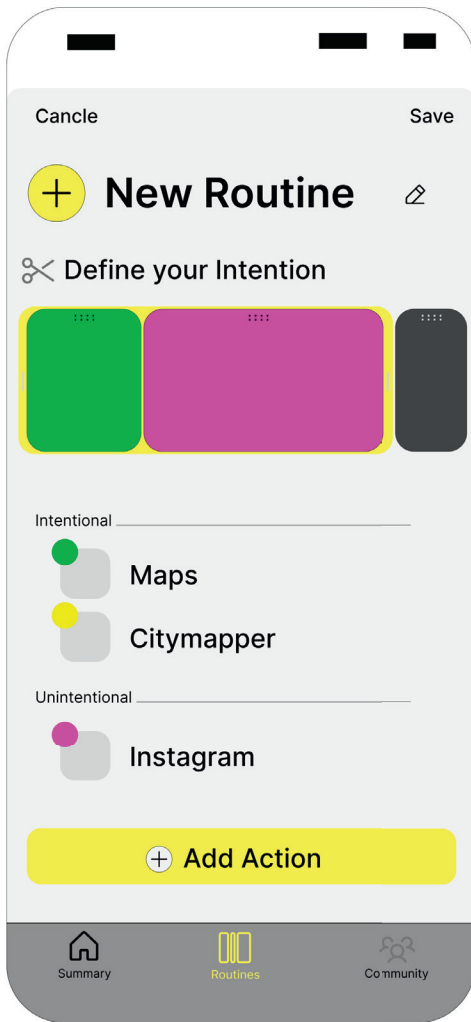
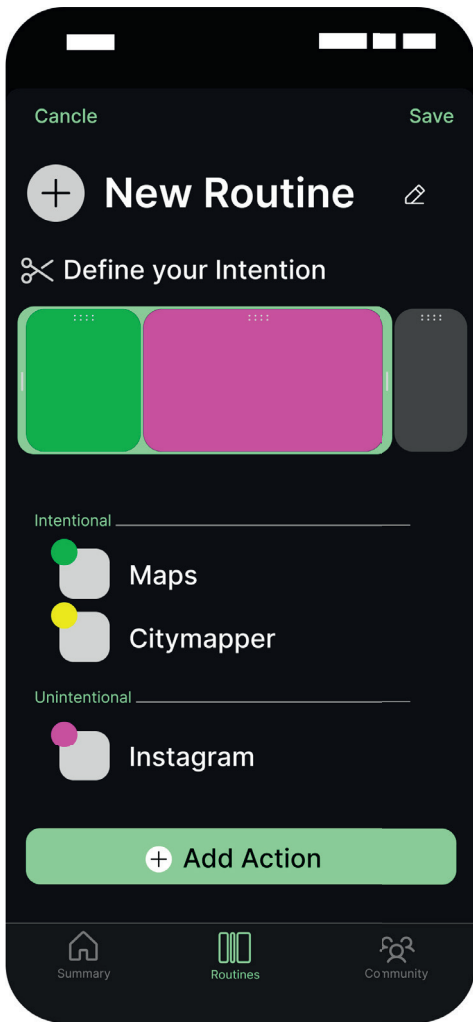


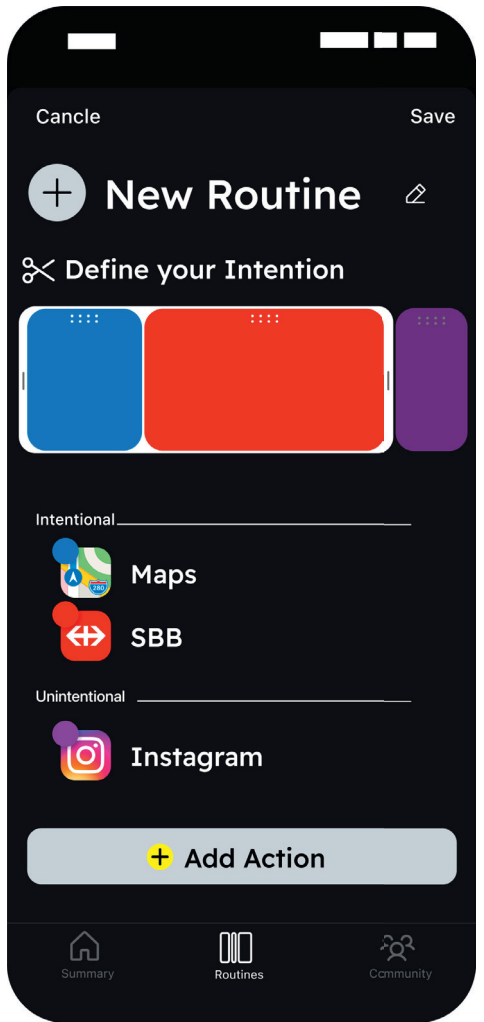
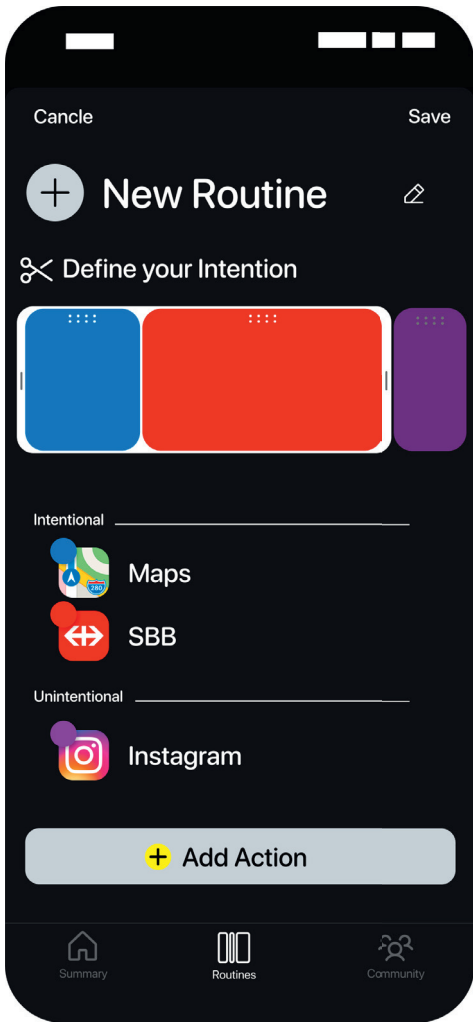
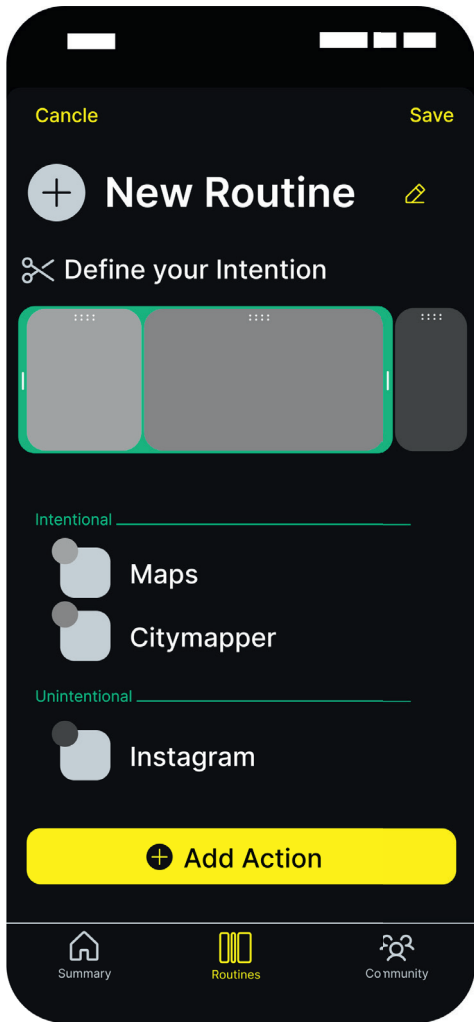
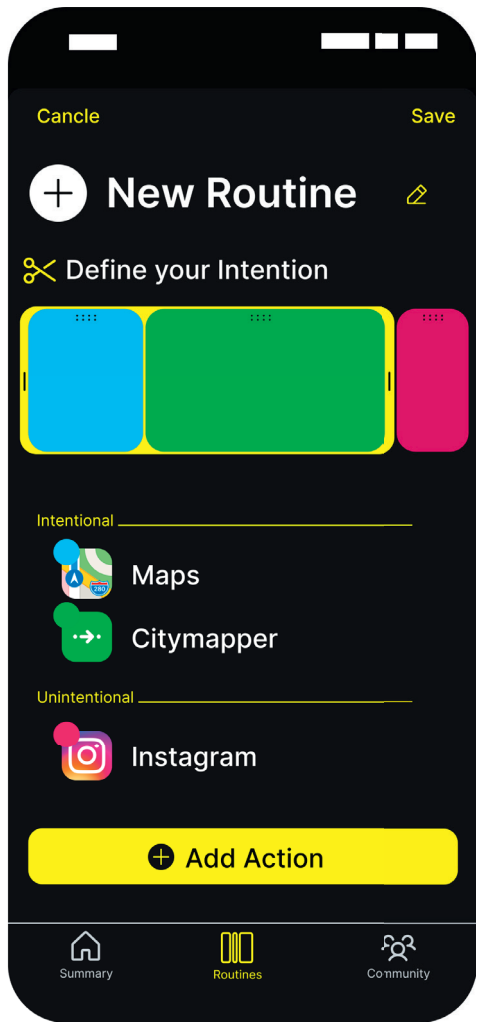
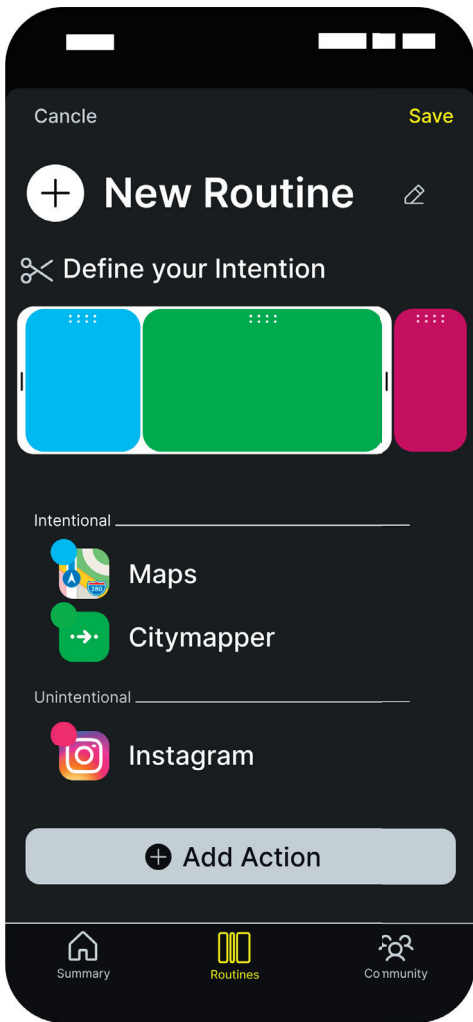
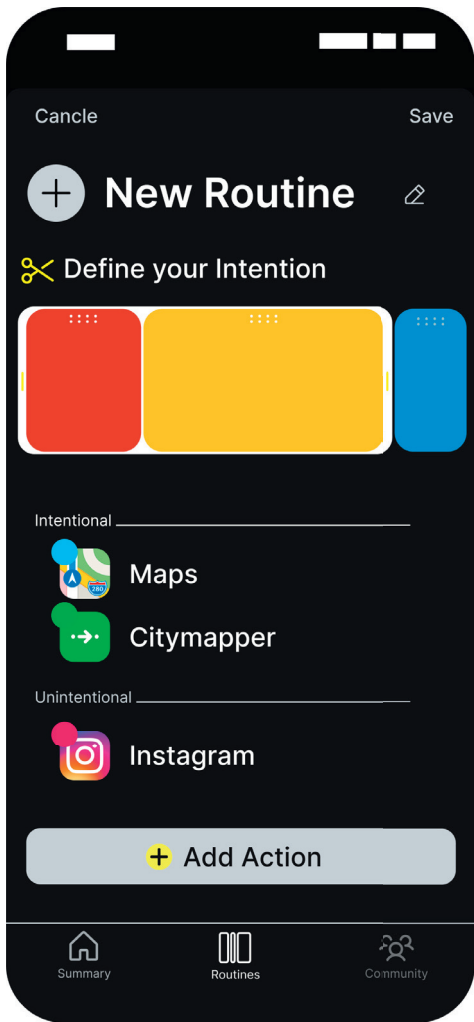


