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Comfort Away from Home

“How do people find or feel comfort when spending longer periods of time away from home?”

By: Maximilian A Bubenheim

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Abstract

While covid-19 has limited our travels, so many people around the world travel for professional purposes whether they work for a large corporations, on oil rigs, in the military, or in remote research bases. How do these individuals find comfort while they are abroad?

After interviewing two different people who travel for professional purposes it was found that accommodation doesn't provide the best comfort so a product or service that allows you to bring comfort with you could have a huge impact on the target market. Not only could such a product provide comfort while not at home, but also improve productivity and energy levels.

The final product resulted in a small device that you can take on travels with you, providing a customized wake up experience with personalized soundscapes, simulated sunrises, and essential oils that would let you create a wake up routine. These could be similar to the wake ups at home, or completely new environments.

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Part 1

Research Report



Introduction

“With a yearly average temperature of -50 C”, The Concordia Station in Antarctica is located on the “largest desert in the world” with no flora or fauna and 0% humidity (ESA, 2013). At an elevation of 3200m above sea level, this extreme environment can be very unforgiving and is one of the final frontiers on Earth. Supply planes can land here every day in the summer, but in the winter, “when temperatures can drop to -80 C”, no outside help can reach the base for 5 to 6 months, and the “crew have to solve any problems on their own” (ESA, 2013).

How do researchers and staff feel a level of comfort in a place like this? While this may be an extreme example, a large number of people from a range of different career paths may be required to live and work away from home for several weeks or months. Whether you’re working as a roustabout on an offshore oil rig, a scientist in a remote research base, or even as a businessperson on a longer business assignment, they are all exposed to a similar feeling, being far away from family and friends. Some of these jobs may allow you to get home quickly in an emergency, for others they may need to wait until their return journey. How do these individuals develop a feeling of comfort when they are so far away from home and loved ones, and in some cases a risk of death?

If we can find a way to determine and measure how comfort is developed while away from home, we can use the research to create products or services that help other individuals. Of course, given the recent events of 2020 with the Covid-19 pandemic most longer trips have been on hold, except for the people who are stuck on the ISS or

research sites in Antarctica and other remote places. In a world where globalization affects all of us and international collaboration playing an increasing role in many organizations, feeling comfort no matter where you are is critical to ensure wellbeing and creativity.

We will be conducting the research in forms of surveys, interviews and reference other academic papers where necessary. Does nutrition or the job at hand help these individuals with battling the comfort that isn’t felt while at home? Or does the problem lie in the broad range of living conditions from remote research facilities to hotels? How intimate is comfortability and in what subject areas are we going to find the most lack of comfort? Do some of the individuals that stay in these research stations or remote work places share pain points or have similar reactions to what makes living away from home feel comfortably?

“One thing ESO has realized a long time ago, is if you want people to work for you in such extreme environments ... you need to offer them somewhat of a normal life when they are not working” (Interviewee A, 2021). In the image below you can see the ESO Hotel, the place where astronomers, engineers, cooks and other support staff stay in while working at the observatories in Chile. While this area in Chile is definitely worth considering as an extreme environment, at approximately 2000+ meters above sea-level and little to no rain in the past 50 years, with temperatures can be scorching during the day and freezing at night. What makes this place different to other research sites in extreme environments like Antarctica, Svalbard, or even in Space is its access to roads and civilization.

The research bases like the Concordia Station in Antarctica have several environmental hazards that make this architecture impossible. “Elevated types of structures prove most reliable and operable under sever snow drifting circumstances” (Bannova, 2016). Furthermore, the research facilities in Antarctica are usually quite small and built on sleds so that these facilities can be shipped to Antarctica and driven down to the proposed area of operation.

Taking these features into consideration, the weight and cost of these structures are critical to mission success. Similar variables apply to space travel as well. According to ESO, the hotel in Chile cost 12 million Euros to complete in 2000. In contrast, the Concordia Station cost around 31 million Euros to complete and the NASA Space Shuttle program, which built the majority of the ISS over several missions, each costing around 450 million Dollars, (the USD and EUR were worth very similarly at the time). This means that if we want to provide comfort to people in research bases, we

Research Rationale

cannot solely rely on the accommodation, but rather on the services provided within the accommodation, and individual products or services that the individuals can bring with them.



(Fig. 1) I. Werz-Rein, CC BY-SA 3.0 <<https://creativecommons.org/licenses/by-sa/3.0/>>, via Wikimedia Commons

Methodology

Gathering data was achieved with a questionnaire and interviews to individuals in working in these areas. The questionnaire was designed to reach a broader audience to obtain insights not only from researchers but also individuals who travel away from home for several weeks/months at a time. These people may include military personnel, offshore oil rig workers, cruise or container ship employees, or employees on long-term business trips. All of these individuals have in common that they can spend several weeks away from home, and may not have a feeling of comfort, therefore affecting their mental health and productivity.

Several academic papers were also selected to form a basis of background knowledge. Since only a handful of people actually went to the International Space Station or the Concordia station, I decided to find knowledge in these areas through academic papers, rather than relying on primary research. This is important since, as mentioned above, the ESO observatories in Chile are also specified as “extreme environments” but since its more accessible there are stark differences between various research bases depending on their accessibility to civilization.

Two interviews were conducted for this research. The first interview lead with Interviewee A, an operations lead at the ESO observatory in Paranal, Chile, provided insight on how the research base operated there. Astronomers travel there for up to a few months to observe the stars and other celestial bodies. While not as remote as

arctic research bases, the extreme environment of the Atacama Desert is still demanding and harsh.

The interview with Interviewee B was a strong contrast to the first and uncovered the life of a long-term business traveler. Interviewee B is a financial accountant working for a international media conglomerate with offices in several major cities across the world. Interviewee B spends a lot of time on business trips for his job, mostly in New York City, often spending as much as two to three months on site, living in hotels and working away from home.

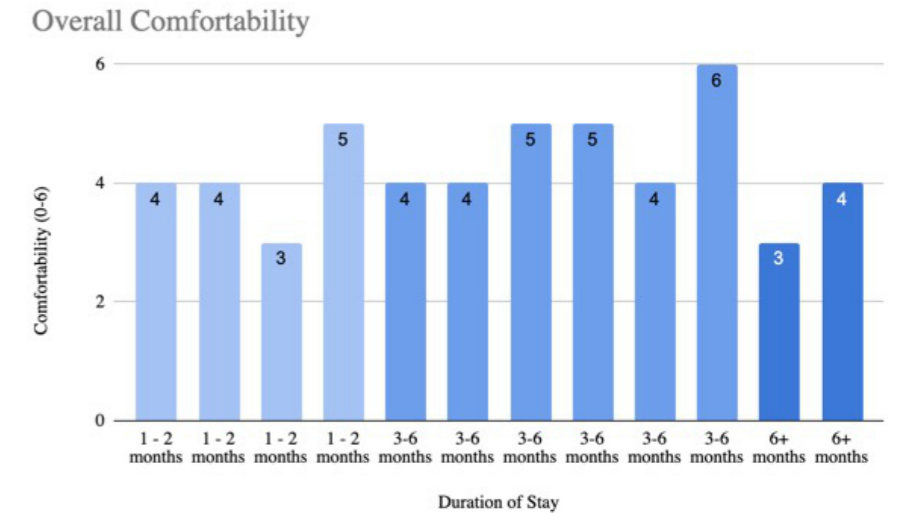
The questions in the questionnaire shared some similarities to the questions in the interviews. This was to discover if the individuals documented from both mediums share similar points. My hypothesis is that it doesn’t matter if you stay in a hotel, a ship cabin, or a windowless room in the arctic, if you are away from home, you are going to miss things that give you the desired comfort. What are these things that you miss, and what induces these feelings? Some of the points that the questionnaire and interviews were designed to uncover include:

- How comfortable are your stays away from home?
- What aspects of the trips help you feel comfortable?
- What motivates you to travel long-term again?

Findings

Duration & Overall Comfortability

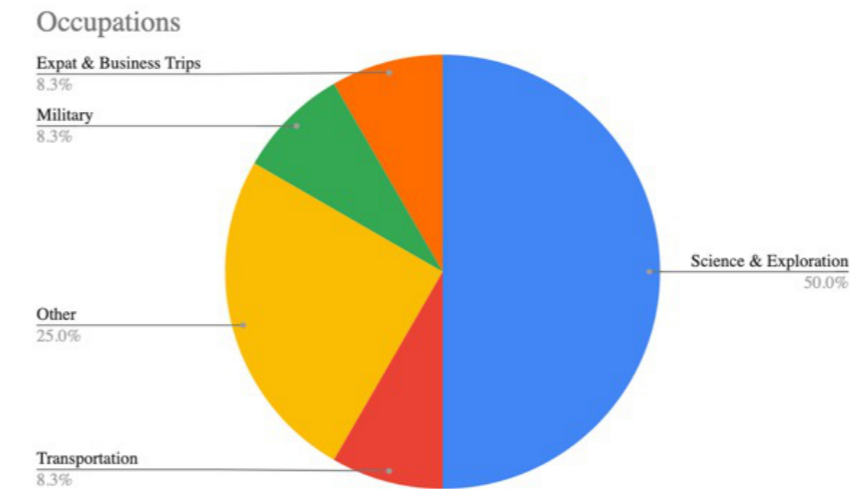
In the following chart (fig. 3) we can see the individual responses of their longest travel periods alongside the comfortability they experienced while on these trips.



(Fig. 3) Duration of stay vs. level of comfortability

We can see that the comfortability during the “1-2 month” stays averages out to around a 4, but then increases during the “3-6 month” stay. Then once we reach the “6+ month” duration the level of

We will begin by analyzing the data from the questionnaire. After reviewing the data, we will split up the results into two separate parts. Part 1 will analyze the data based on the duration of their stays and their comfortability during these trips. This is because we have a range of different occupations from the questionnaire results, making the duration of trips the variable of comfortability. Part 2 will review the individual categories that made people feel more comfortable and what motivates people to travel again. This part applies to all occupations regardless of the duration of stay. Figure 2 demonstrates the overall occupations of the people who participated in the questionnaire. In total, 12 people participated.



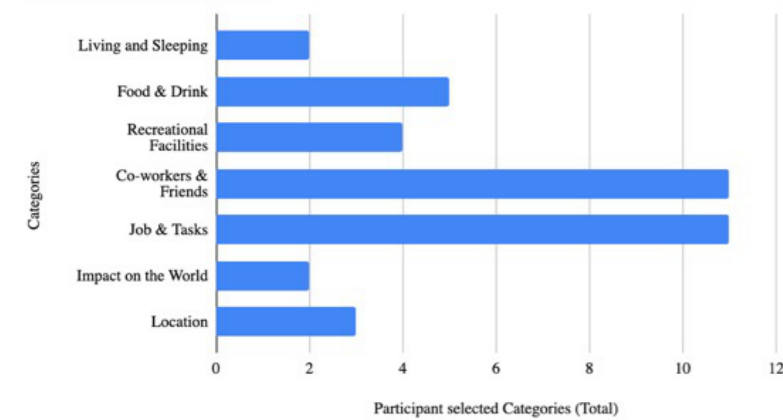
(Fig. 2) Occupations participating in questionnaire

comfortability drops back down again significantly. Interestingly we can see that no one was very dissatisfied with their traveling, having received no answer below a level 3. This question had an even number of values so there is no average answer, so every participant had to choose either a 3 (less or comfortable) or 4 (more comfortable) value out of 6.

Comfortability Categories

The next part of the questionnaire was a series of questions asking which aspects in particular made the participant feel comfortable during the duration of their stays (fig. 4) and what would motivate them to go on more of these trips in the future (fig. 5). This allows us to see what they enjoy during their stay at the moment, and if the factors that motivate them to travel again match with what they already enjoy, or if these are new factors to take into consideration. Participants were able to select numerous answers.

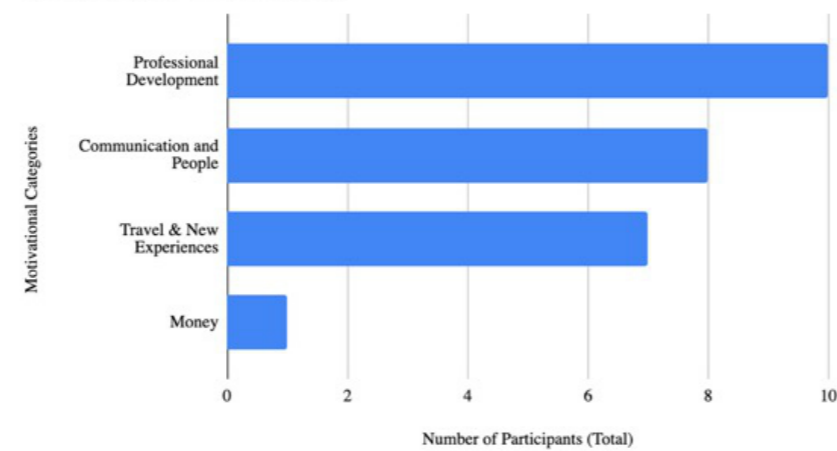
Comfortability Aspects



(Fig. 4) Comfortability Categories

We can see in the chart above that almost all participants valued their comfortability in the job that they complete on site and the co-workers or friends they may be in contact with. Other participants also particularly enjoyed the food or the recreational facilities.

Motivation to Travel Again



(Fig. 5) Motivation to travel again

After breaking down the short answers to “what motivates you to travel again”, four categories were created. These can be seen above in figure 5. We can see that many people will travel more to build their “Professional Development”. Another strong category is “Communication and People” which coincides with the results from figure 4. We also have a group of people who are interested in traveling to new places and discovering different cultures.

Interview Analysis

As mentioned before, two interviews were conducted for this research. After analyzing and dissecting these, several major themes became apparent that both interviewees talked about. These themes are important because some of them tie into the research found in the questionnaires. This also means that although both interviewees come from different backgrounds, there are similarities between normal business trips, research trips and other occupations requiring travel for longer periods of time. The themes discussed in these interviews are:

- Food & Living
- Psychological wellbeing
- Human interaction
- Outlets
- Time zones and work hours

Discussion

Now that we have dissected our research, we can start looking at the questionnaires, interviews and how it all fits together. Starting with figure 3, “Overall comfortability” we can see that the lowest comfortability is situated in the “1-2 months” period and the “6+ months” period. It is possible that the “1-2 months” time period is when the business trips aren’t so long, and the individuals stay in a hotel rather than fixed accommodation. This argument would be backed up by Interviewee B who spends the majority of his trips in hotels for 1-2 months. During this interview he repeatedly mentioned how negative the traveling experience can be, especially when traveling alone. His arguments were that you would work during the day, and most people from work would go home to family in the evenings, leaving him to explore New York City by himself. He says that during these trips, most of the things you do are by yourself, except for the occasional business dinners (though these would usually take place during shorter business trips).

During the “3-6 month” periods the individuals would either be given an apartment to stay in (for cost purposes), or be given accommodation on site, as Interviewee A mentioned, the case at the ESO observatory in Chile. This gives individuals a more “intimate” environment and may even be around co-workers, allowing them to socialize and feel more at home. However, staying in these accommodations for “6+ months” might make some people simply “go nuts” as Interviewee A put it. At the ESO hotel, people can stay a maximum of two weeks at a time at the accommodation, before taking

a three-day break in the nearby city of Antofagasta, Chile. This policy was put in place by ESO to protect the psychological wellbeing of its employees. Working for more than 6 months in a single place away from home can be very trying, especially when you are far away from civilization and especially family and friends. In the ESO hotel, all you have around you is desert and observatories, so even the eyes aren’t given much variety, even outside of the accommodation.

In figure 4 we can see that almost every participant in the survey said that the “Co-workers and Friends” and “Job and Tasks” helped them feel more comfortable while traveling. This lines up with what both the Interviewees mentioned in the interviews as well, like “Human interaction”, a major theme in both interviews. The types of human interaction mentioned in both interviews were different though. Interviewee A valued the moments of sitting together in the cafeteria and physical meetings with people as a way to connect with them. This was something that he felt was difficult to do over a zoom meeting where you don’t get the same level of connection with a person. Interviewee B on the other hand valued the short interactions with his co-workers, like “meeting at the water cooler, the coffee machine or in the elevator” that trigger invaluable insights or questions.

The “Job and Tasks” category chosen by many may come from their passion to their job. If people didn’t like what they did, they probably wouldn’t commit to long business trips. Whilst talking to Interviewee A about choosing new image sensors and tech for the observatory tools you noticed a certain passion in the field. Many people also mentioned “Professional Development” as a motivation to

travel again. Even after reading “Endurance”, a book from Scott Kelley, a former astronaut, and one of the only two people to spend a year in space, he didn’t do this simply because it was his job. He went to space and risked his life because he was passionate about it and felt that everything he did was for the interest of humankind.

Interviewee B mentioned “Outlets” numerous times during our interview. The ability to go and do something or relieve stress when you’re not at work. Whether it be at the gym, a bar, a cinema, or a library, these outlets can provide a level of comfort as these places that we have access to when we are at home. We hear about these outlets in hotels, the ESO accommodation, and many other places. As mentioned beforehand, the weight and cost play a large role in the modules in the arctic regions and space station, yet we will still find outlets in some form or another on these bases as well.

The last and final theme that was present during the interviews was “Time zones and Work hours”. This area was particularly interesting because it seemed to play a large role especially for business travelers. There are three main areas to which this topic applies:

- Short-term international business trips
- Jobs that have nocturnal working hours
- Jobs that take place in areas with midnight sun and polar nights

Some accommodation types that house nocturnal workers or are situated in arctic regions battle this phenomenon with completely dark or windowless rooms, there are still several issues that arise from this.

Conclusion

The area of “Time zones and Work hours” needs more research before we can reach a conclusion. Arguably certain colors, sounds, or smells help induce sleep or waking up in your home environment. These are hard to replicate if you spend many weeks or months in accommodation designed for a variety of people. However, this theme also has room for innovation. How can we ease people in a new country with a new schedule to provide a better transition period? Can we design a product or service that can help mimic the time zone or the feelings experienced at home, therefore providing more comfort?

After reviewing the data collected from questionnaires as well as interviews, there are three main areas that provide comfort to individuals on long trips. These are “Food & Living, Human Interaction, and Outlets”. Organizations have done much to cater for these areas, providing variety on the food menu, services to relieve stress, and areas for you to interact with others.

The main issues about these accommodations regardless if provided by hotels or companies is that these rooms may attempt to look nice but ultimately are streamlined to cater to all. A hotel will get a new guest in the room the moment the business traveler leaves. The ESO hotel will host a new astronomer when the person leaves, and the Concordia station will house a new researcher once some of them go home. This means even if these organizations try to replicate an intimate environment, we will never truly feel the comfort of home in these place because comfort is individual to the person. Places like the ESO observatories or the space station require you to work 7 days a

week. These accommodations might offer an abundance of services because they are aware that they cannot offer the same comfort that you may feel at home. In doing so, they are at least able to keep guests busy, and provide a fraction of the comfort that the guests are used to at home.

Part 2

MFA Design Project



Introduction

As discussed in the previous section, the main problem with accommodation for travelers is that the experience is designed to suit a variety of people. Obviously many resources or innovations are needed to create a truly unique and personal experience for everyone using the accommodation. This is the case for international business travelers, the astronomers at ESO, the roustabouts working on oil rigs, and many others. How can we use the knowledge we have gained from the research and combine it with design to create a personal experience for these travelers?