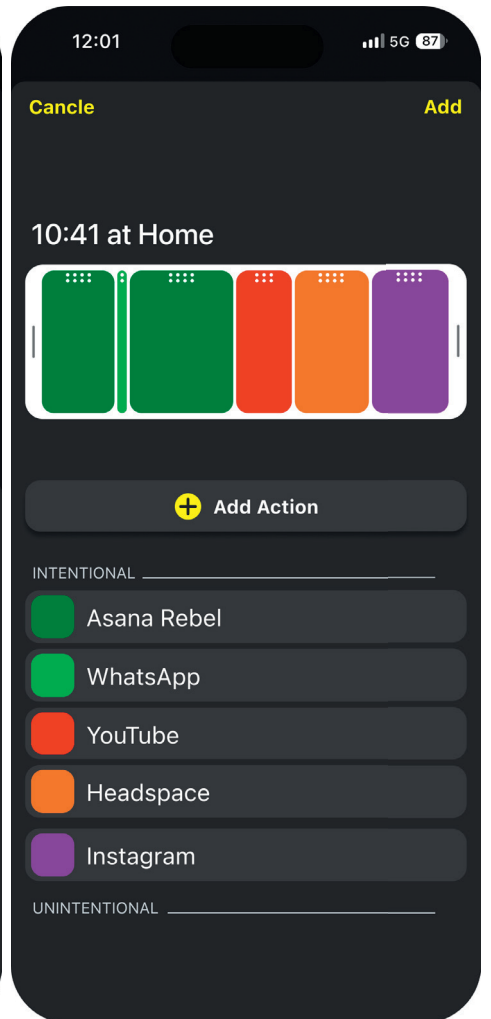
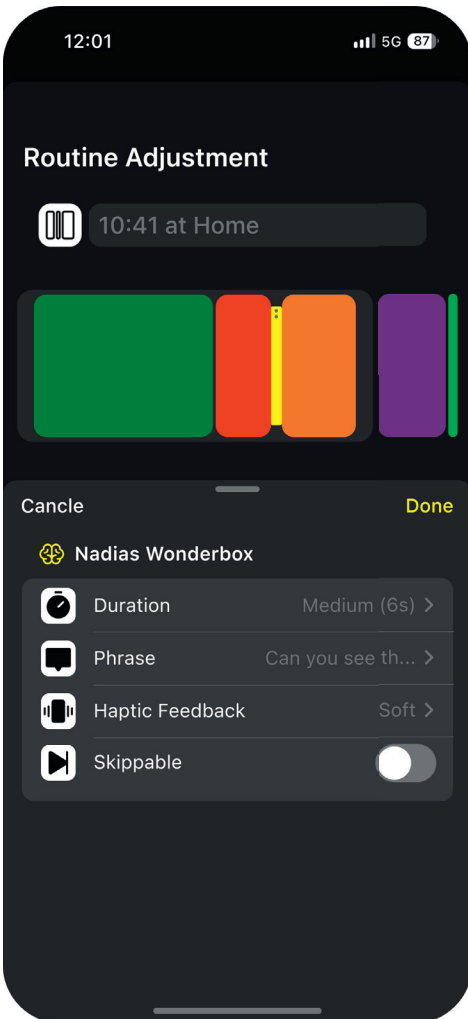
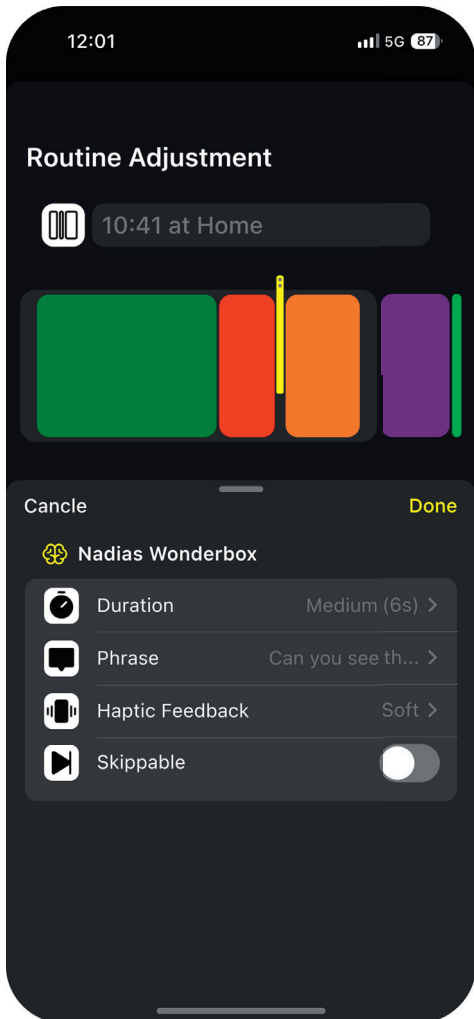
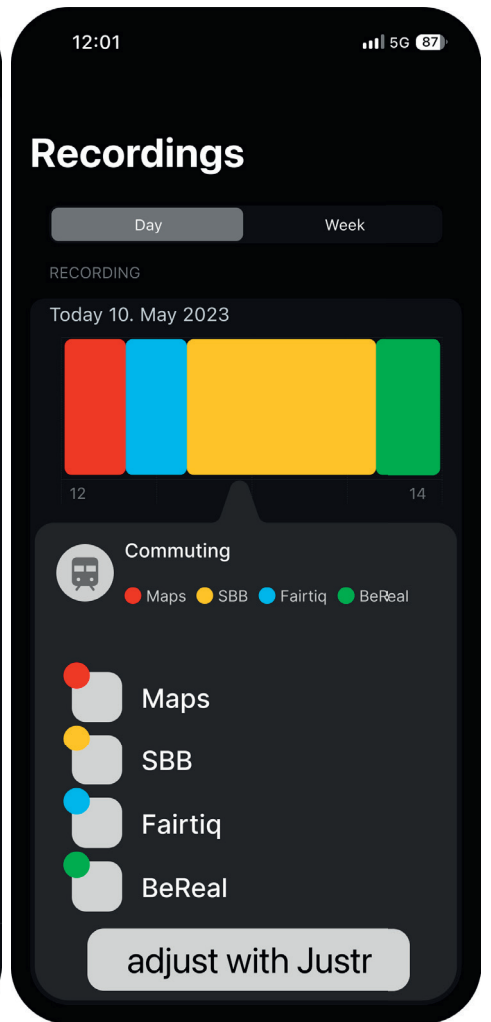
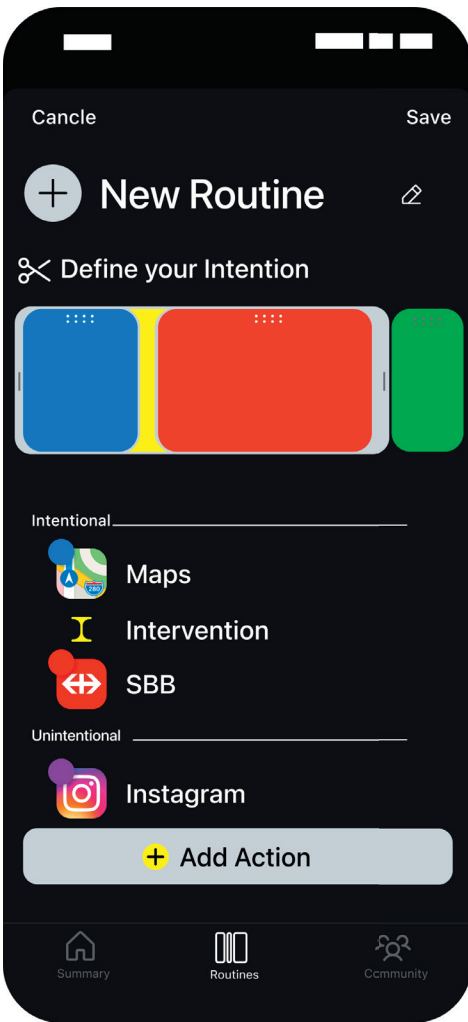
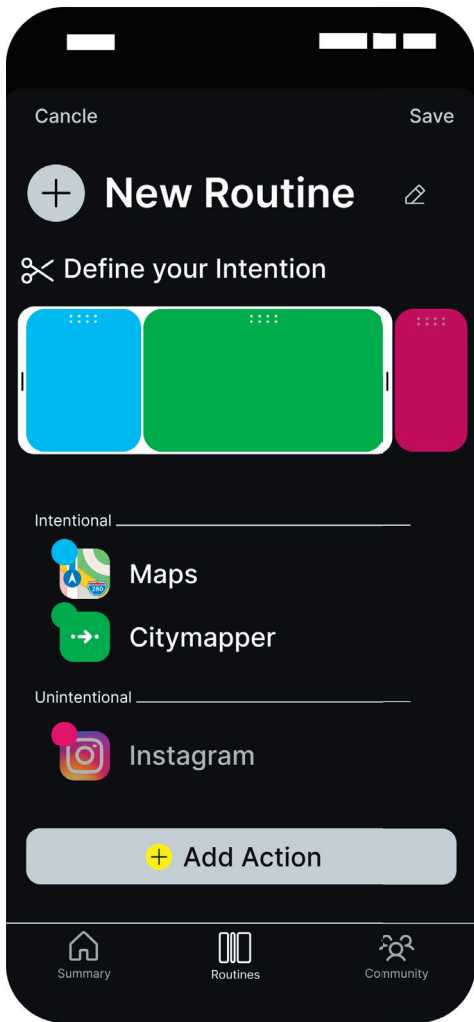


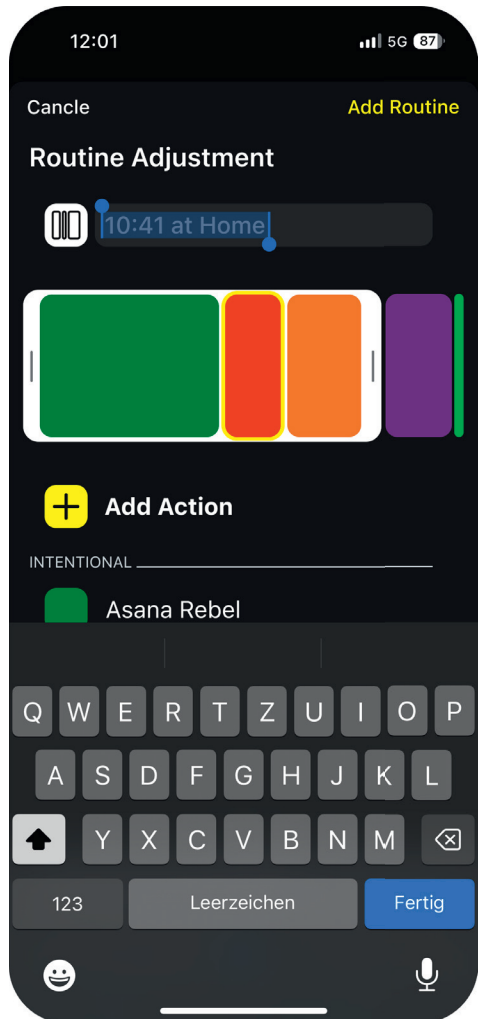
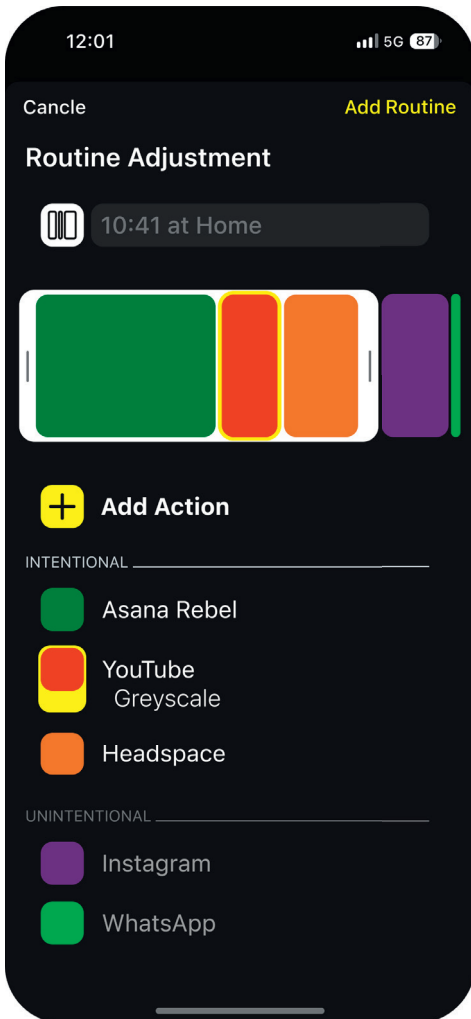
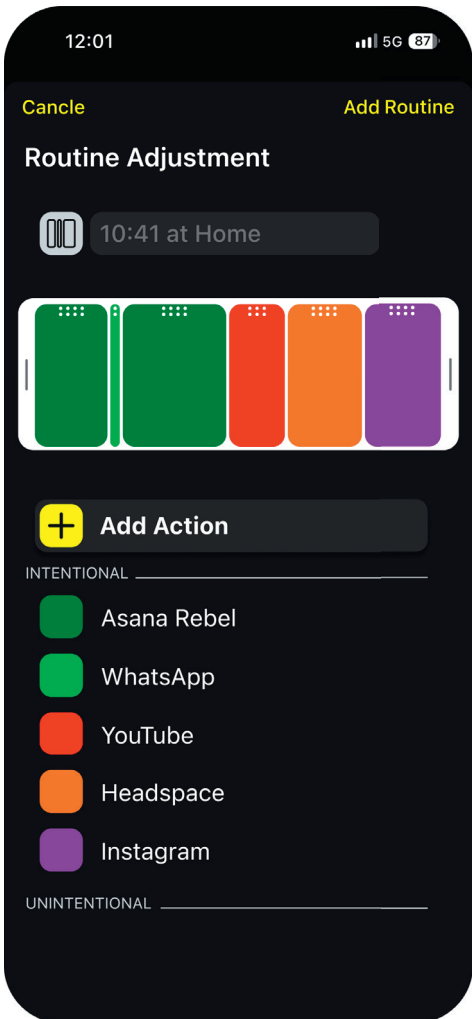
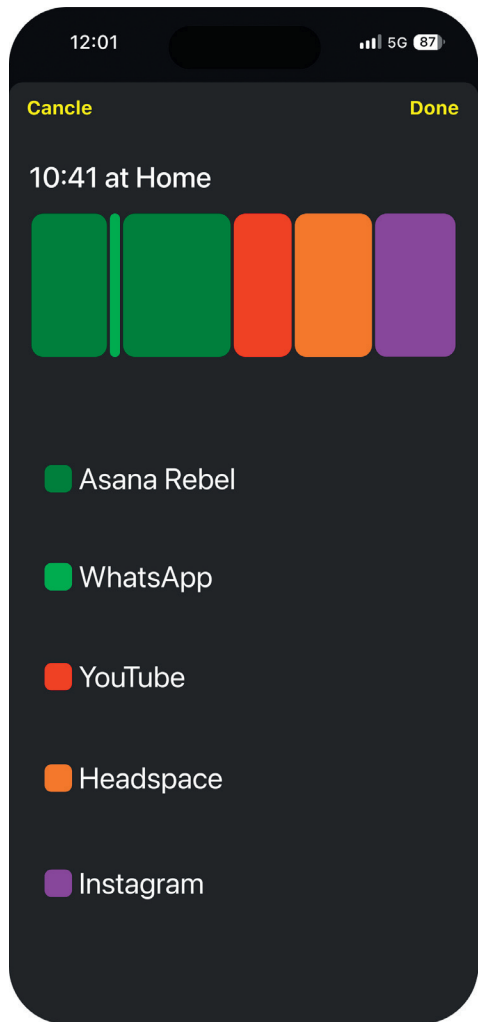
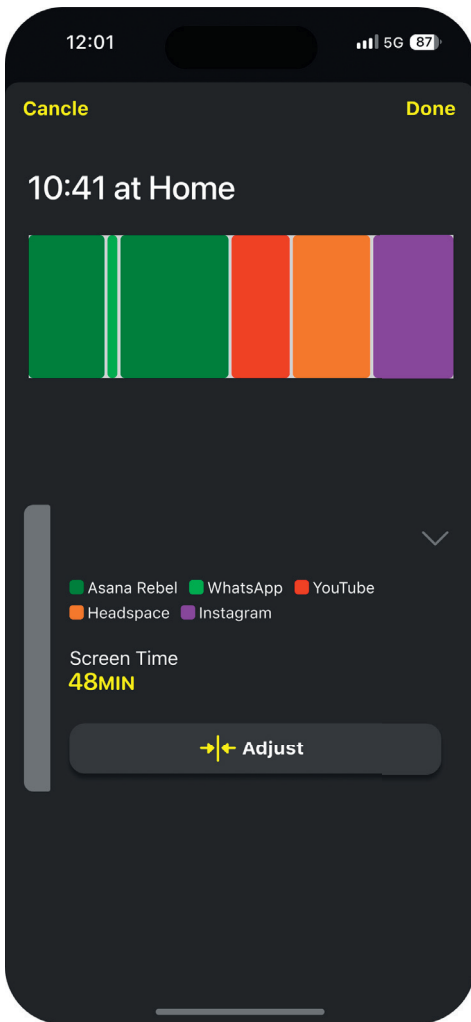


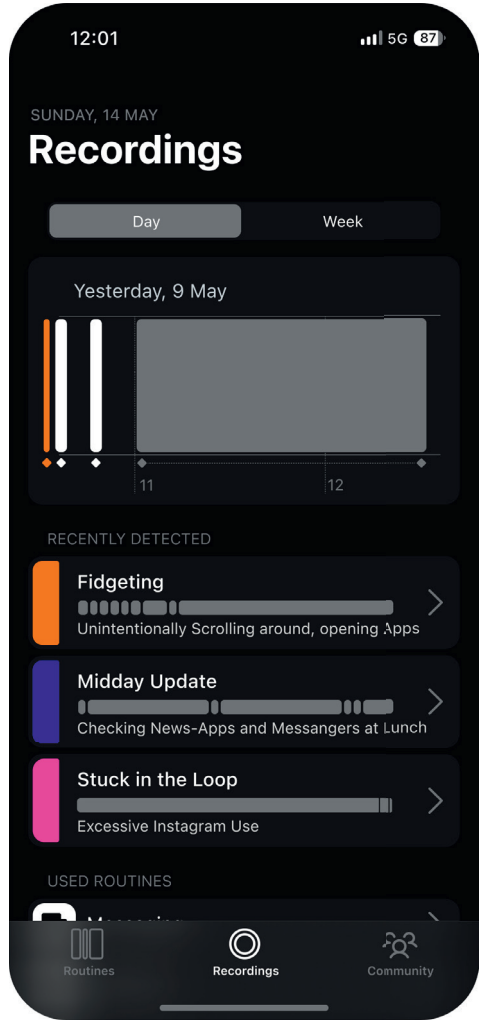
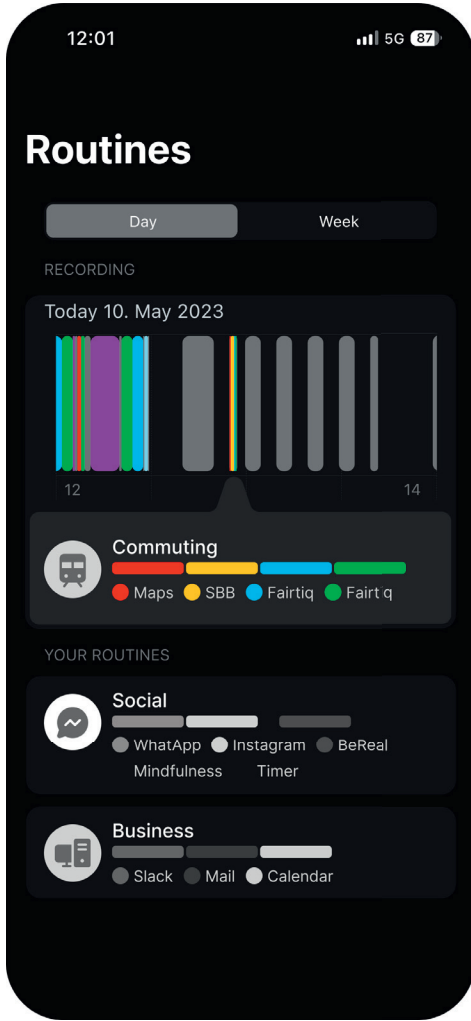
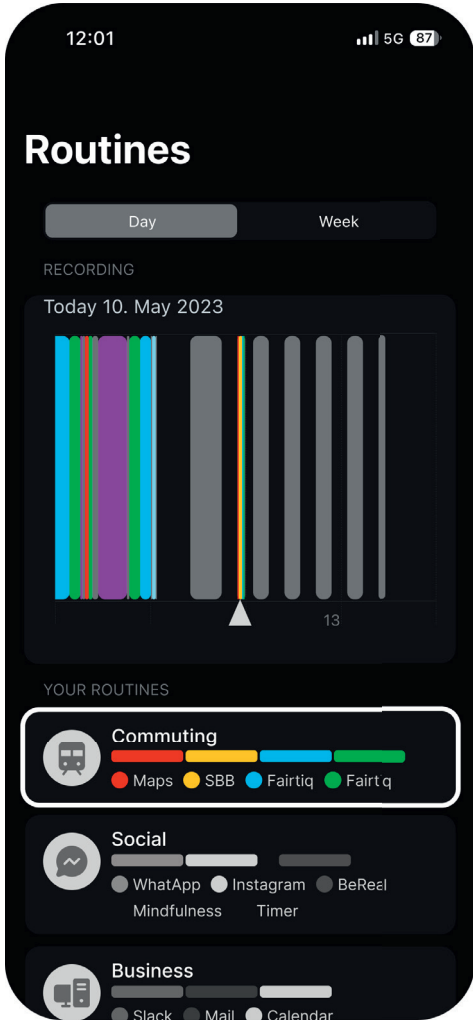
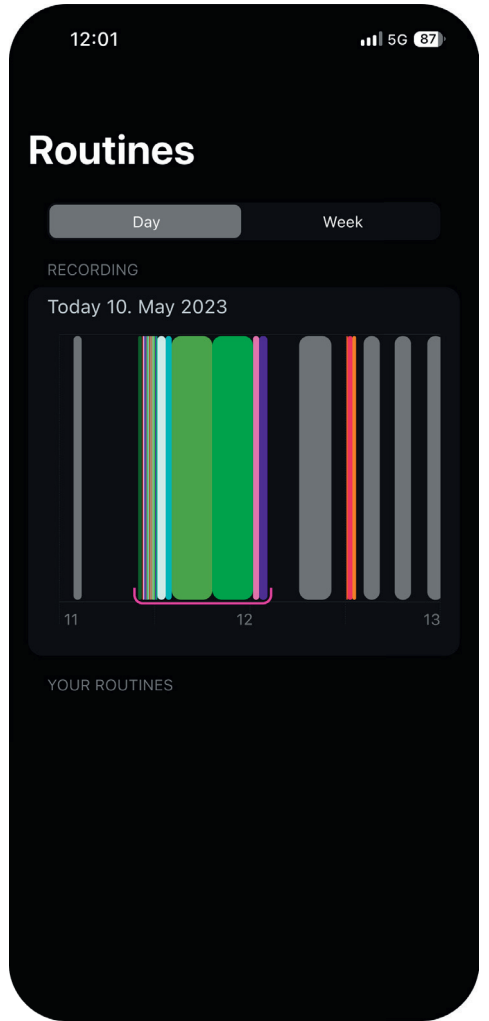


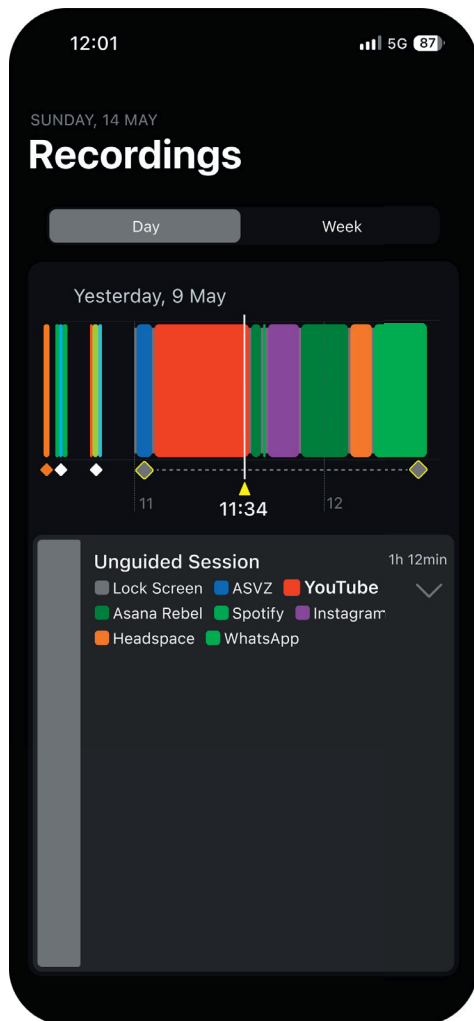
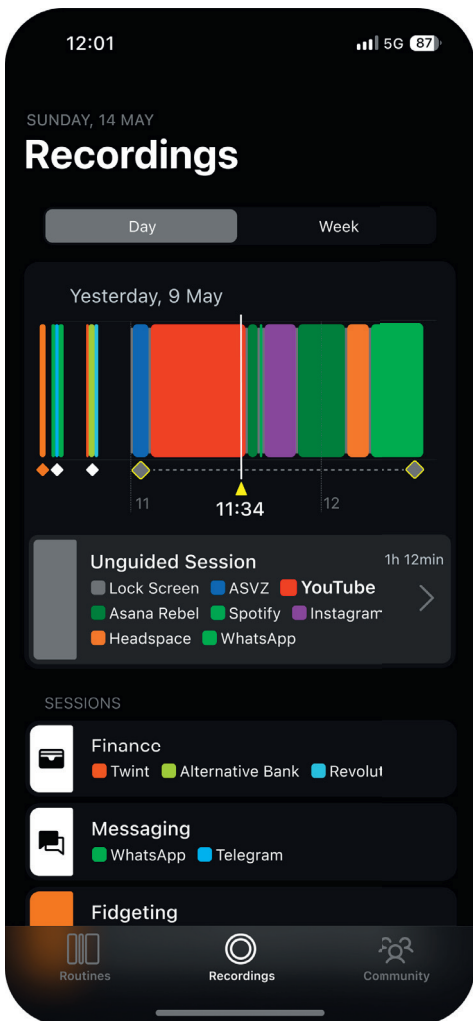
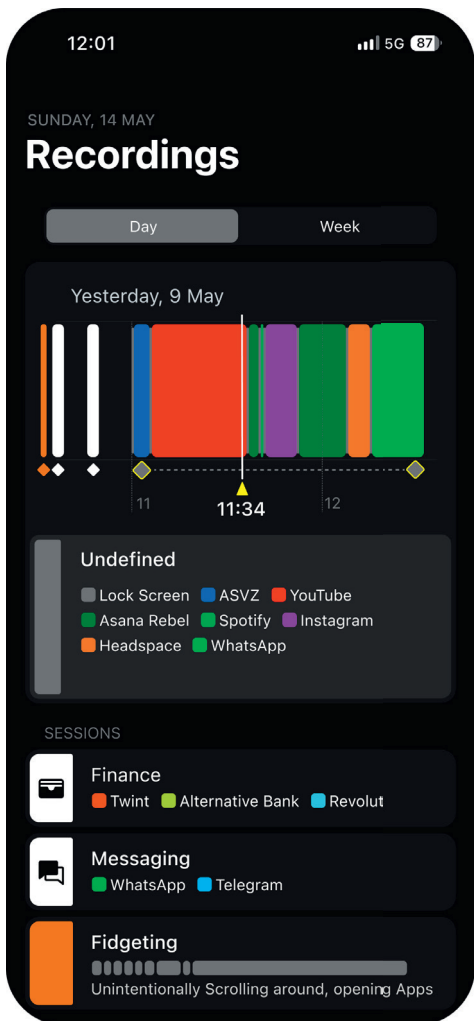
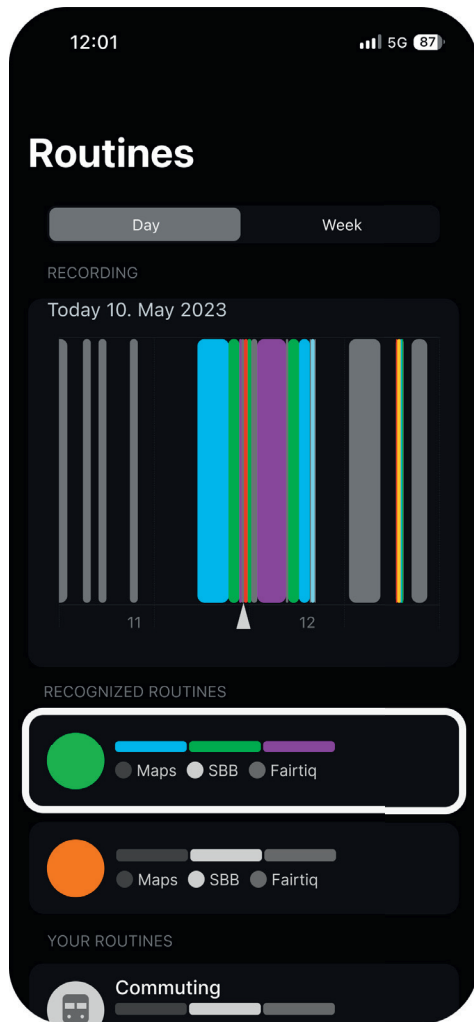
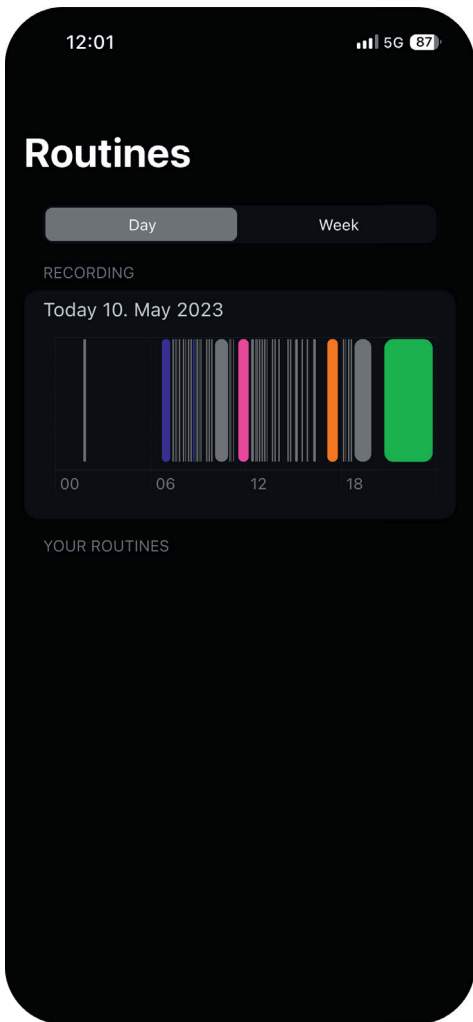
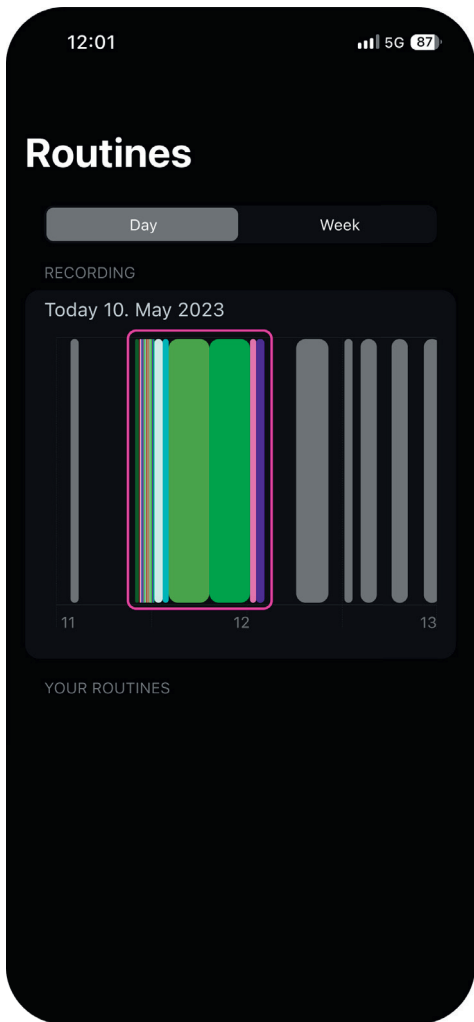


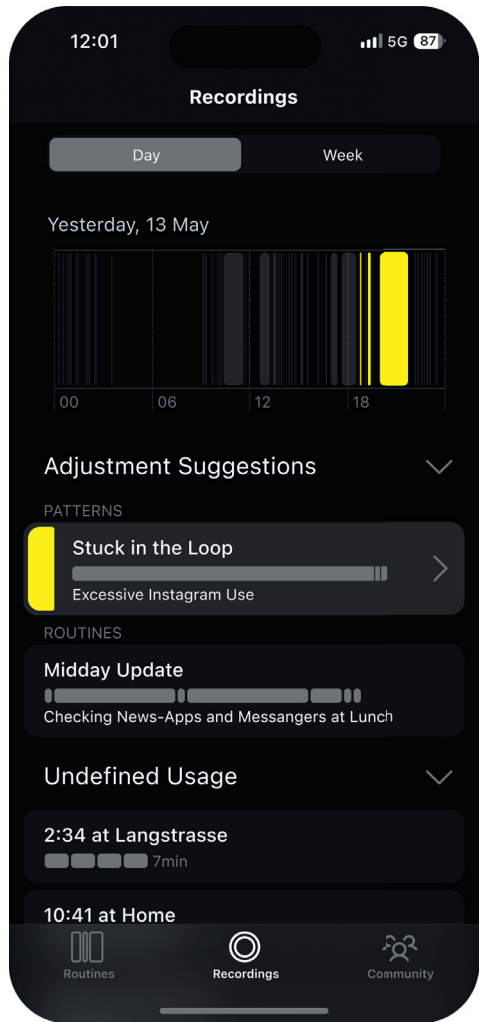
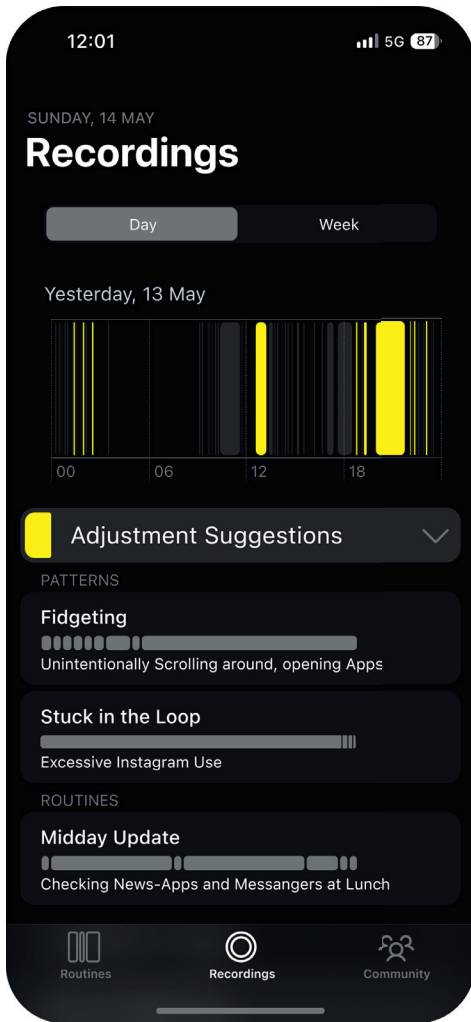
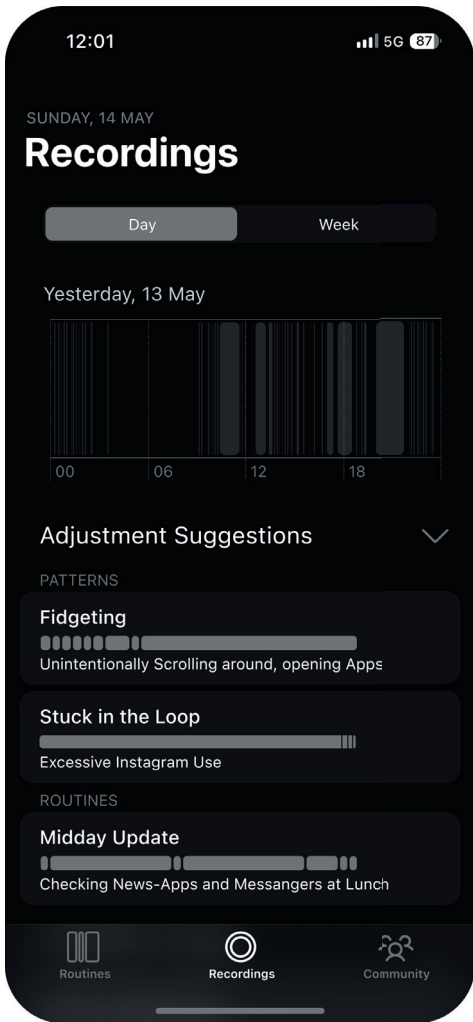
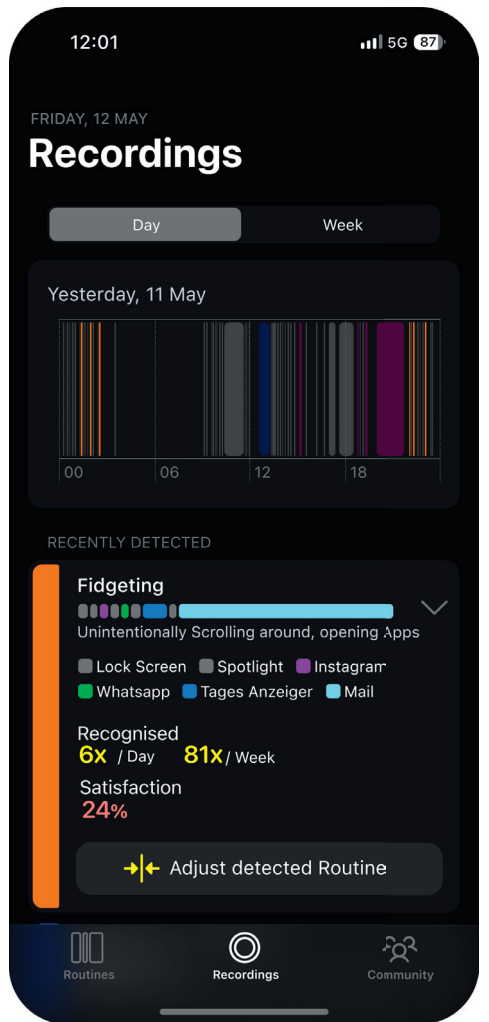
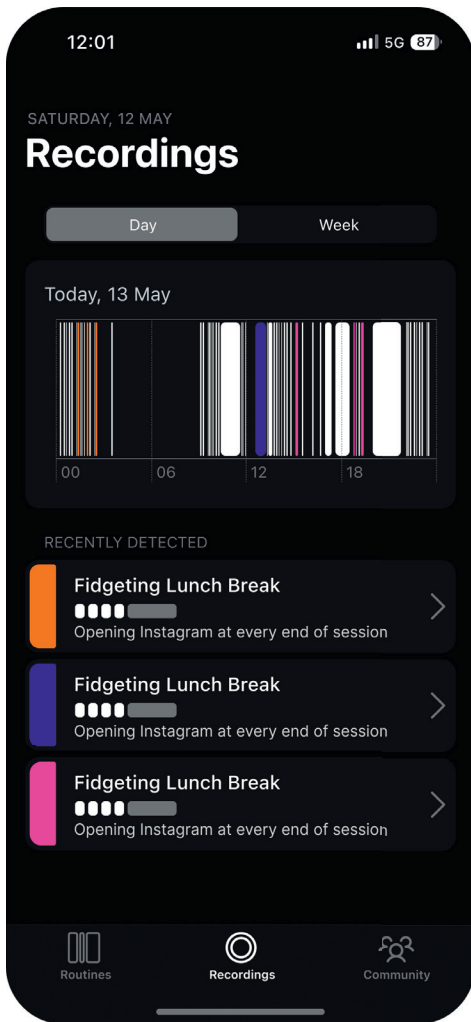
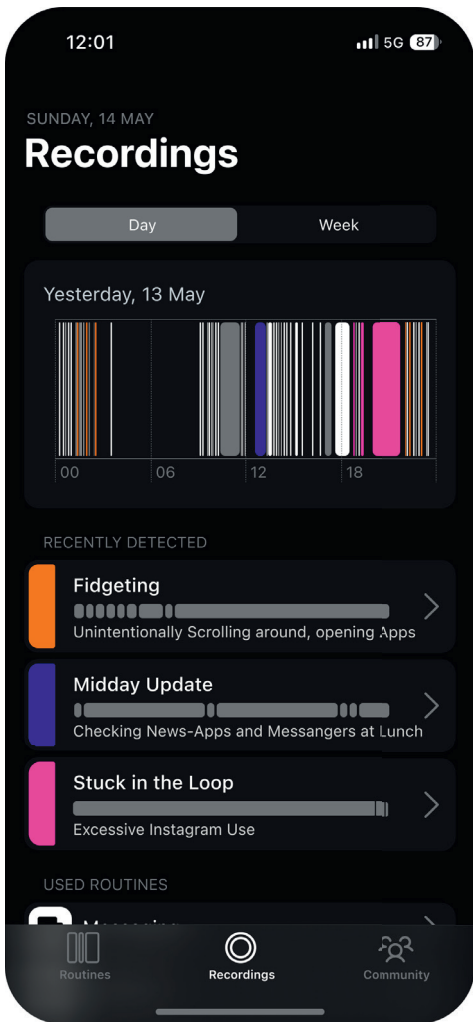