To approach this problem we will focus on one of the above mentioned themes. We will call these Comfort Creators, as things or environments that give us comfort on our trips abroad. Many of these Comfort Creators can be improved through the link of a healthy sleep cycle and routine. Consistent sleep duration and wake up habits reduce stress, improve moods, and help us make better decisions. We learned in our research that one of the core reasons of traveling abroad for work is to personally interact with our colleagues across the globe, which is a lot easier to do when your body has the energy it needs. If its possible to design a service for healthy sleeping and comfortable wake up habits, then it could be beneficial for many people, especially those in demanding work environments like oil rigs and research stations.

The business travel industry was worth a whopping \$504 billion USD in 2019 (pre-COVID-19). While many industries started utilizing online collaborative tools to communicate with their global counterparts, oil rig workers, scientists and military personal either continued their travels or were stranded in their employment accommodations until given the opportunity to return home. Working from home may have allowed many individuals to have a better *psychological wellbeing*, access to *outlets*, or more desired *living* situations, but many individuals didn't have this luxury in their line of work. Even if COVID-19 allowed us to revolutionize online interactions, many industries still rely on the *human interaction* and will continue to do so in years to come.



<https://unsplash.com/photos/Oalh2MojUuk>



Accommodation for travelers on business is not designed to be used for a wide variety of peoples at the expense of individual comfort. We know from research that healthy sleeping patterns and wake up times support mental health, energy levels, and human interaction throughout the day.



The global business travel industry was worth \$504 billion USD before COVID-19 struck the rest of the world in early 2020. This number does not include oil rig workers, military personal or researchers. While the world has revolutionized online collaboration during the pandemic, many industries will continue traveling after the pandemic is overcome.



405 million business trips are taken annually just in the united states alone. These individuals will travel around 12-14 times a year with an average of 4-6 nights spent away from home. Improving their sleeping pattern and increasing their productivity would influence their well-being during these trips and give international companies more peace of mind for their employees.

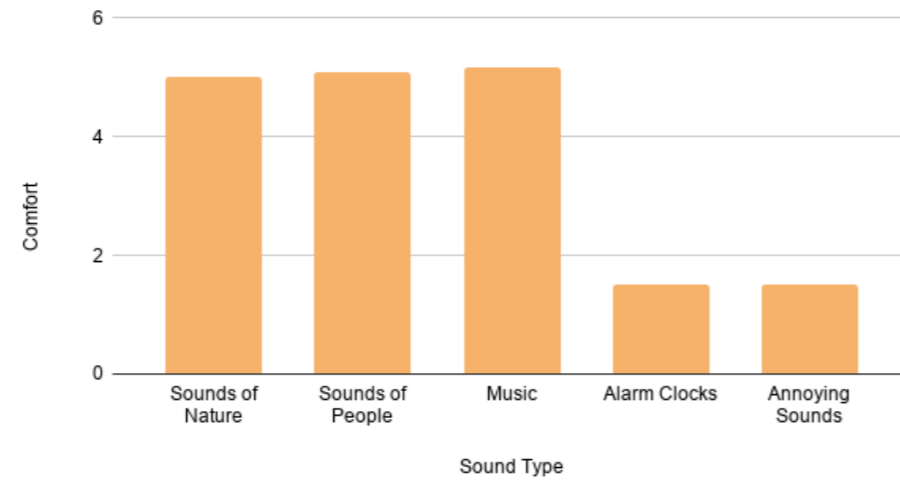
Survey Analysis

When we think about alarms, many of us use our smartphone that lies next to the bed. Some of us only need one alarm, others have alarms that go off every 5 minutes until they wake up, while others use wake up lights which mimic the sunrise which also boosts energy levels during the day. Some people have partners, pets or coffee machines that help them during the wake up cycle. These things are Comfort Constants since they constantly help us induce comfort while we are at home. While most smells don't tend to wake us up, they can be associated to a specific event or emotional memory which recreates certain responses when you encounter a similar smell in the future. Some people use aromatherapy to help them fall asleep, which uses the exposure of a certain smell to help their brain associate it with sleep. Is it possible to create a wake-up experience using a multitude of these senses that remind us of our comfort at home, and if so how do we achieve this? To begin looking for answers to these questions a survey helped discover if sounds, smells, and colors induce comfort and how much effect they have.

Sounds

The first question asked respondents what sounds they use to wake up in the morning, and how comfortable this sound is to wake up to (on a scale of 1 - 6). The results were then filtered in to categories and depicted on the following chart. We

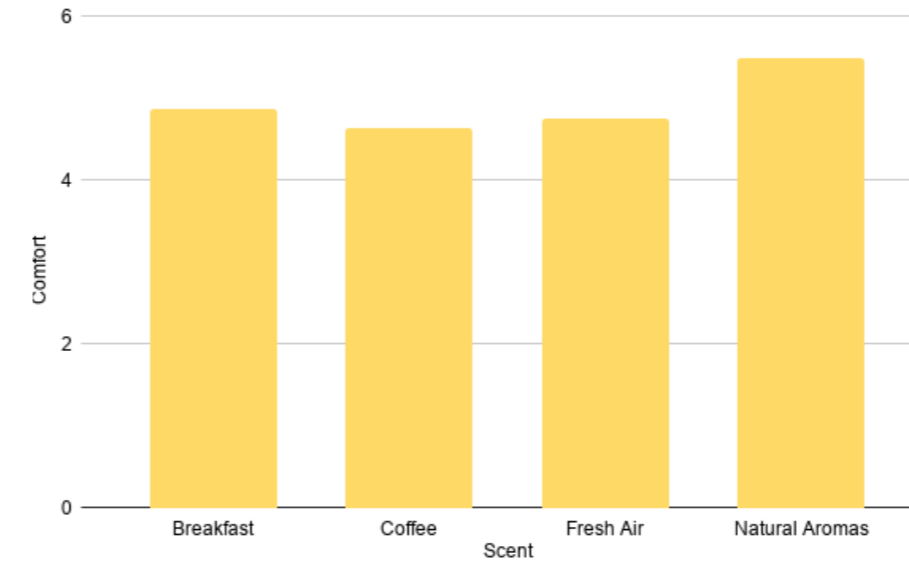
Comfort vs. Sound Type



can see that *Sounds of Nature*, *Sounds of People*, and, *Music* induce the most comfort whereas *Alarm Clocks* and *Annoying Sounds* like beeps and construction noises induced the least comfort. Some sounds that tended to distract people from the feeling of comfort were construction noises, various beeps and high pitched alarms.

Smells

The next category that was investigated was the area of smell. As discussed earlier we know that smell isn't usually directly responsible for waking you up, but rather that the brain creates an emotional memory that is associated to that smell.



Some people use coffee machines that brew coffee at a specific time in the morning which releases an aroma. If it is possible to recreate this aroma within a wake-up experience then we can train the brain to associate that smell to the action of waking up. As we can see, the smells that induce the most comfort in people are the smells of *Breakfast*, *Coffee*, *Fresh Air*, and *Natural Aromas* like fresh cut grass. The results can be seen below.

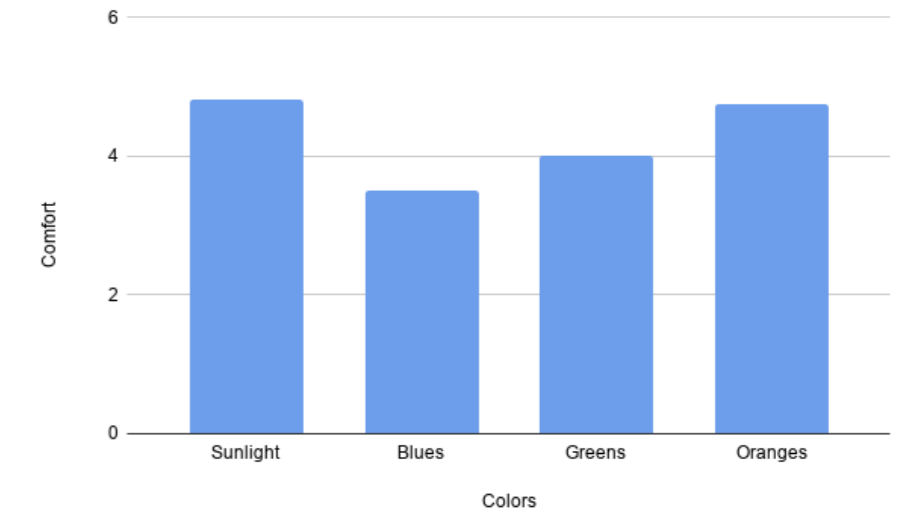
Smells provide a high level of comfort to wake up routines, especially *natural aromas*. Since smells alone aren't likely to

wake you up from your sleep, a question regarding smells that don't induce comfort was not asked in the survey.

Colors

The next question that the survey focused on was the color that induced the most comfort in people during their wake up. Most people replied with *Sunlight* inducing the most comfort although *Blues* and *Greens* can also provided a level of comfort to many people.

There are many health benefits to adjusting your body to your circadian rhythm like higher energy levels in the morning and other important functions like digestion and hormone release. Of course not everyone lives in an area where the day and night cycle is easy to follow. Falling asleep at night is easy when its dark, but we close our blinds so we don't wake up too



early in the morning when the sun comes up. Fortunately many products exists that mimic the sunrise by lighting up our rooms over the course of 30 minutes, tricking our brain to believe its the

sun. This technology is very useful for people living far in the north or south, but also business travelers who have arrived in another country or employees that work in an environment where they don't see much sun.

Some colors that respondents felt less comfortable with waking up to included blacks, grays, neons, blues, and reds. This shows that there is no real need for a wake up light to be able to show more colors than just the colors occurring during the sunrise.