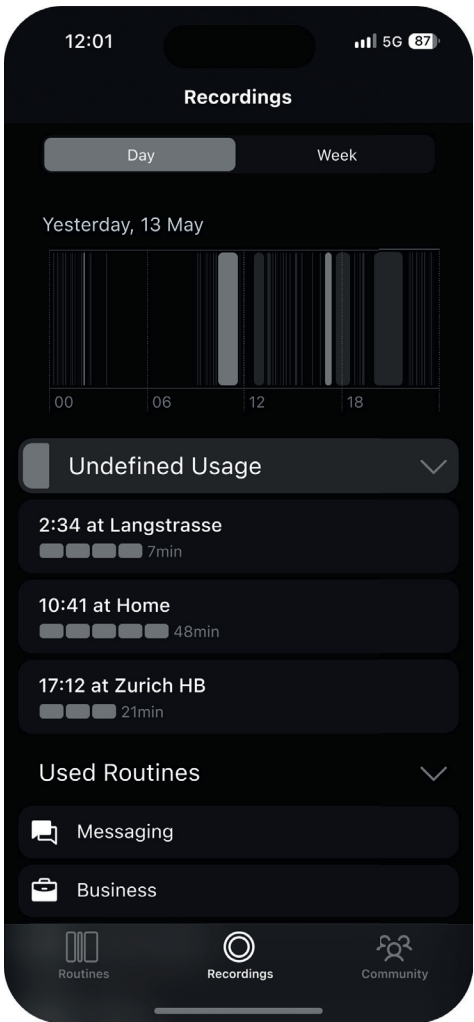
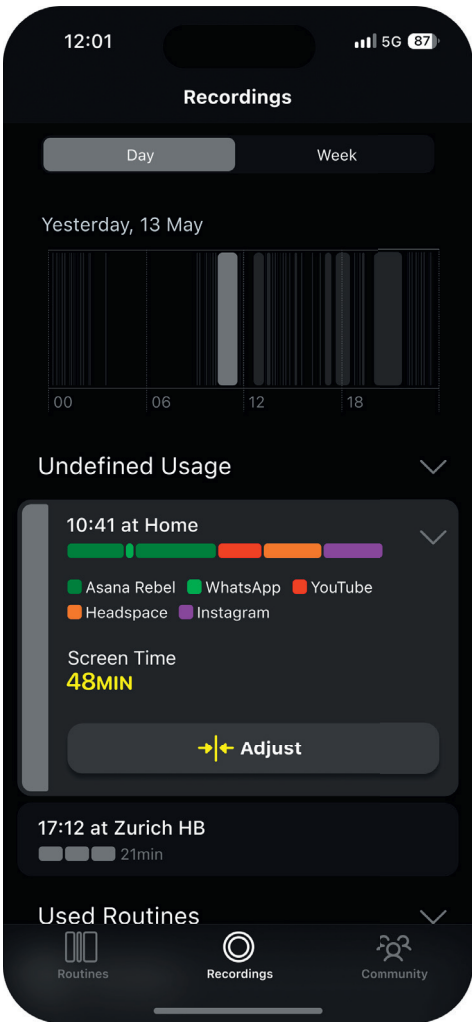
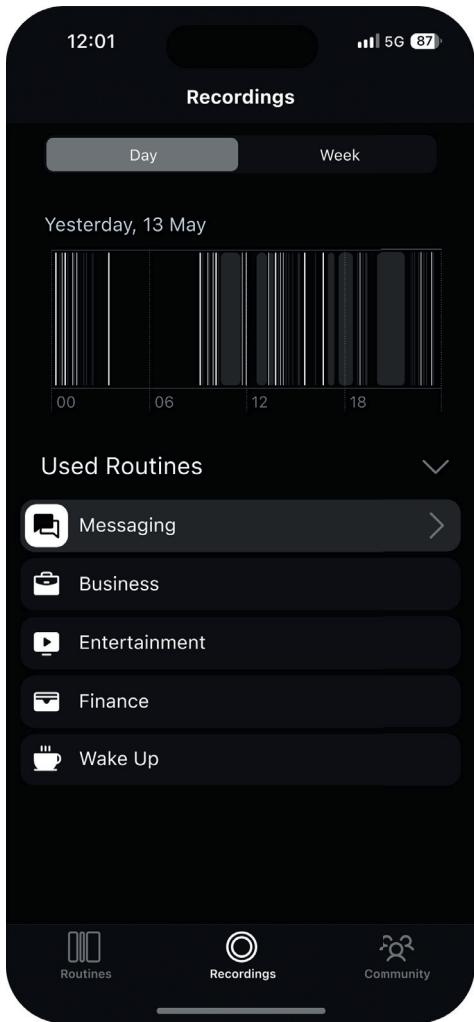
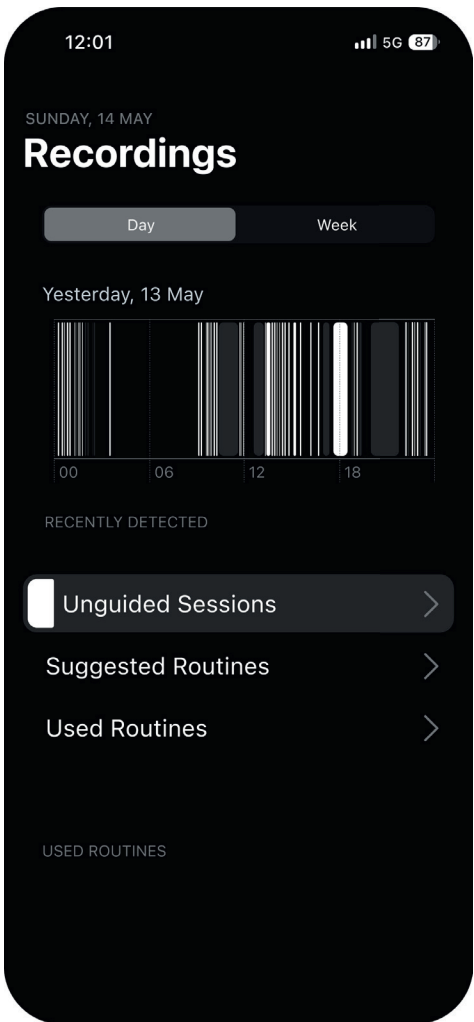
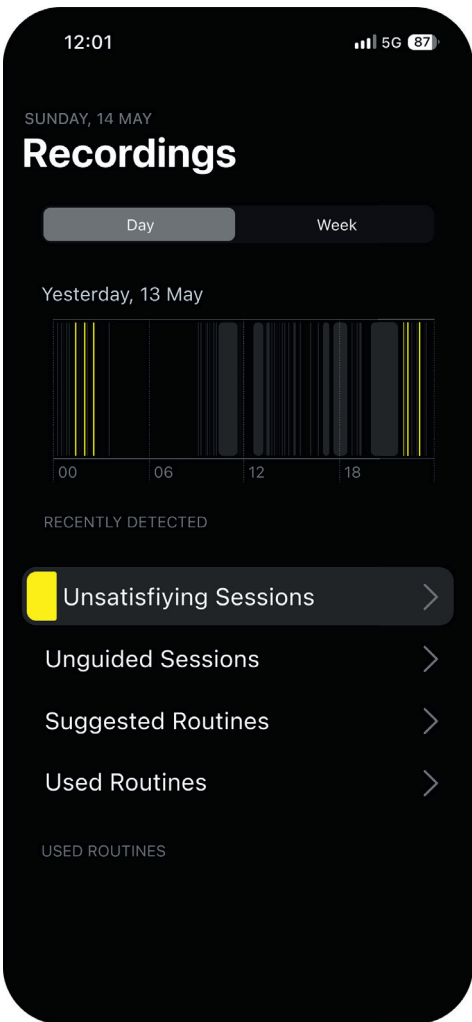
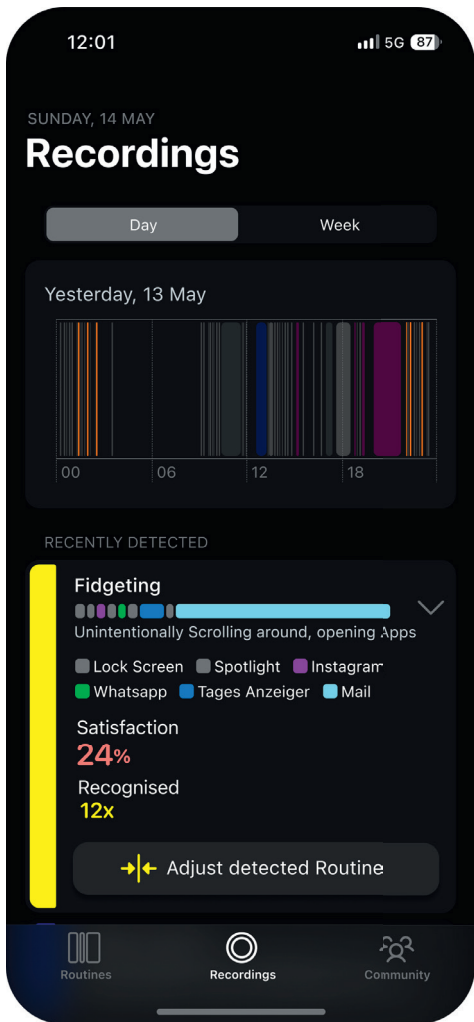


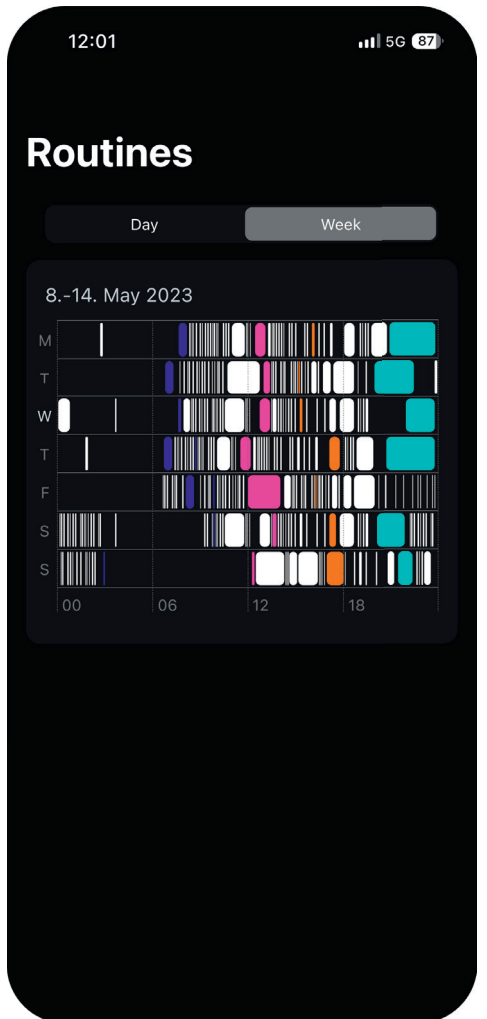
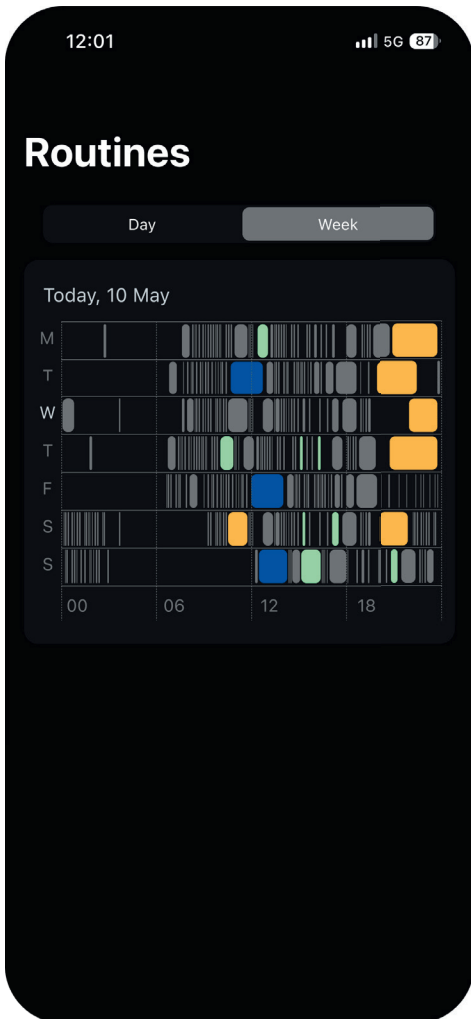
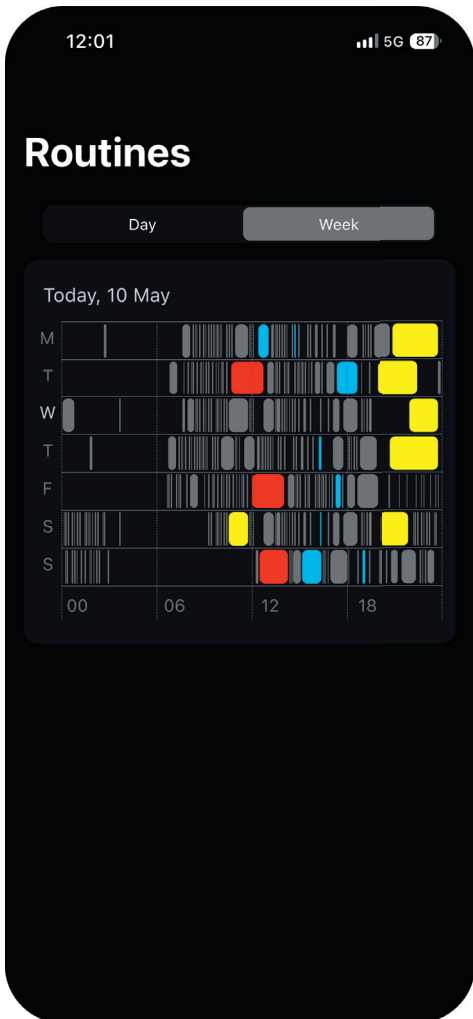
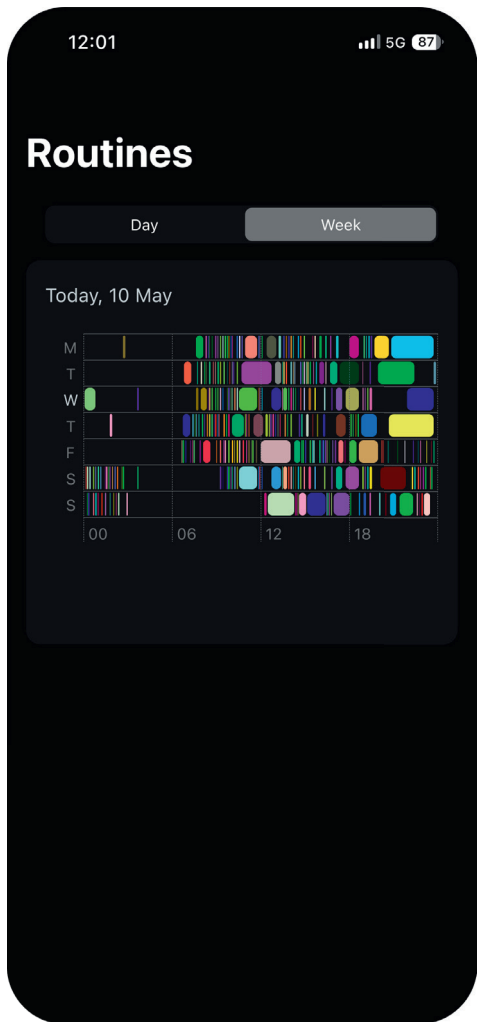
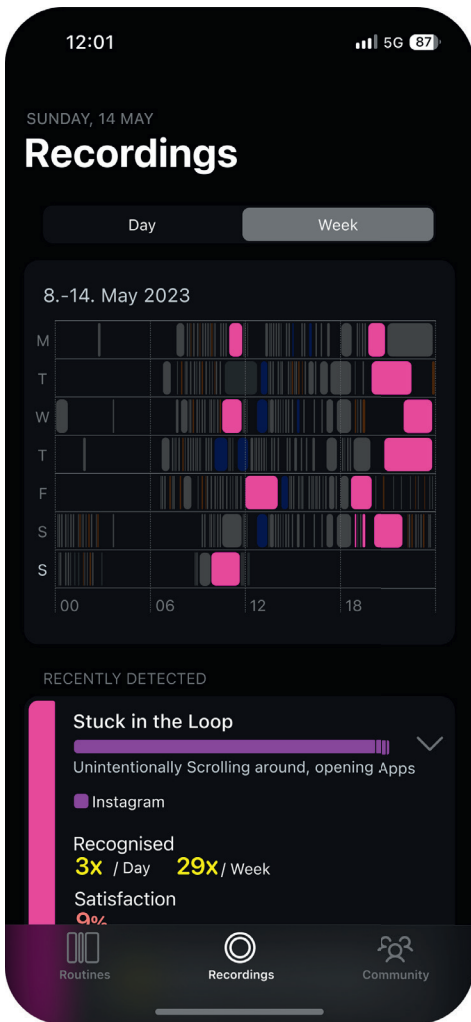
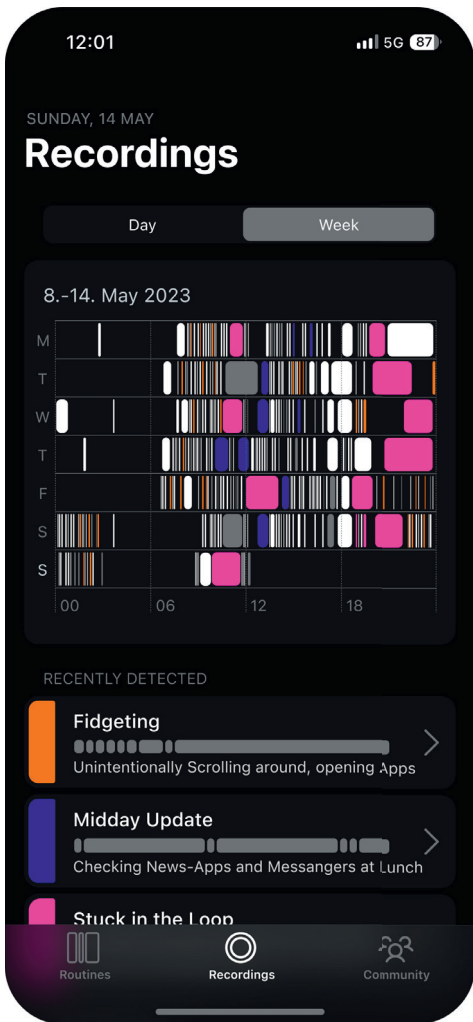


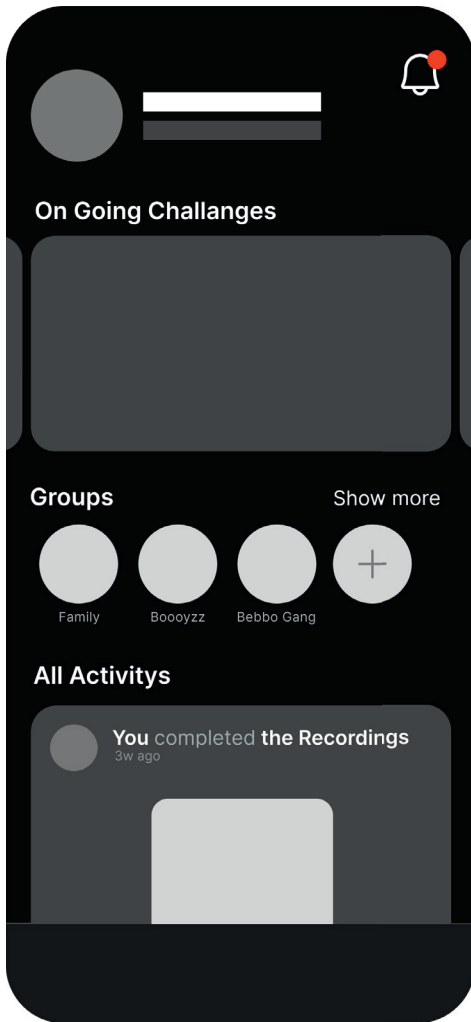
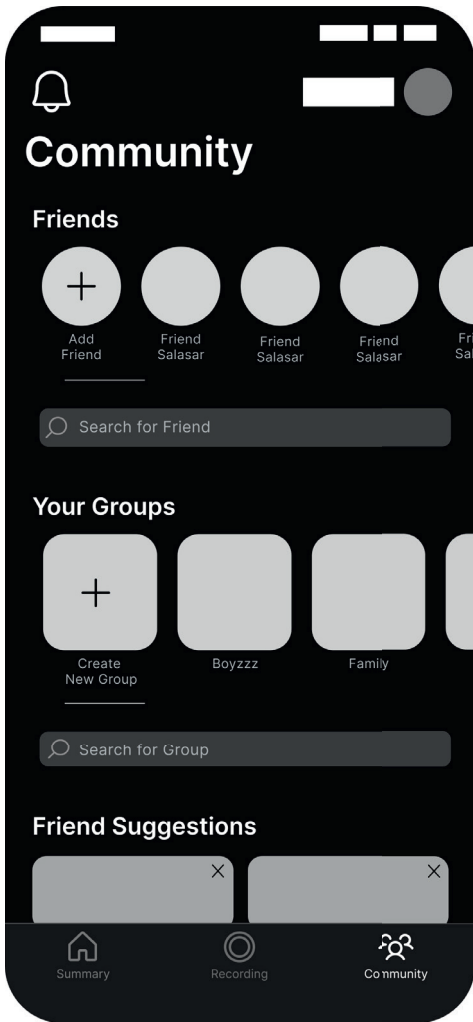
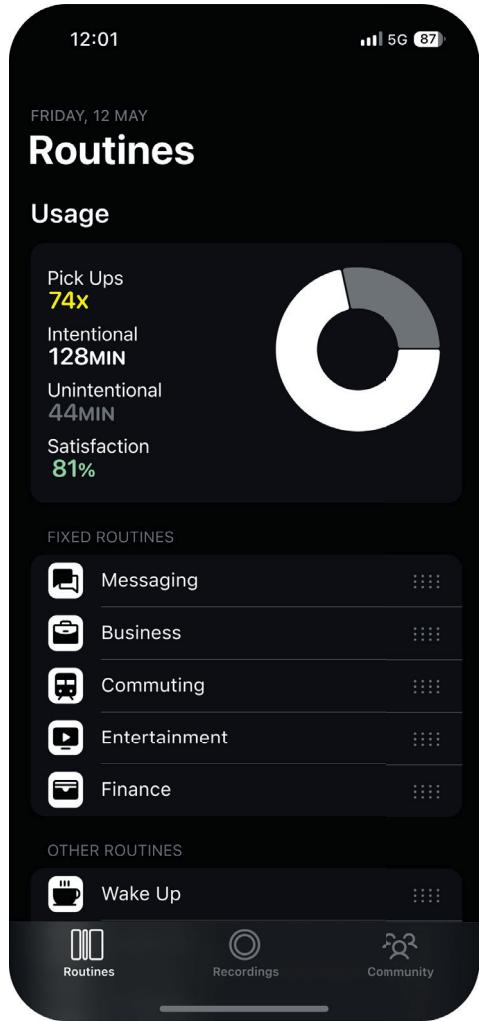


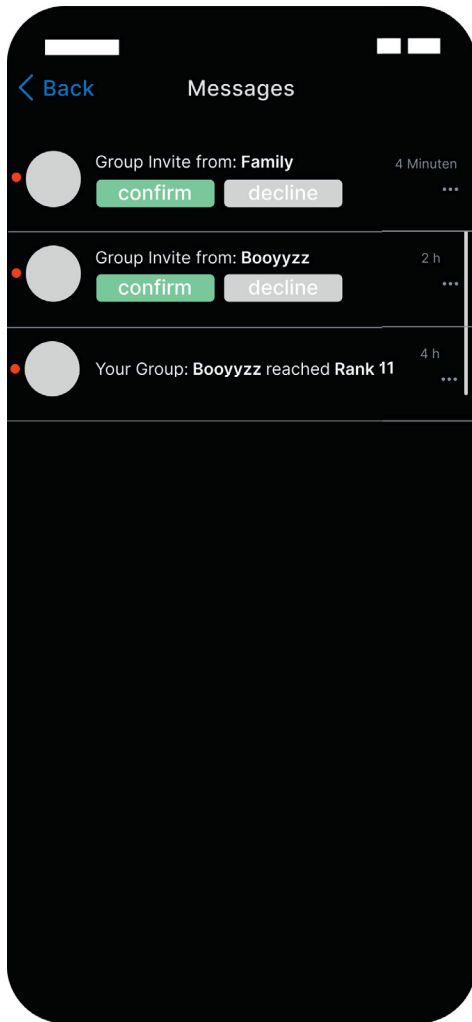
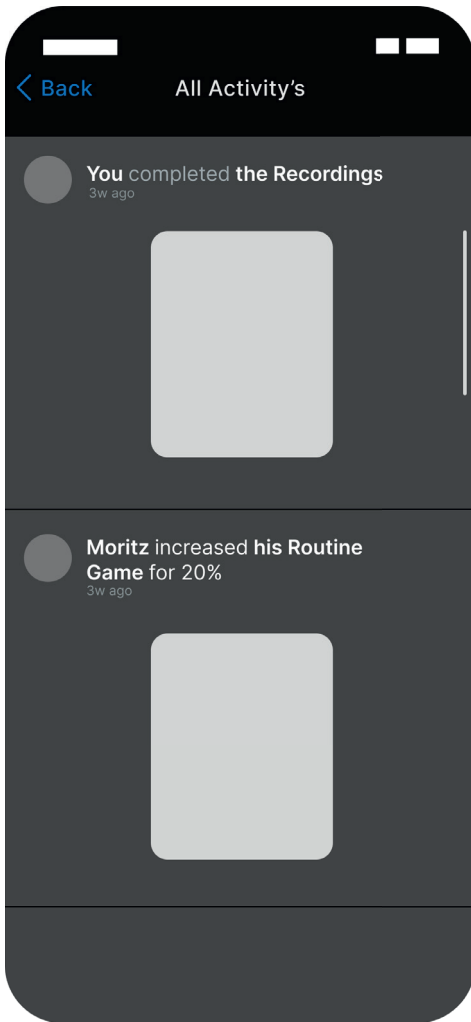
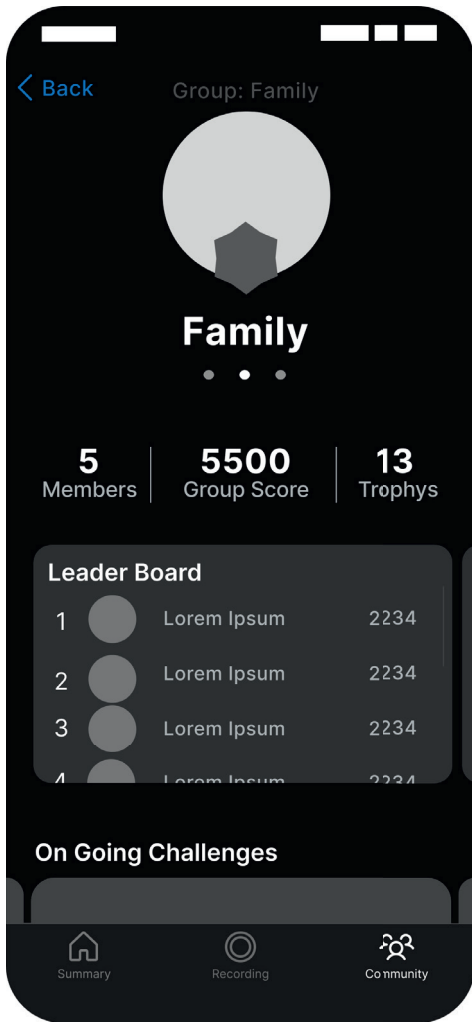
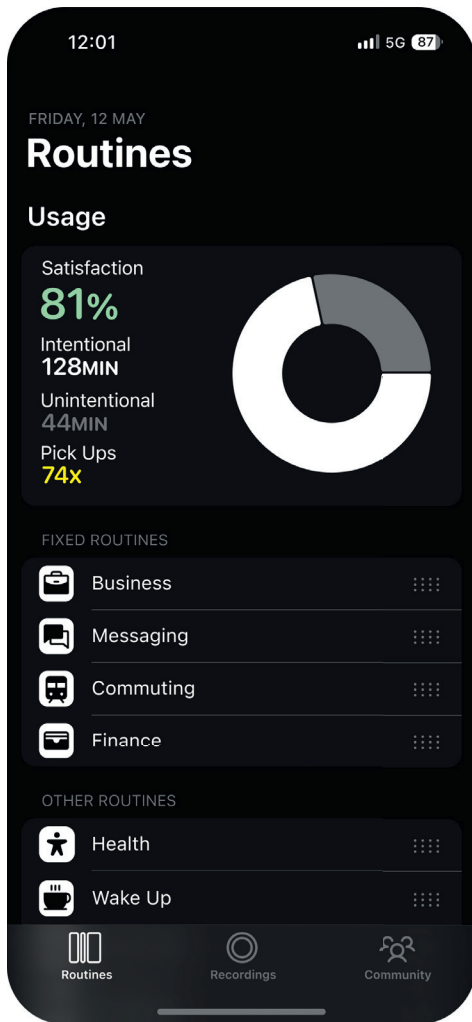
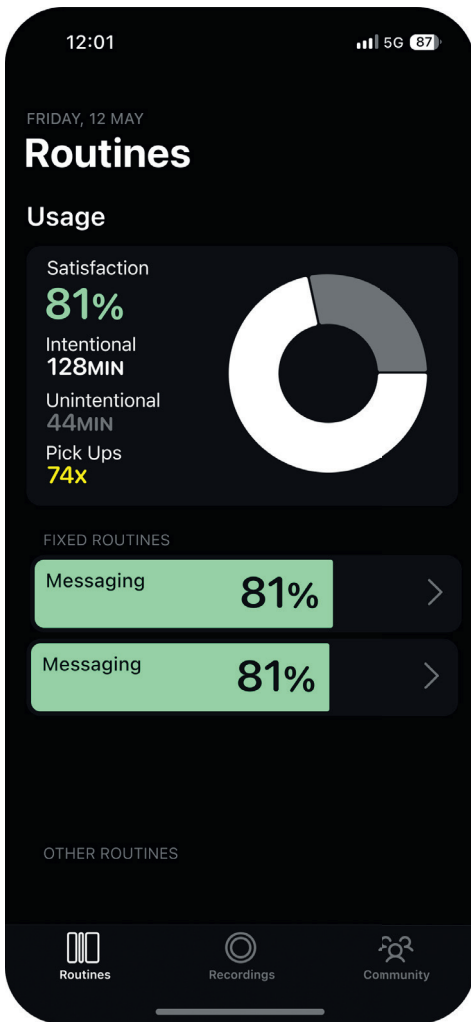
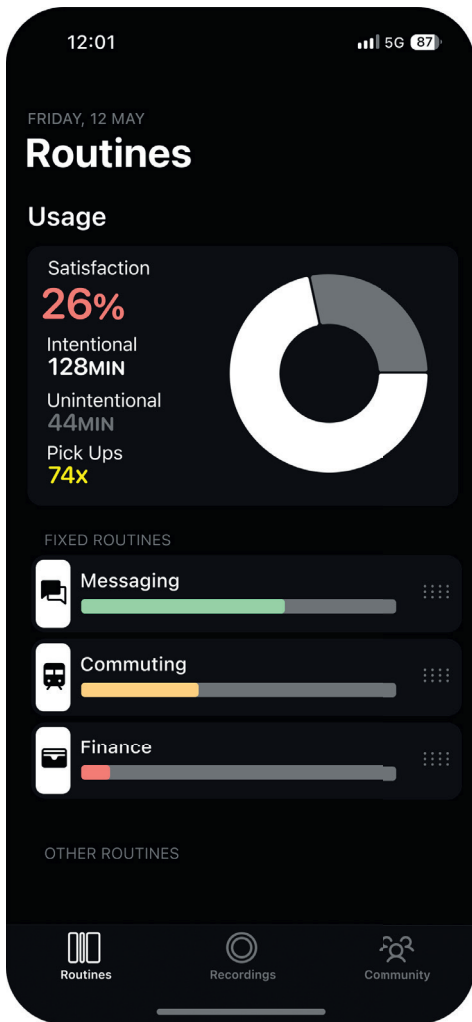