The rest of the survey was focused particularly for business travelers. The questions asked about the comfortability of the accommodation during the business travels, to which the average answer resulted in a total of 3.8/6. When asked if they believed their routine and productivity would be improved if their comfort did too 91% agreed with this. We can conclude that the comfortability of business travelers can be improved, and as a result, their productivity as well. This reflects the research we have conducted that showed healthy sleep patterns and wake up routines have a strong connection to our health and energy levels throughout the day. Whether you are traveling to Asia for a week to collaborate with colleagues, or going to Antarctica for a few months to work on revolutionary climate research, there is a need for service that can boost your productivity while also providing the feeling of home you may be missing.

Lastly, sleep tracking technology was considered. However, it usually requires a sensor to be worn on person, and a bed sensor could be too much work for users to actively use it if they aren't staying for long. After a small survey was held, 93% of users said they did not feel comfortable if they had to wear technology during their sleep. Furthermore, sleep tracking works by waking you up during a time of light sleeping, which might occur before or after your preferred wake up time, allowing the need for wiggle room in wake up schedules. After the interviews it was made aware that a reliance to technology

keeping you on schedule is important, so focusing on a comforting product that will wake you up "by" a certain time rather than "around" a certain time was the better option.



Most people find that sounds of nature, sounds of their partners or people around them, or music induce the most comfort during their wake up. While alarm clocks and other annoying sounds like dishwasher beeps or construction noises outside induce the least amount of comfort.



Smells generally aren't strong enough to wake us up, but we can associate events or emotions with smells, so we can train our body to react a specific way with them. With the smell of BBQ we feel hungry, when we smell gas we might feel uneasy, and some of us get a wake up boost when we smell coffee.



Most of us feel the most comfortable when warm colors flood our rooms with light, especially when they come from the sun. Wake up lights allow us to mimic that feeling by creating an artificial sunrise, which helps start our circadian rhythm, and in turn gives us the energy we need in the morning.



The survey shows us that 91% of the participants believed their daily routine and productivity would increase if they woke up to a more comfortable environment during their stays abroad. This also means that 91% of the participants probably don't have a comfortable wake up routine when they are on their travels.

Identified Issue

The existing alarm clocks that we use when we travel abroad are usually just the smartphones in our pocket. They have a limited set of features, and wake you up with a loud noise which can raise your heartbeat and doesn't allow your body to wake up naturally. If we consider existing research on wake up lights, our circadian rhythm, and their positive impact on our routine as well as our own research, we can deduct that there is a market for a more comfortable portable wake up experience.

In our survey we discovered that 91% of the participants said their routine and productivity would improve if they woke up more comfortably. This means that 91% of the participants probably don't travel comfortably already.

Brief:

To design a service for individuals that travel abroad for work, which promotes healthy sleeping habits and provides more comfort during their time away from home.

Market Research

Wake up Lights



Philips Wake up light

Cost: 1599kr - 2799kr

Philips has the highest marketshare in wake up lights at the moment. They have extensive research on its benefits and as a manufacturer of lightbulbs they have lots of expertise in this area. They are not connected via bluetooth, have limited sounds to wake up to, and user feedback mentioned not-so-great speaker quality. They also are not portable.



Other Wake up Lights

Cost: 200kr - 1500kr

There are many other companies that are also creating wake up lights. Some can connect via bluetooth, and the quality varies from really low, to quite nice. None of these are portable.



Diffuser Wake up Lights

Cost: 200kr - 1000kr

Some Wake up lights with oil diffusers exist, however, they are chunky, and tend not to have a nice aesthetic. They are also not usually bluetooth connected and as with the other wake up lights, the customize-ability is minimal.

Technology Research

Oil Diffusers



Heat

In this method, oil is heated up and gradually released into the air. Sometimes water is combined with the oil but creates a less potent aroma.

Pro: Silent and Efficient

Con: The heat can potentially alter the scent if its too hot



Evaporative

Tissues or pads are doused in oil and a fan blows air through these, dispersing the oil into the room

Pro: Silent and quick to work

Con: Less potent fumes are released first and over time the more potent fumes



Ultrasonic

Ultrasonic vibrations are created under the surface of a water and oil mix to break the oil into micro particles and be released as a mist

Pro: Silent and only uses a small amount of oil

Con: Mist created does not include a lot of oil



Nebulizer

A pressurized stream of high velocity air is pushed into the oil which in turn creates a fine mist which is dispelled into the air

Pro: Doesn't use heat or water, very concentrated scent

Con: Devices are usually more expensive and more oil to refill is needed

Target Users



Name: Mario van den Anker

Age: 51

Occupation: Astronomer at European Southern Observatories (ESO)

Mario van den Anker is an astronomer at ESA who spends most of his time in Garching, Germany at the headquarters of ESO. About 1-4 a year he travels to Antofagasta, Chile to venture to the Atacama Desert or around the world to astronomy related expos.

The trips to Chile can last from a few weeks to 3 months and are usually spent at the ESO accommodation working nocturnally 7 days a week, for 2 weeks before getting a 3 day break in a nearby city. On these trips he is looking into the cosmos on the telescopes or collaborating with his colleagues who are also staying there. While these accommodations try to be as comfortable as possible, they are still designed to be used by everyone.

“The bedside tables are really small.”



Name: Alexa

Age: 31

Occupation: Researcher at ESA

Alexa is a researcher for ESA who will travel to the Concordia Station at the south pole to conduct climate related research. She will be staying here for 5 months in the summer, during which the sun never sets. Since the staff on the station still follow a day-and-night schedule, the rooms can be completely dark



Name: Sarah

Age: 36

Occupation: Employee at an international company

Sarah is an employee at a company that has offices all around the world. When she is not working at the offices in London, she is elsewhere in the world for a week, collaborating with her colleagues at the other locations. She travels about 1 week per month and expects to continue to do so when restrictions from covid-19 are lifted.

Design Limitations

Designing a product that will be used by business travelers means that there are several factors that need to be considered. Some of these things include:

- The shape, size, and weight of the product
- Making sure it doesn't cause problems at airport security checks
- Its durability, should it experience any knocking around during transit

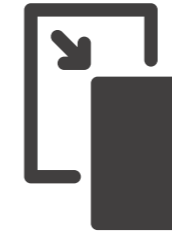
The size and shape play a very big role in this kind of product since it determines how well the product will fit into the carry on luggage of business travelers. If the form doesn't fit into their existing travel luggage, along with the other items they bring with them already, the product will likely stay at home defeating its purpose. For this reason, weight also plays a role, but since we will focus on efficient and small shapes that will fit into existing travel bags. The focus of this product is to show the users that the extra few hundred grams of this product are worth it.

Another main concern to consider, is the impact of the product when it comes to Transportation Security Administration (TSA) checks. Since business travelers are in airports often, these checks are regular routine so they know how to pack their gear to ensure they get through the security check as quick as possible. The laptop and iPad is ready to be pulled out, the pockets are cleared, belts removed, liquids sorted properly and boarding ticket at the ready. Unlike more casual travelers who might have a stowaway water bottle deep underneath their clothes causing longer waiting times for everyone. Since the product will be using oils to provide scents

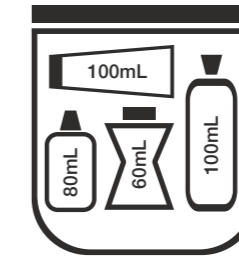
during use, its important to design diffuser in a way that the oil can be added to the liquids bag quickly and efficiently. The product should also be free of any sharp objects, and look like something familiar. This is because unknown objects are more likely to be checked separately by the airport staff which could cause unwanted delays for the traveler.

Another factor that the product might experience is being knocked against other pieces of luggage in the overhead compartments on the plane. This means that the product should be as durable as possible to ensure that it arrives at the destination and back at home in one piece, and ideally without a scratch.

We should also consider that this is a device to inspire comfort and is used mostly during the sleeping hours of the day. This means that we want to make sure that the product is aesthetically pleasing and suitable to a variety of audiences no matter the traveler and their origins. Ensuring that the product is designed to induce comfort while being durable at the same time will result in some interesting ideas.



Carry on luggages are small, especially when filled with a laptop, iPad, books, headphones, and clothes. More space to keep yet another addition to the load-out is limited. Furthermore, night stands at accommodations can be small and already filled with other items, this product needs to ensure its as space efficient as possible.



A maximum of 1 Liter of liquids is allowed per person on a flight. These liquids must be divided into containers no larger of 100mL each, and must be placed into a sealable plastic bag. This bag is then to be removed from the carry on luggage and placed on a security check tray.



While the product will primarily be used next to the bed, the product will be put into the bag along size books, laptops, iPads and clothes. Furthermore the bag in which it is in may get tossed around during transit so the product should be durable enough to take a small beating.

Design Process

Along with the previously mentioned design limitations, considering the various components that would find themselves in the product also determined the starting point for ideation sketches. The components that need the most space include the wake-up light and the oil diffuser. The other components like speakers, microphones and batteries would be easier to integrate since they are smaller and sound good even when built small enough for smartphones.

An interesting aspect to consider is the orientation of the product, since an oil diffuser will only work when placed the right side up. This means that product will need to have a designated orientation that is visible to the user, but also doesn't seem to be restricting to the design. Naturally, a cylindrical form comes to mind as it can only be orientated upright, laying it on its side would cause it to role. Other initial thoughts included oval shapes and flatpack designs.