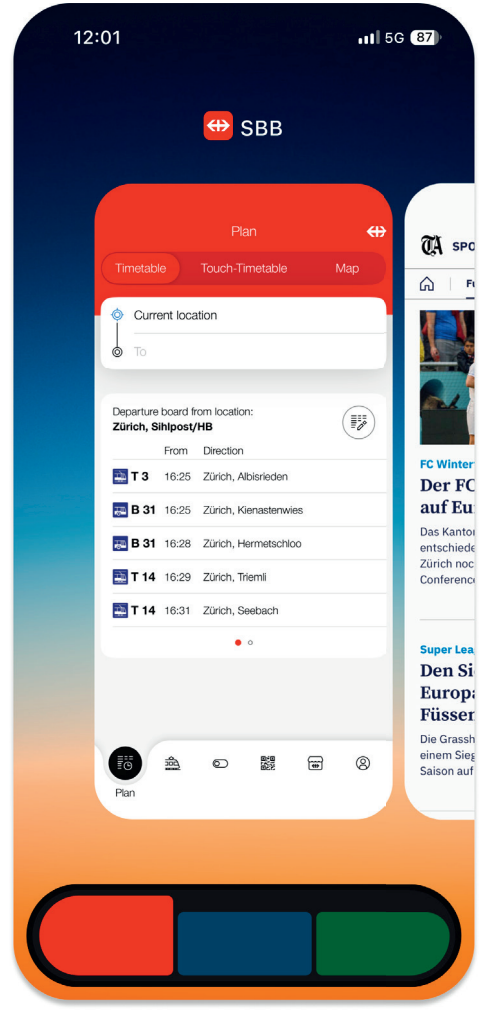
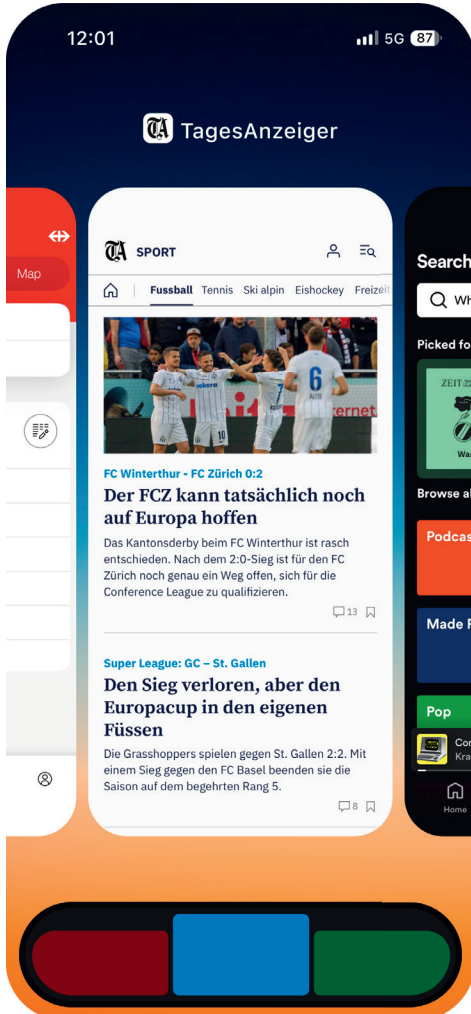
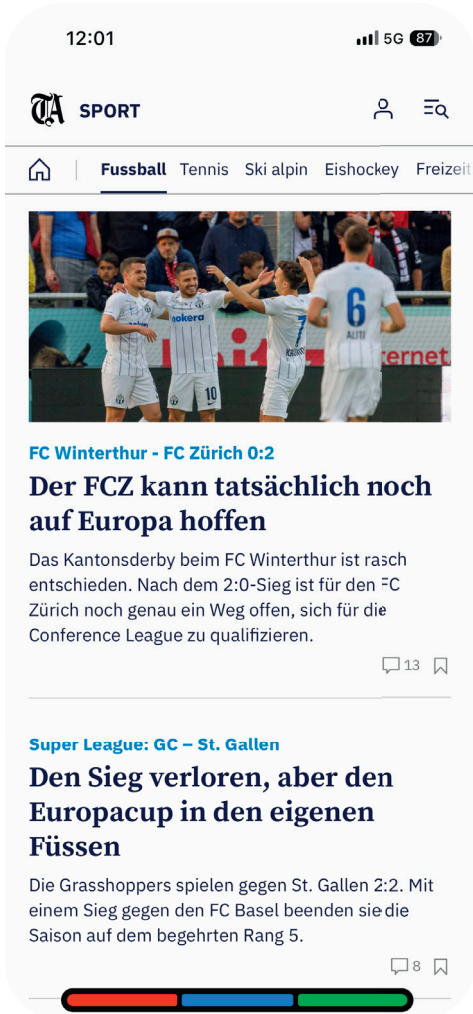
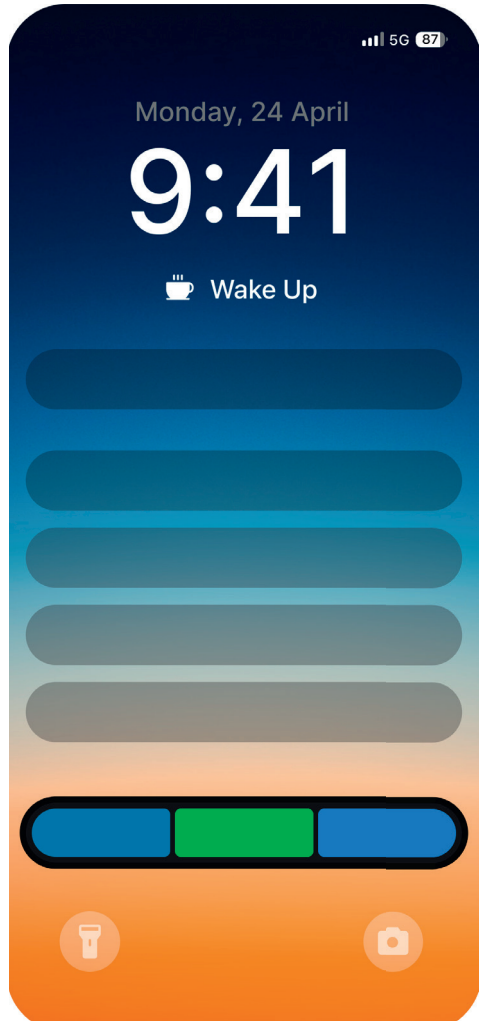
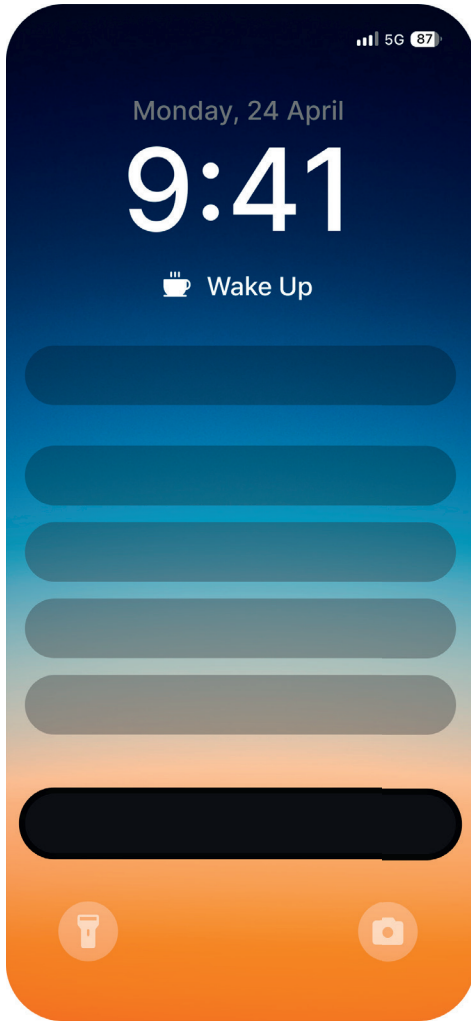
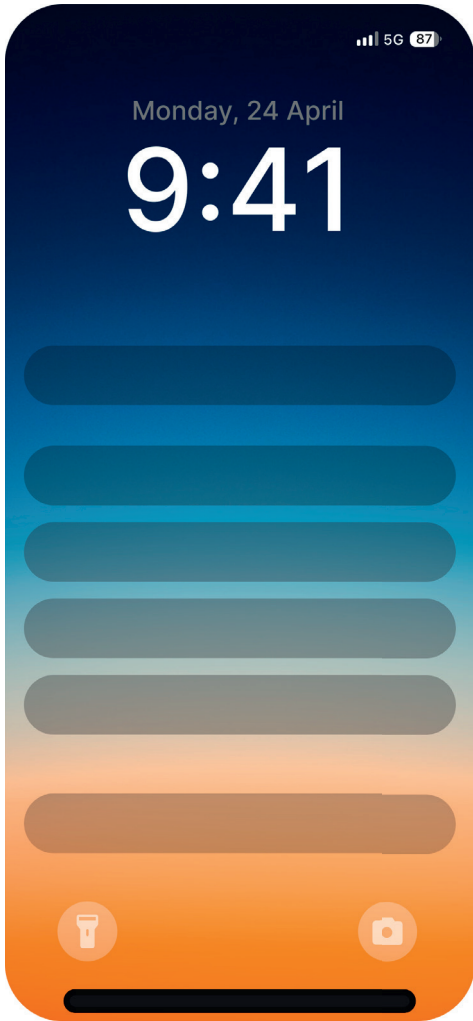


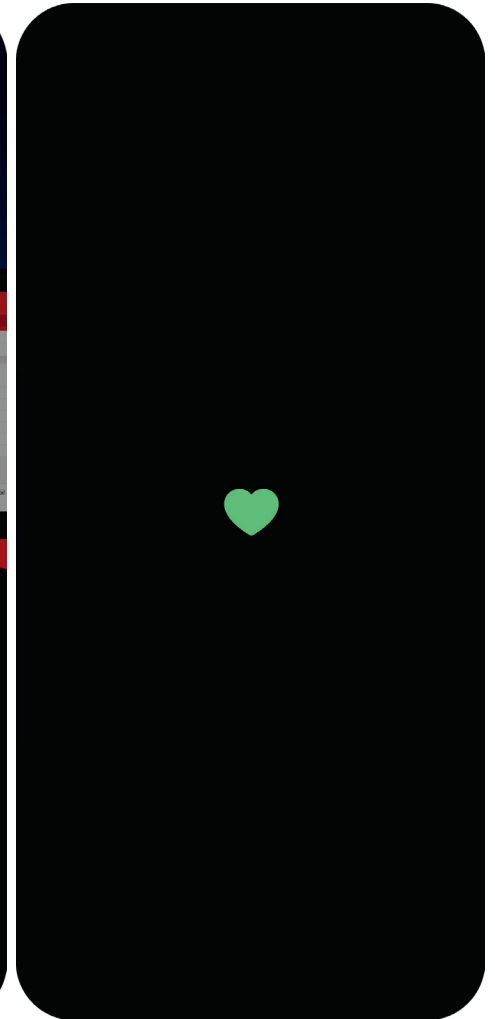
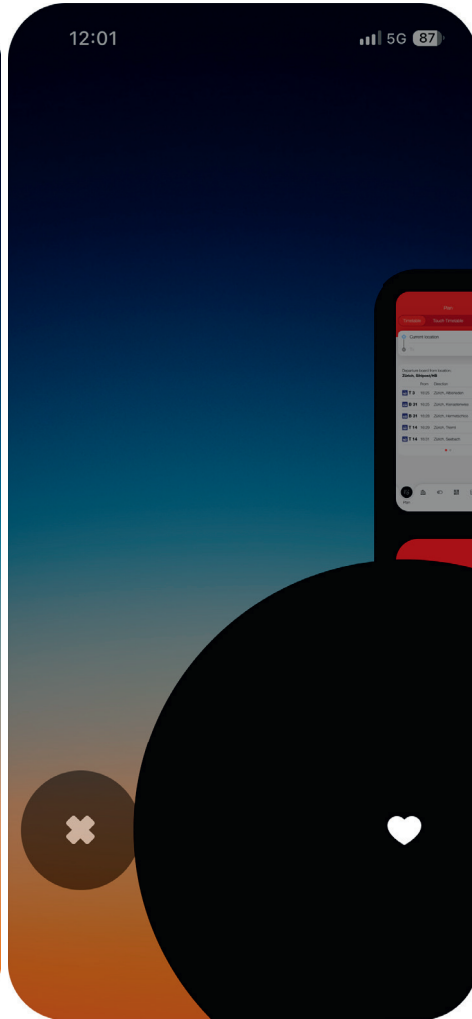
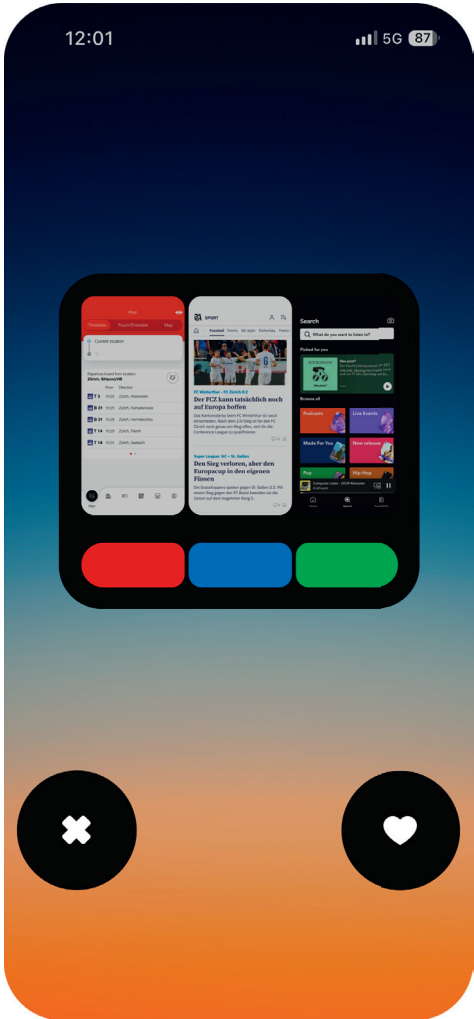
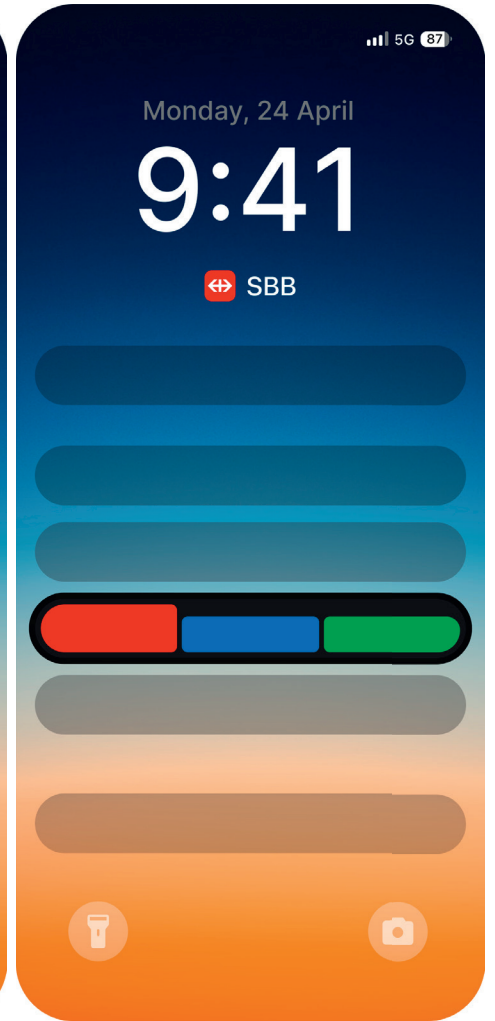
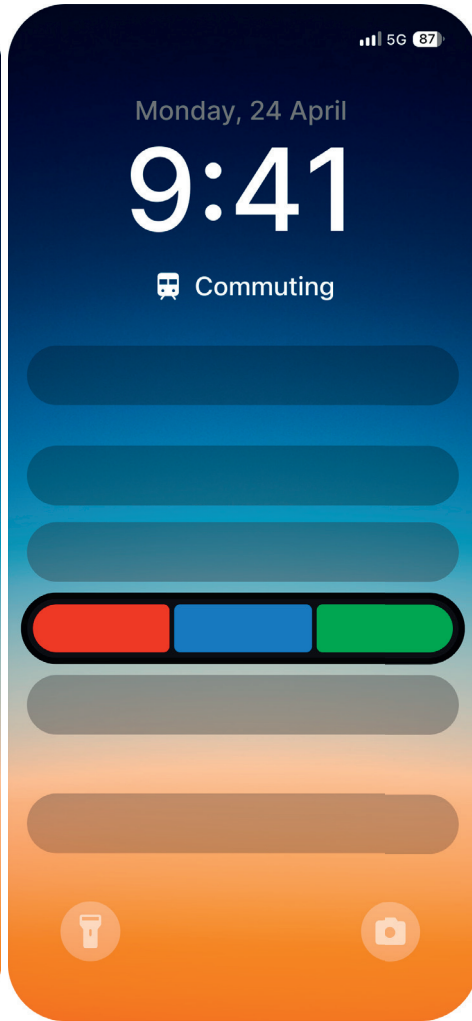
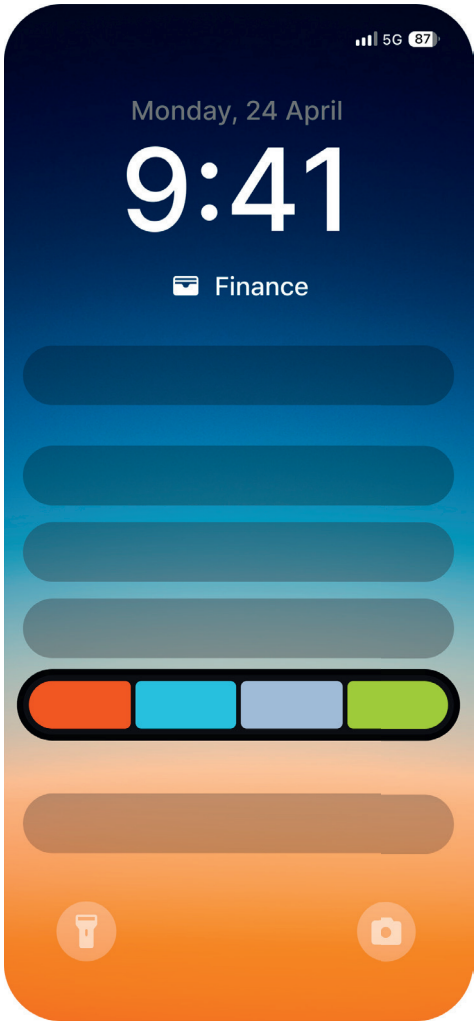