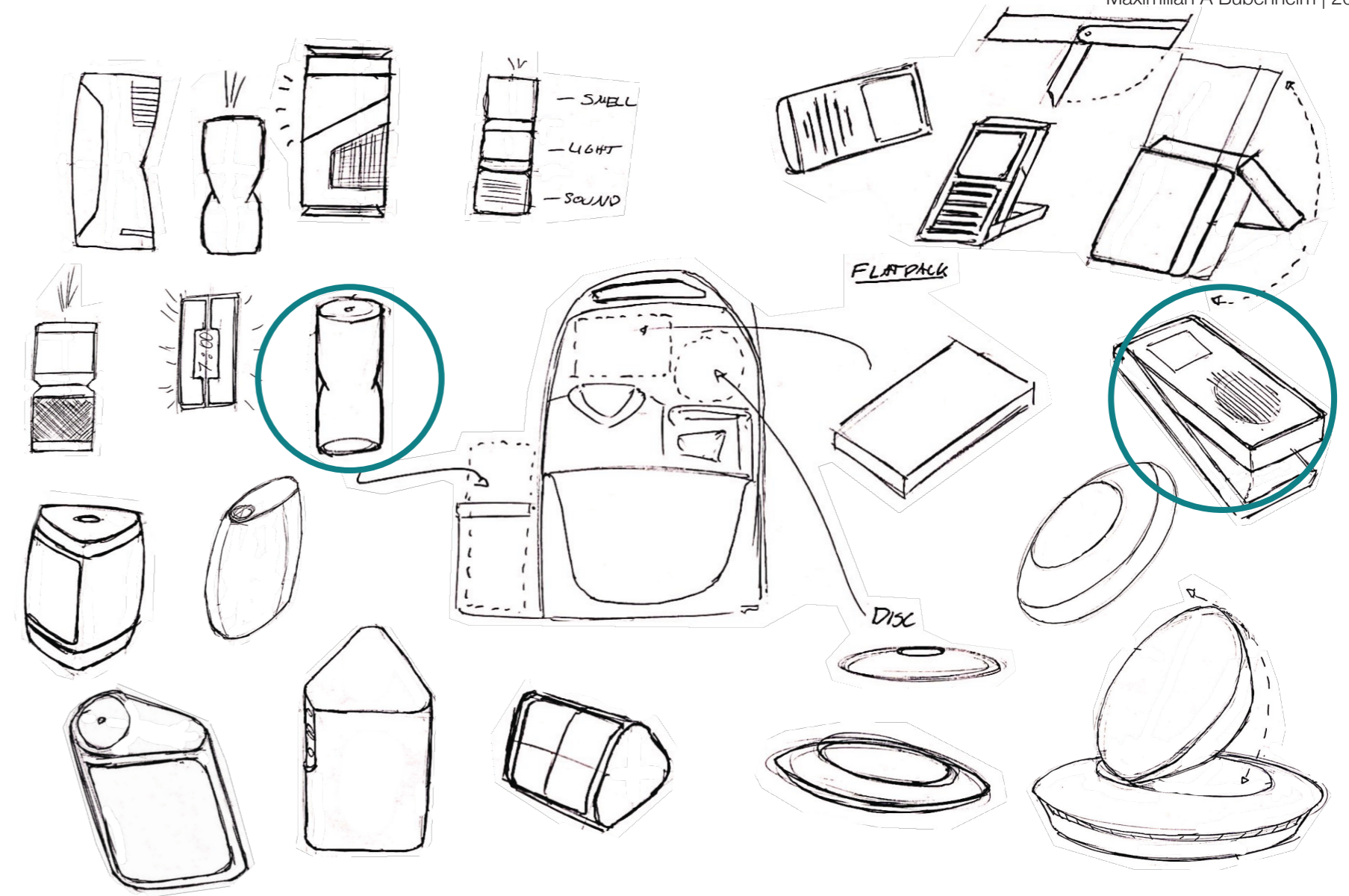
Cylinders are aesthetically pleasing and space efficient shapes. When used in combination with speakers they can allow for 360 degree sound and their vertical orientation would allow an oil diffuser to fit well in the center of the design. However, since we are working with quite a small product, we want to direct as much light as possible towards the user to get the most out of the LEDs. With a cylinder there is no clear direction of which part should point towards the user and if we have a light diffuser around the entire circumference we might

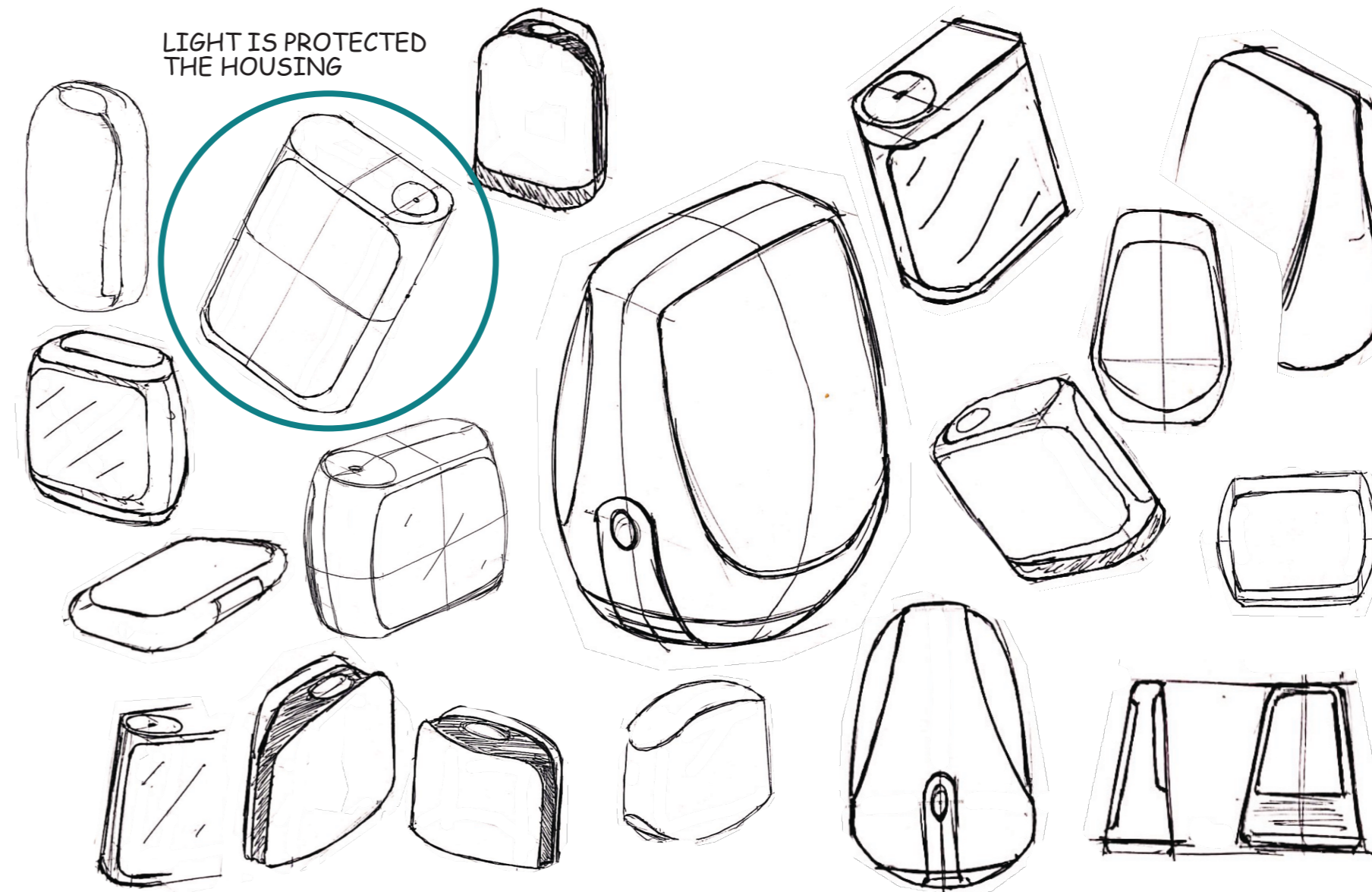
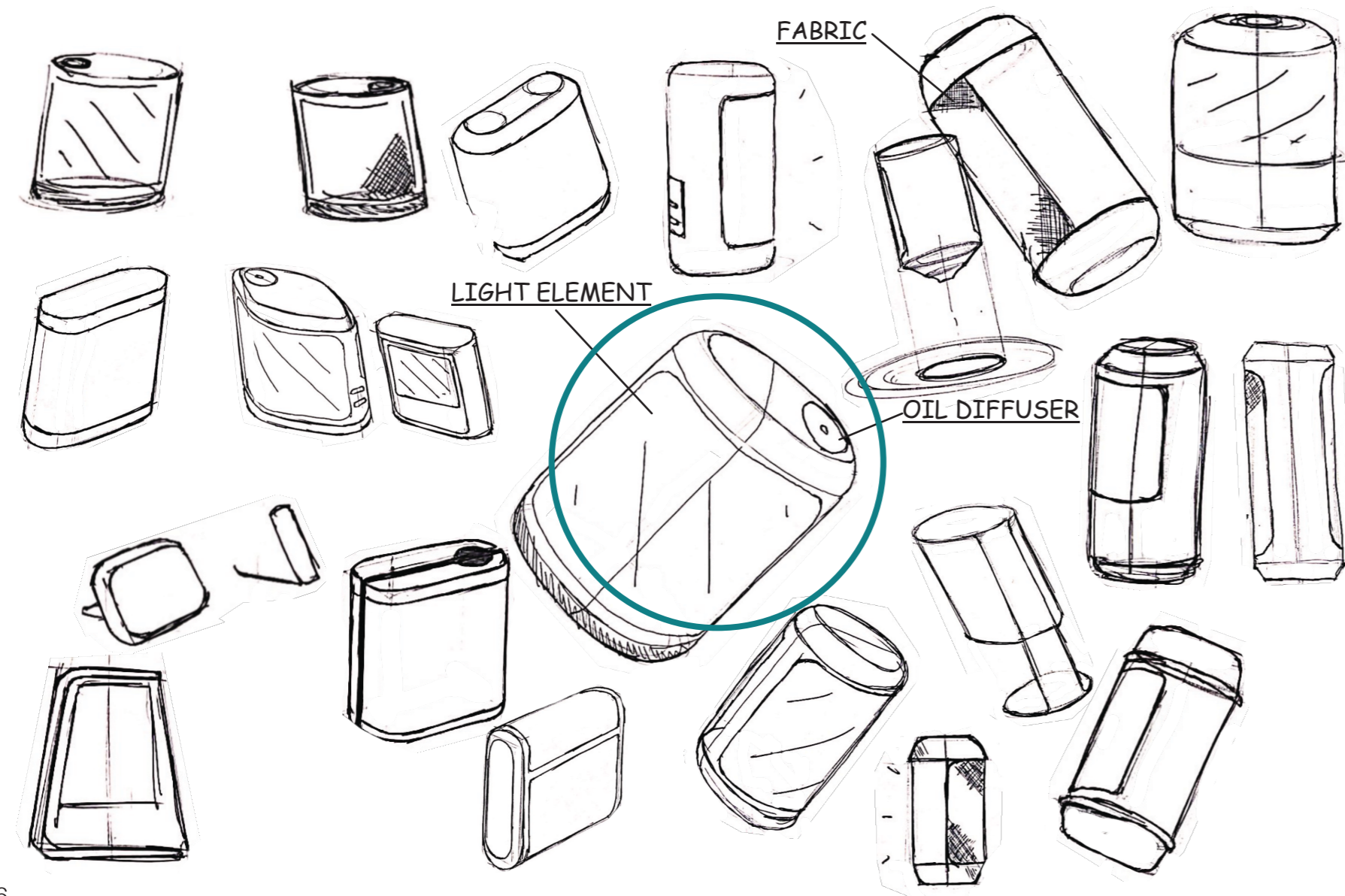
lose light to places we don't want it to go. Furthermore, cylinders have been used for almost every single bluetooth speaker in the last few years which takes away from the originality of the product.

A cylinder with an elliptic vertical profile on the other hand would provide more surface area of light to be directed towards the user. They provide many of the pros of cylinders but would result in a refreshing shape to the market.

Flatpack/Rectangular designs on the other hand have the best space efficiency at the expense of subjective aesthetics. A main issue could be that product orientation could be mistaken and lead to bad experiences. A foldable design could add to the surface area but provide room for wireless charging of your phone.

With a variety of shapes to choose from, ideation began but there was no clear direction. Further research had to be made to ensure the product was on the right path. This led to another survey being distributed exclusively towards business travelers with more in depth questions of the product shape and the general aesthetics.





Interim Survey & Interview

In this survey my main focus was to get feedback of my concept from business travelers, rather than asking a general audience how they wake up comfortably. Alongside aesthetic questions, the survey also asked if the business travelers would use the product themselves, purchase it themselves, and if not, use the product if it was provided by their employer. This survey provided essential replies that led to the final design.

The aesthetics part of the survey asked users if they preferred a cylindrical or rectangular shape. In order to provide more context images were used to describe the shapes of:

A. A small bluetooth speaker

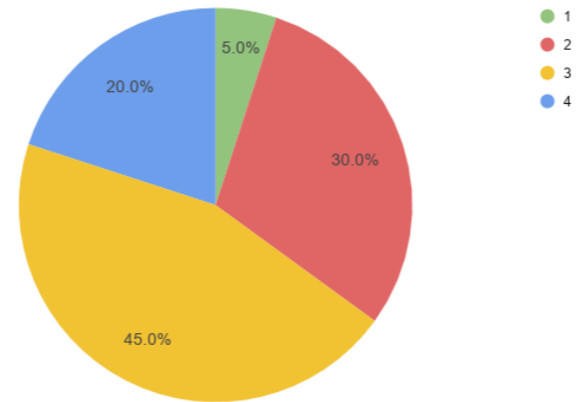


B. A 200-300 paged book



To which 60% of the respondents replied with option B. When asked if there was any other shape they'd prefer, some noted down that the footprint of the product should be as small as possible. The next aesthetic question listed a series of four

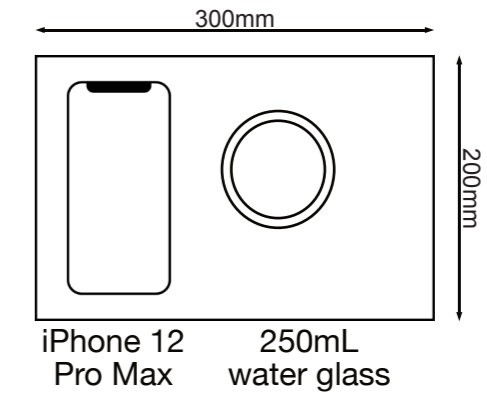
images showing different interior design styles and which induced more comfort. The images can be seen below:



As we can see in the pie chart, the majority of the respondents chose option 3 at 45% while option 2 is at 30%. This shows us that most of these travelers prefer a utilitarian aesthetic and the other travelers prefer the more Scandinavian aesthetic. A reason for these results may be the large amount of male participants (85%), while the other 15% were female. Of course the product would include multiple color ways to cater to a variety of travelers, but this part of the survey helped me understand that the focus on raw materials such as woods, metals, and leathers was associated more to comfort than the minimalistic design.

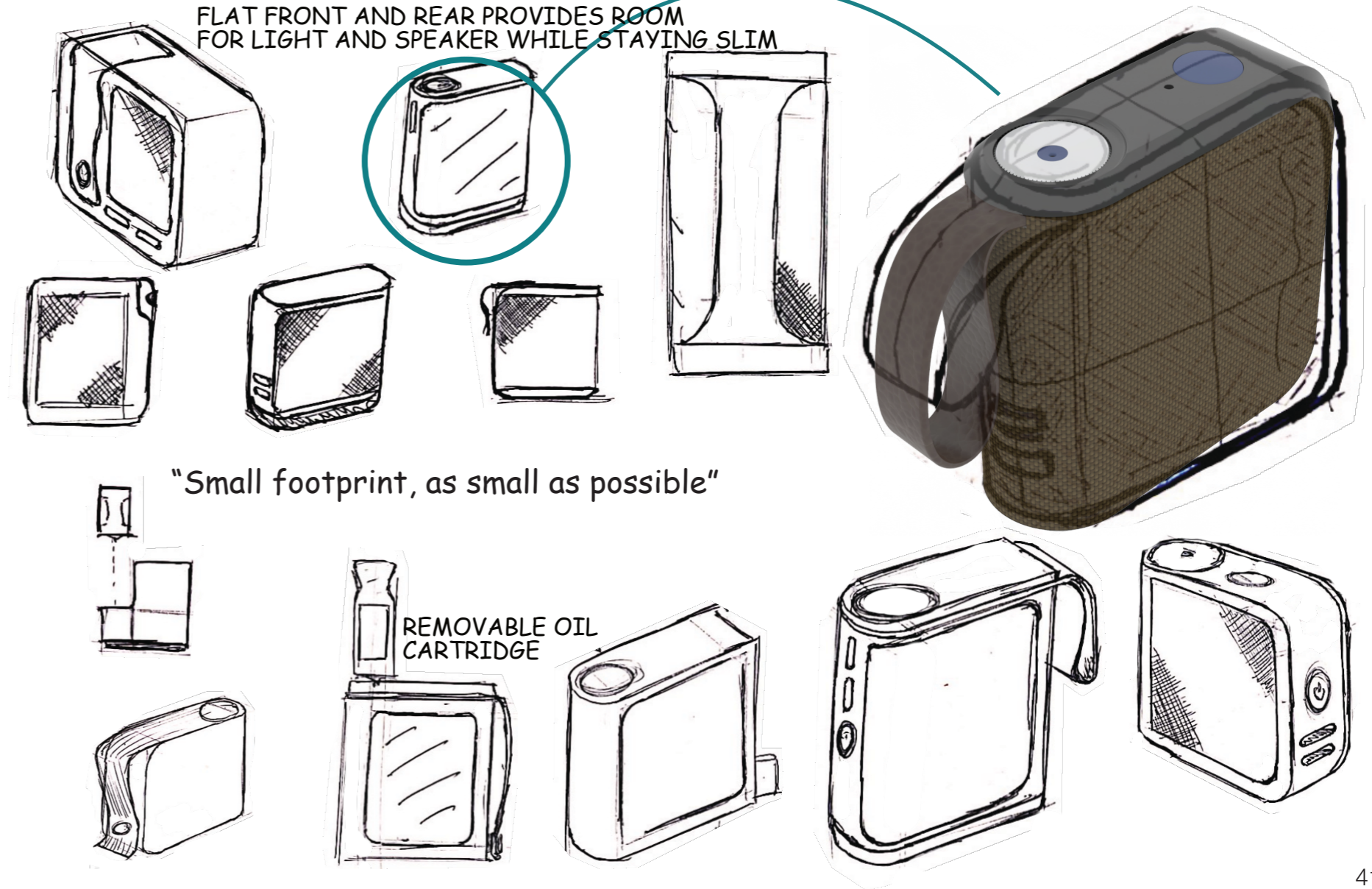
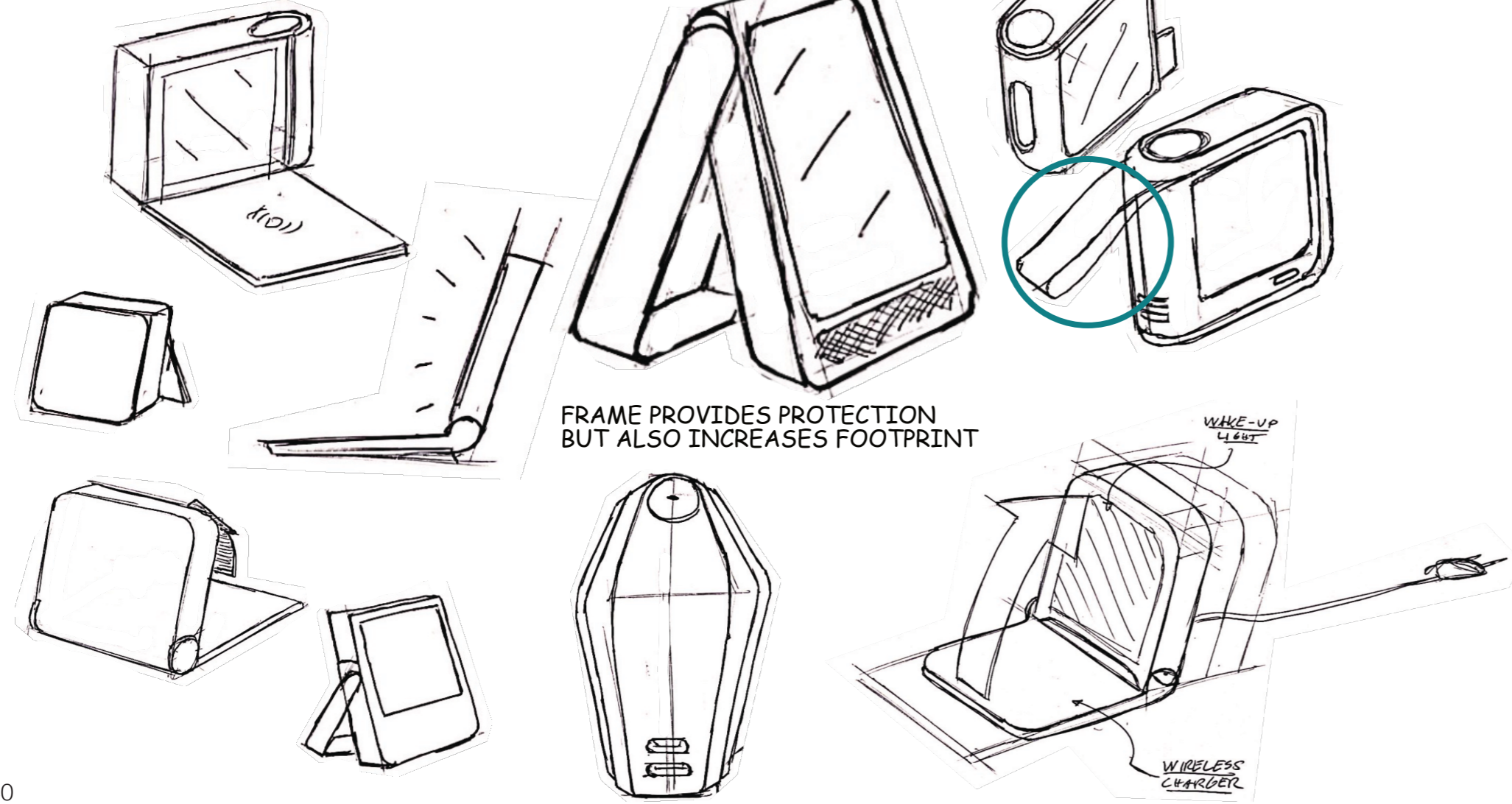
Finally, a small interview was conducted with Interviewee A from the research report. This interviews helped solidify some aspects of the design, such as the small footprint. Interviewee A mentioned some of the smallest night stands he had at accommodations at sizes of 200 x 300mm (depth x width). To put this into perspective, a night stand with an iPhone 12 Pro Max and 250mL glass of water have been sketched out to scale on a nightstand of this size to the right. Not much room is left for other devices showing the necessity of a small footprint on a product like this.