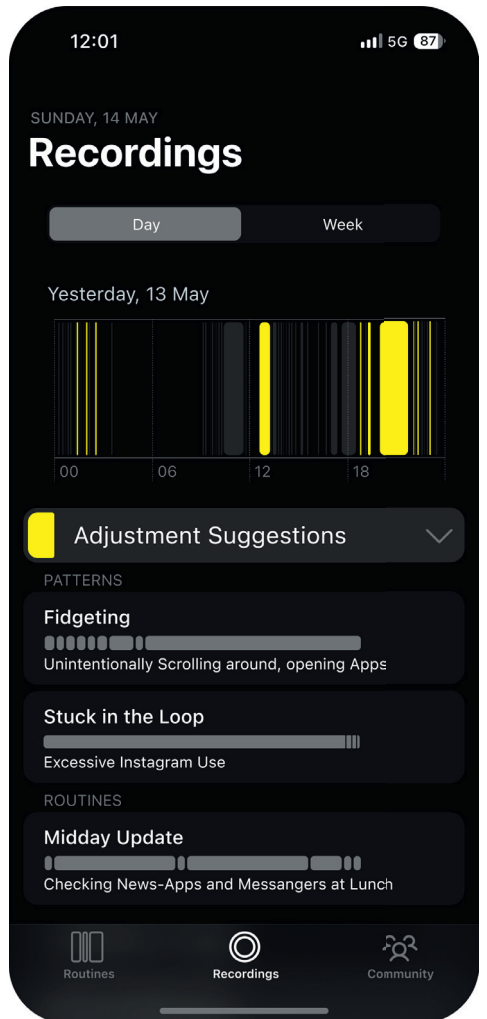
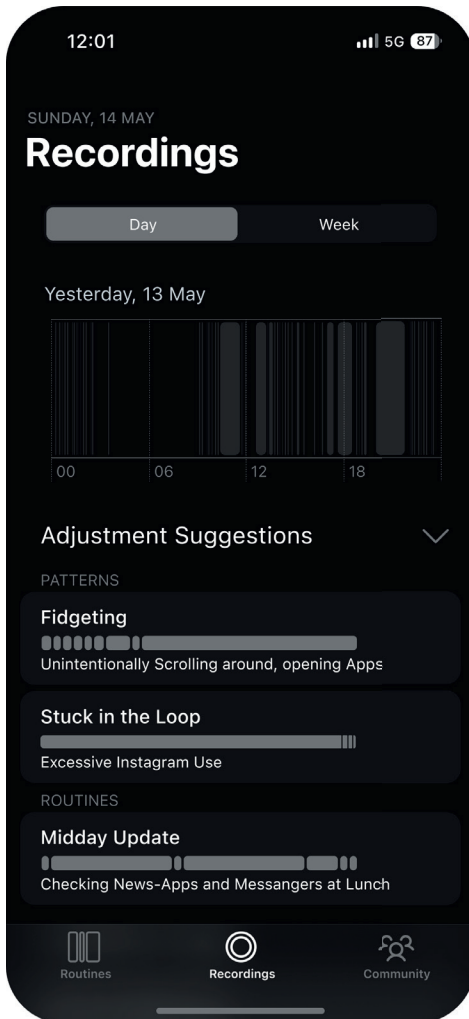
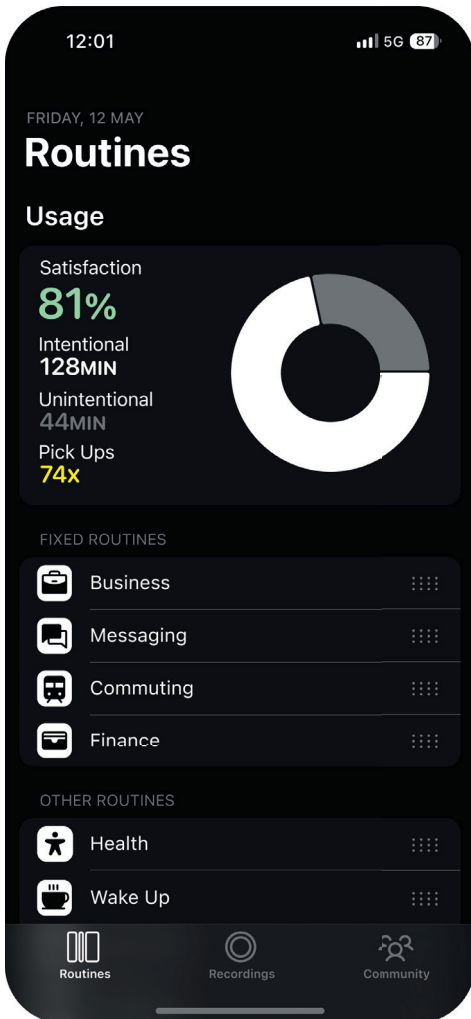
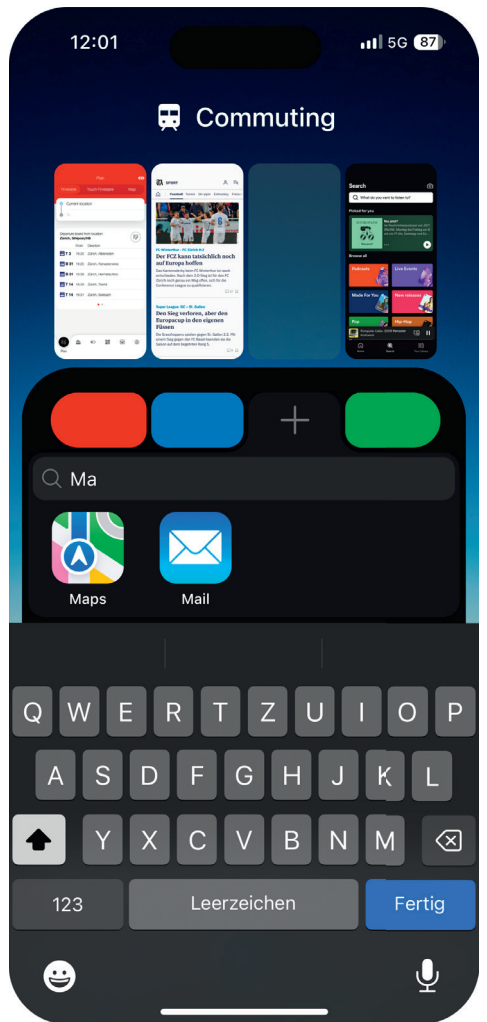
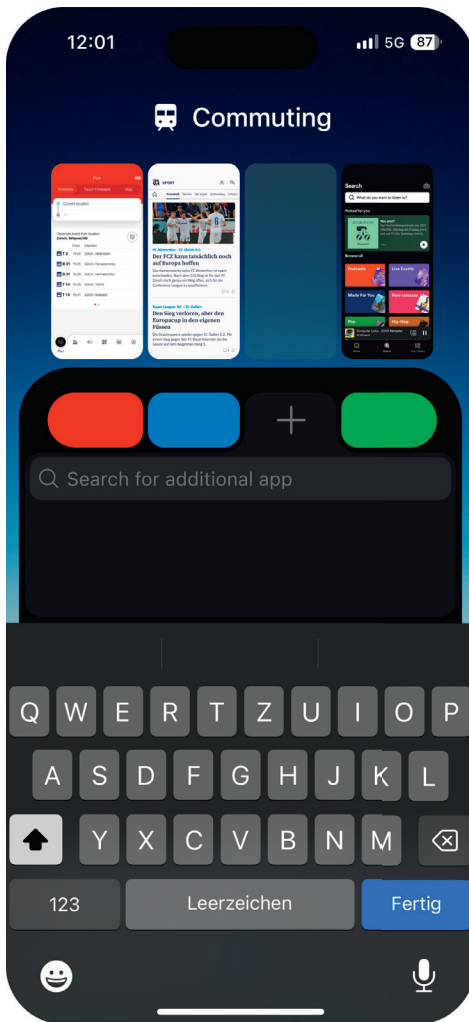
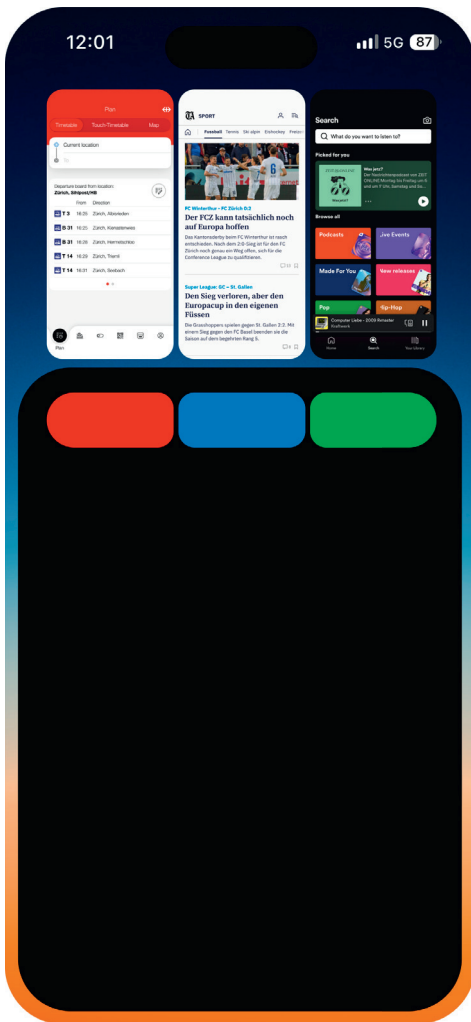












21:06 5G 87%

FRIDAY, 12 MAY

Community

On Going Challenges

Make 40 Routine Adjustments: 22/40 **100**

Have a daily Satisfaction of at least 70%: 0/15 **75**

Create a new Routine: 0/1 **20**

Groups Show more

- Family
- Booyzz
- Bebbo Gang
- Add


All Activities

You completed the Recordings 3w ago

Routines Recordings Community

21:06 5G 87%

Back Janosch Tillander




345

☆☆☆

13 Friends **345** Score **49** Awards

Score over Time **345**

Day Week Month Year



Best Working Interventions


Grayscale 83%

Family Call 75%

Routines Recordings Community

21:06 5G 87%

Back Family



733

☆

5 Members **733** Group Score **4** Awards

Leaderboard Show more

- Kevin Quaratsch **1233**
- Elisabet Quaratsch **946**
- Laura Quaratsch **356**
- Markus Meier **244**