With a small footprint like this, the product can not be too tall, and the weight distribution needs to be perfect as well. Taking the results acquired from the survey and from the interview, the ideation refinement began. This time, the focus was on a rectangular design that could be slotted alongside books and other items in the bag.



One interviewee said the smallest night stand he had experienced in a hotel (200 x 300mm), shown with an iPhone and apple watch to scale.

Design Refinement



Sizing & Proportions



Dimensions:

80 x 80 x 30 (mm)

Notes:

Very small, which is good, but all desired parts may not fit (be realistic). Feels a bit too small for a device like this



Dimensions:

90 x 90 x 35 (mm)

Notes:

Good size, fits in hand, depth has good proportions to width and height



Dimensions:

100 x 100 x 35 (mm)

Notes:

Big, Clunky, doesn't fit in hand well, lots of room, but also questionable if travelers will take it with them

Final Design

The idea of the product is to take the various comfort inducers we have researched and gotten feedback on from the surveys, and implement them into a single product. A phone is a powerful tool in the hands of a business traveler and will accompany them on almost every trip, however, designing an extension of the phone to achieve this task didn't seem feasible. The loudspeaker isn't immersive enough on a phone, and the screen brightness isn't enough to create an artificial sunlight.

From speaking from different business travelers I realized that if a product under-delivers or just doesn't achieve maximum effectiveness it will be left at home. Taking this into consideration, the product I designed isn't just an alarm clock but several different pieces of technology put into one to make a purchase of this device worth it for any business traveler. These are described below:

Sound:

In order to deliver a quality and immersive sound experience a dedicated loudspeaker will be in the device. This is useful for the alarm soundscapes but lets the product double as a conference speaker or a bluetooth speaker while out and about so that only one product needs to be brought on the trip. If we look at the market research and consider feedback from interviewees we notice that there are not many wake up lights that boast expert sound quality, making this a possible pull factor for users to use this product as opposed to other brands.

We also notice from the survey that people wake up to a wide range of sounds. Offering a wake up light with a limited set of sounds has a similar argumentation point to a hotel room, you

can offer some level of variance but in order to provide true comfort you need to be able to provide a wake up experience that is unique to the user. For this reason, the product will offer a customizable soundscape creator where predetermined sounds can be combined with self-recorded sounds. This will allow the user to create a soundscape that is individual to the user alone, providing a true level of comfort.

Scent:

Wake up with scent will be incorporated into the design to add another level of immersion and comfortability. While not directly responsible for wake up, it delivers a feeling of waking up at home like no other. Luckily, a wide variety of essential oils exist from smells of the ocean, fresh cut grass, vanilla, and coffee, which allows you to create a unique wake up environment that is personalized to you. The device will use a heat oil diffuser which releases a burst of scent every few minutes in the final stages of the wake up phase.

Light:

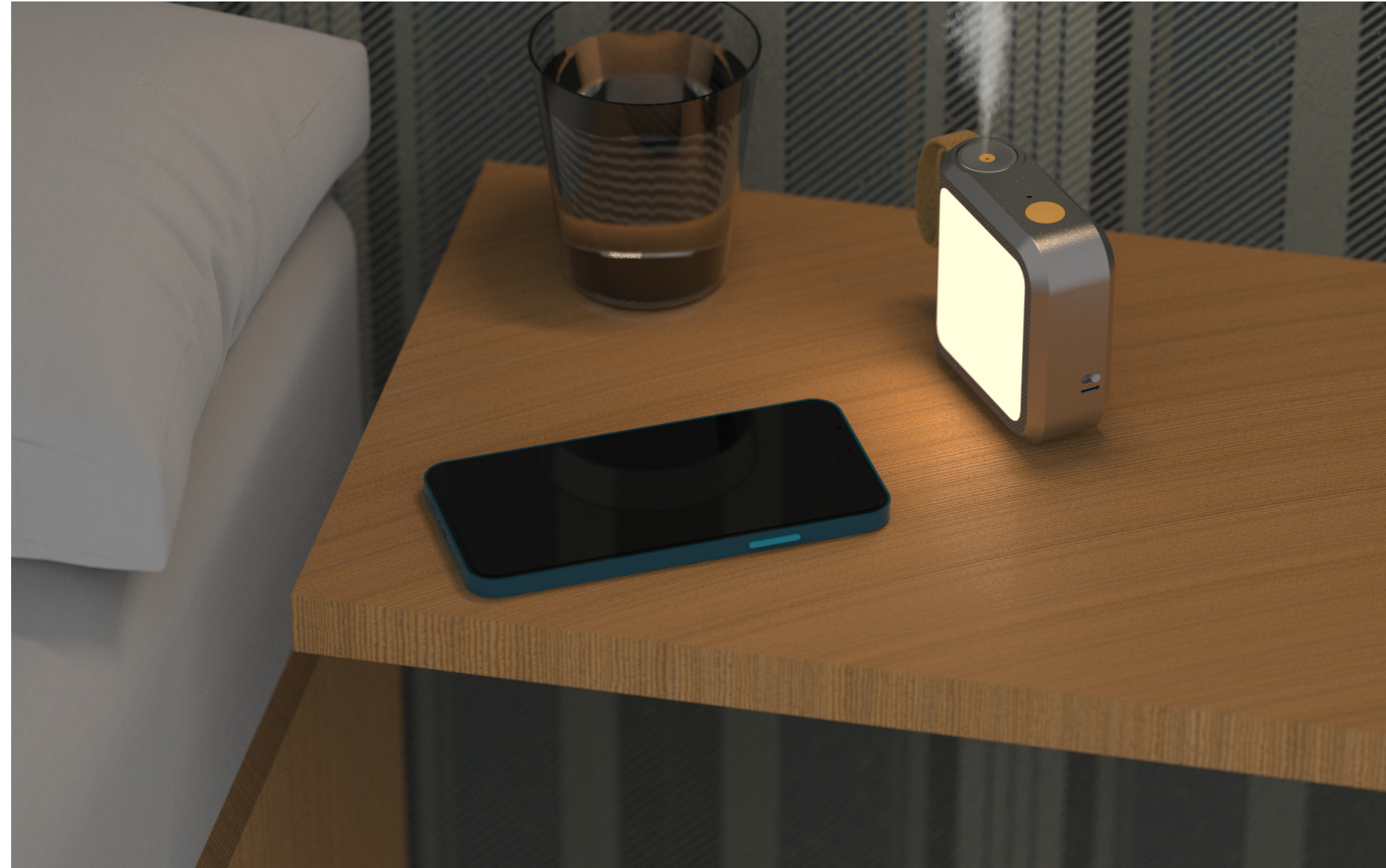
A wake up light will help simulate a sunrise on your trips with LEDs that turn brighter, from off to 200lumen over the course of 30 minutes. LEDs don't use much energy but create heat, which is why the body of the product will be made from aluminum so the heat from the diffuser and the LEDs can dissipate without the need of a fan.