Best Working Interventions

Grayscale 83%

Family Call 75%

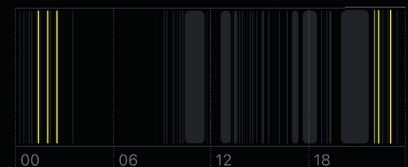
Routines Recordings Community

12:01 5G 87%

Recordings

Day Week

Yesterday, 13 May



Adjustment Suggestions

PATTERNS

Fidgeting Unintentionally Scrolling around, opening Apps

Stuck in the Loop

Excessive Instagram Use

ROUTINES

Midday Update Checking News-Apps and Messengers at Lunch

Undefined Usage


Routines Recordings Community

12:01 5G 87%

Recordings

Day Week

Yesterday, 13 May



Used Routines

- Messaging
- Business
- Entertainment
- Finance
- Wake Up


Routines Recordings Community

12:01 5G 87%

Recordings

Day Week

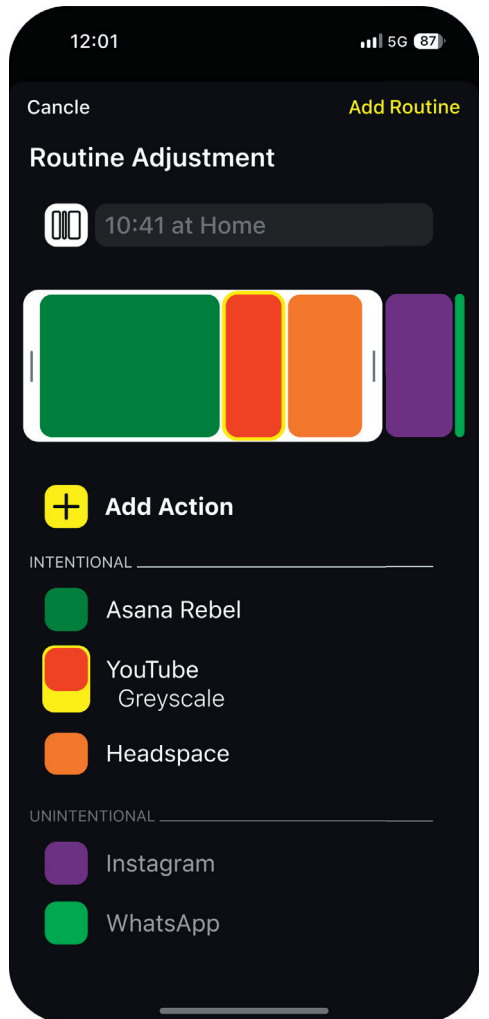
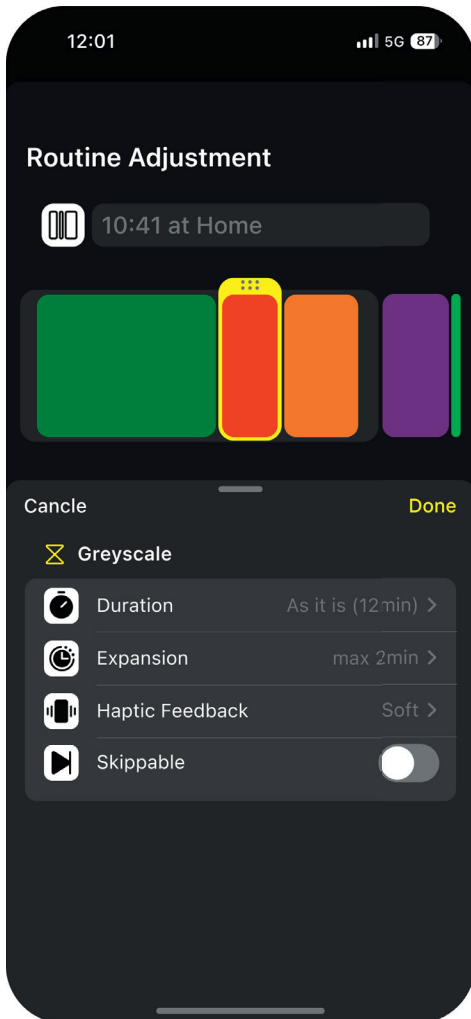
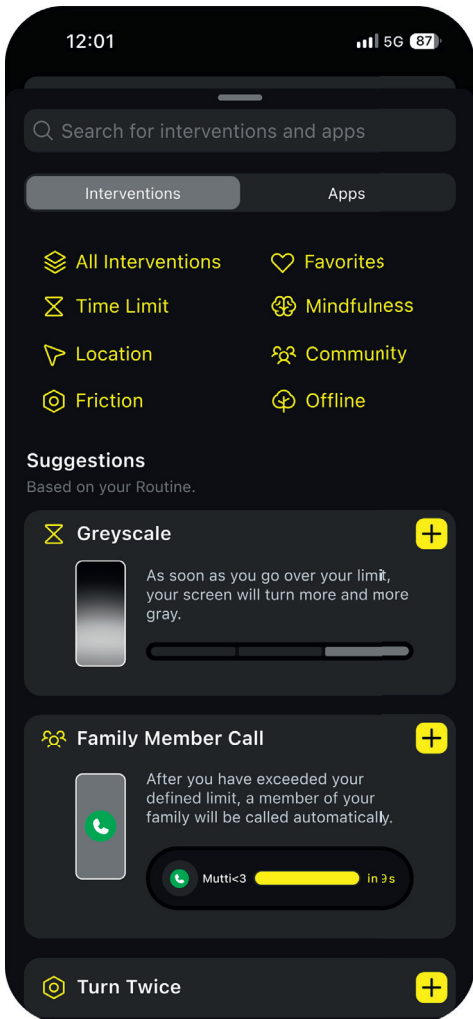
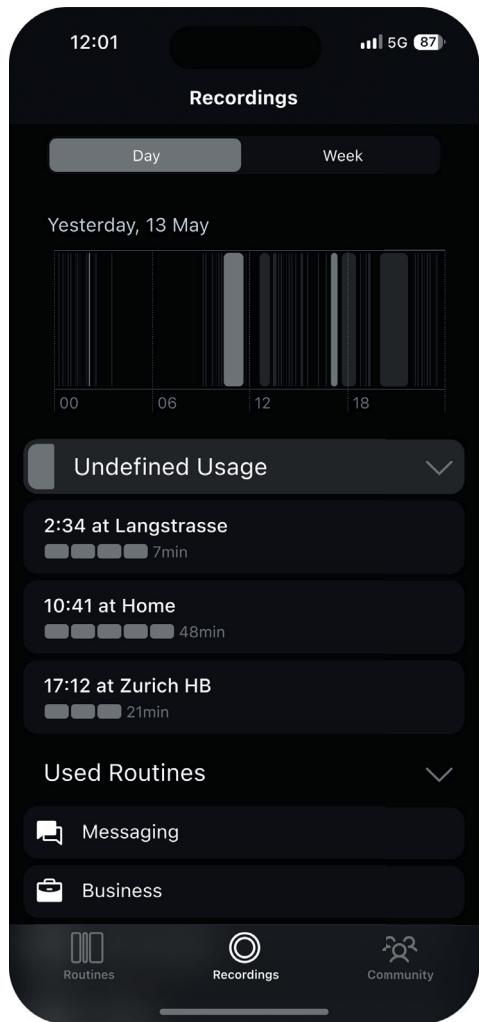
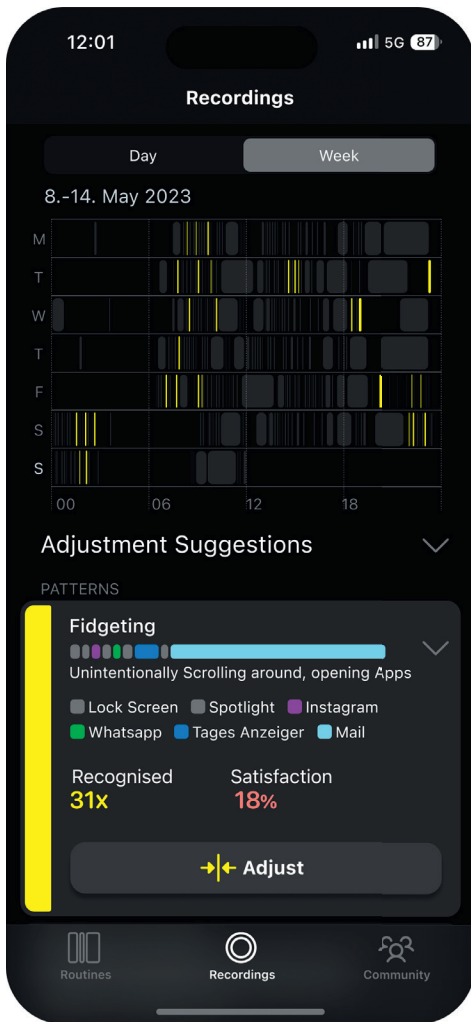
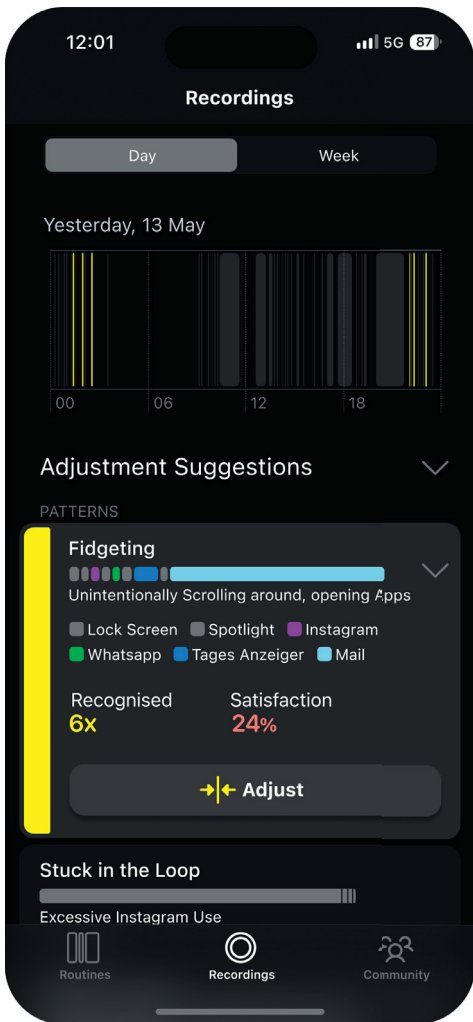
Yesterday, 13 May

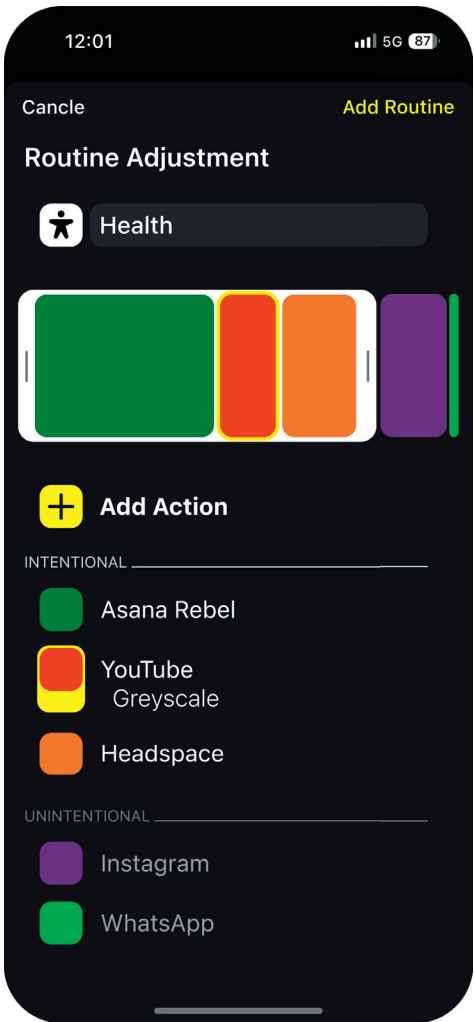
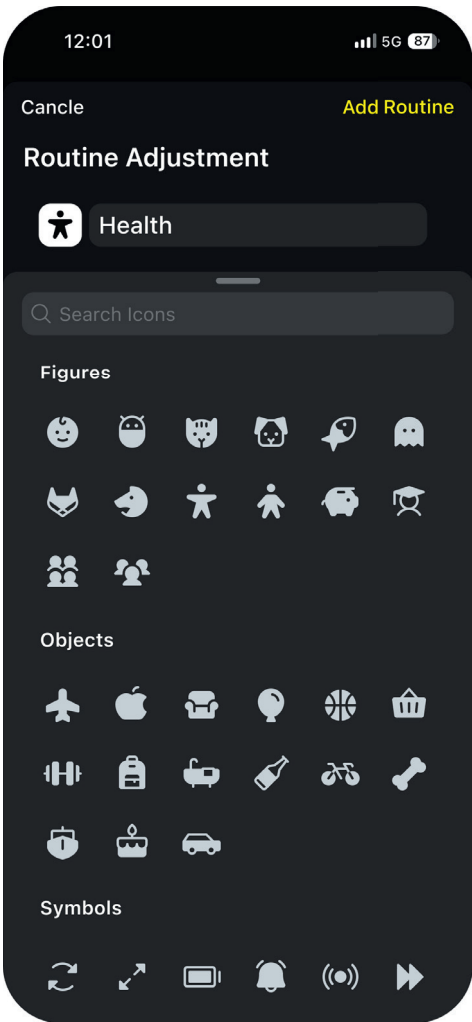
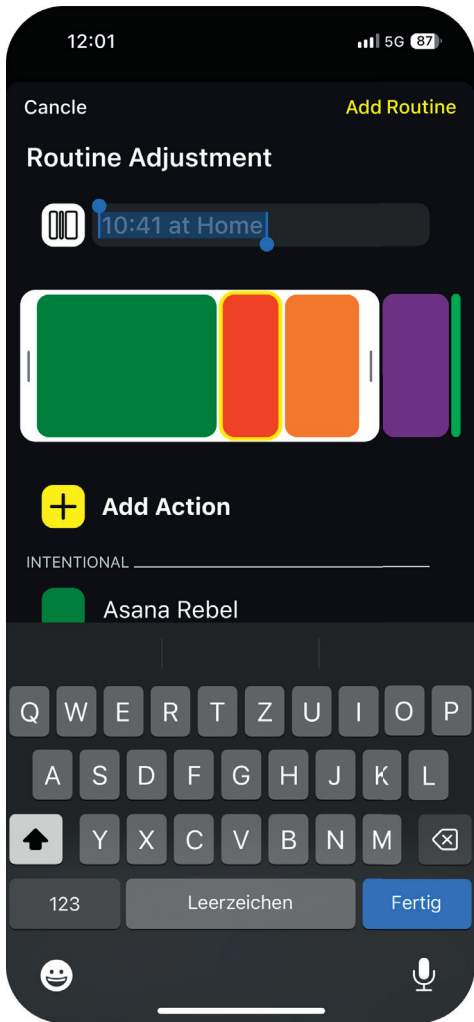
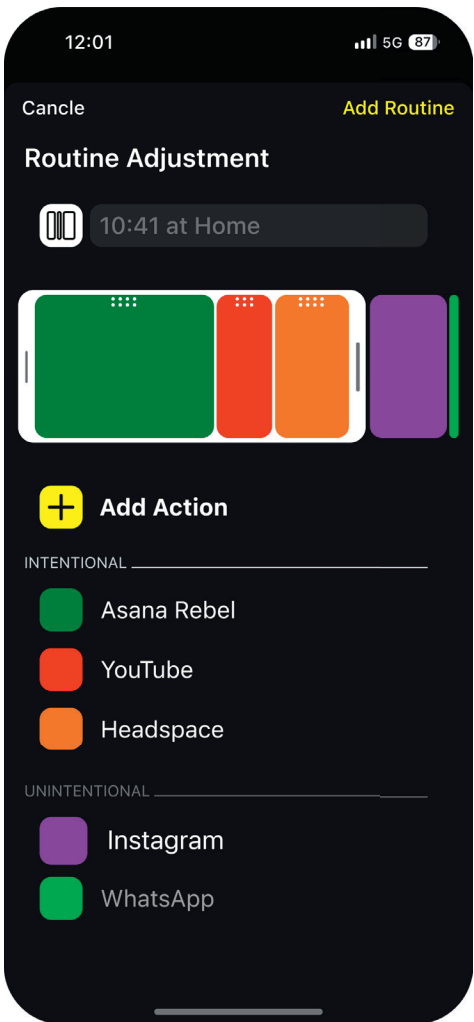
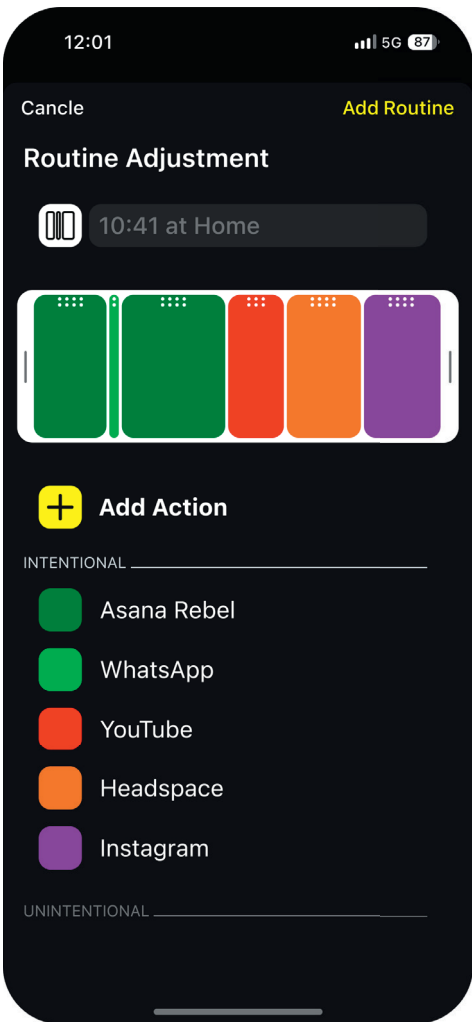
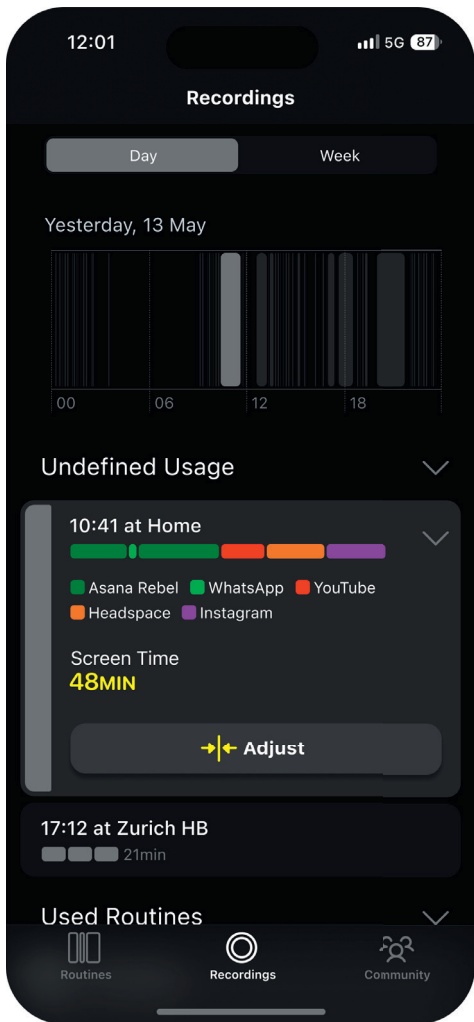


Used Routines

- Messaging
- Business
- Entertainment
- Finance
- Wake Up

Routines Recordings Community





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