Microphone:

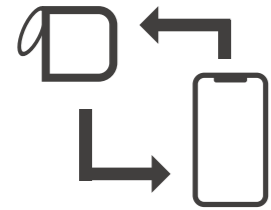
Lastly, the addition of a microphone will allow the user to use the speaker for conferences or phone calls. At little extra cost to include this technology it provides the device with much more use cases that without it.

Good Morning, Alåra





Alåra is an alarm clock for travelers on the job that promotes healthy wake up methods while also allowing you to personalize your alarms to create comfortable environments to wake up in. This is done with various technologies to trigger your senses when you wake up such as personalized sound-scapes, artificial sunrises, and an oil diffuser that can diffuse any essential oil you can purchase. With a simple oil cartridge to refill and a companion app to use.



The product is kept clean and elegant by including only what's necessary in the design. This includes the power button, the microphone mute switch, a removable oil cartridge and a USB-C port. The other functions such as volume can be controlled on your smartphone via bluetooth. A smartphone is a powerful tool in the hands of travelers, providing boarding tickets and other important documents and applications.



The essential oil cartridge is easily removable by simply pressing on the cartridge so it pops out of place. You can put it in your plastic zip-lock bag with your other liquids, and also allows you to quickly replace different scents should you want to wake up to a different smell tomorrow. The cartridges are refillable by any essential oil available and its small size doesn't require a lot of extra room in existing toiletry bags.



Ambience mode allows you to use Alåra without the wake up functionalities in order to create a comfortable workspace. With Alåra's light, sound output and input and oil diffuser you can create a personal environment wherever you are. If you want a bluetooth speaker on your business trips, Alåra can be your 2-in-1. This mode can also be used to fall asleep, since the mode is time based.



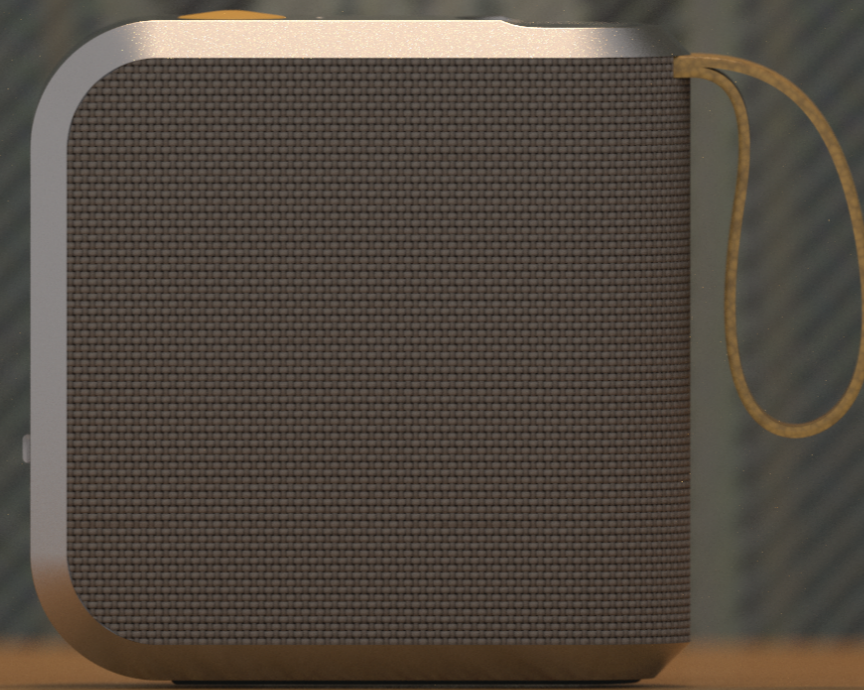
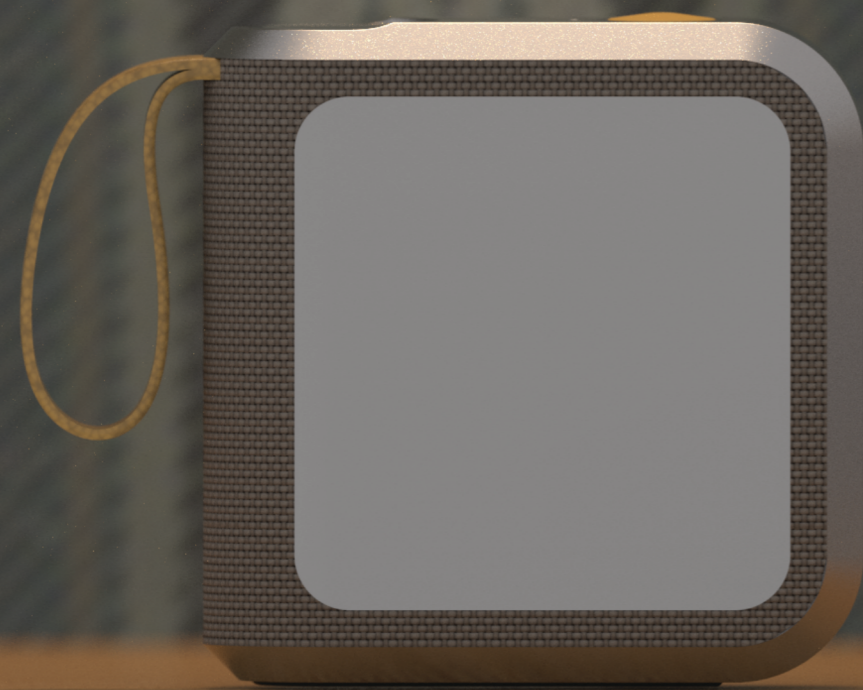
Also comes in Black...

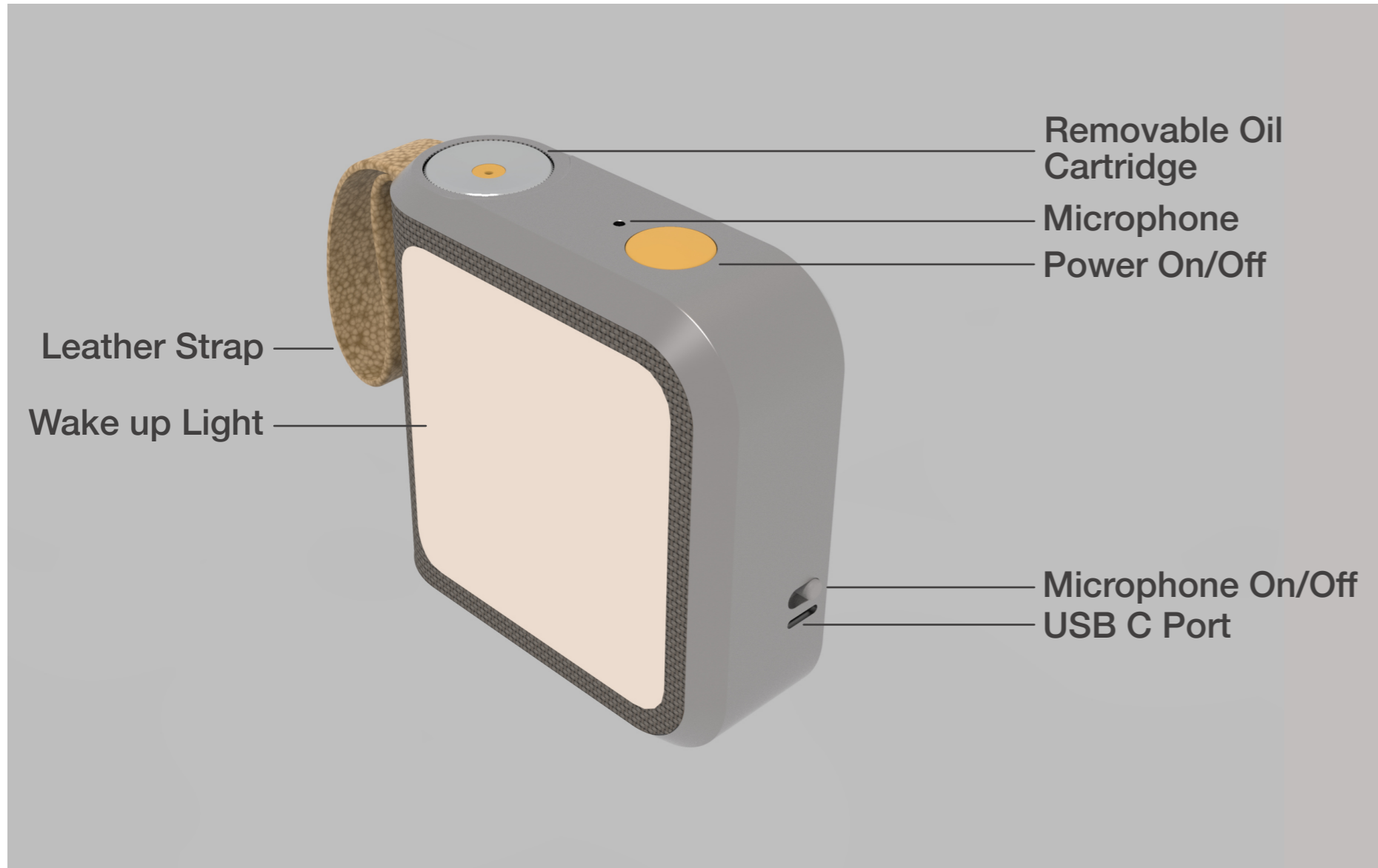
The leather strap allows Alåra to be attached to a bag, while the aluminum frame protects the rest of the design. This frame is important to provide durability during transit in or outside of the bag and to protect the fabric.

The strap consists of mycelium leather which is fungus based. It produces less CO2 than traditional leather and is just as stylish and functional.

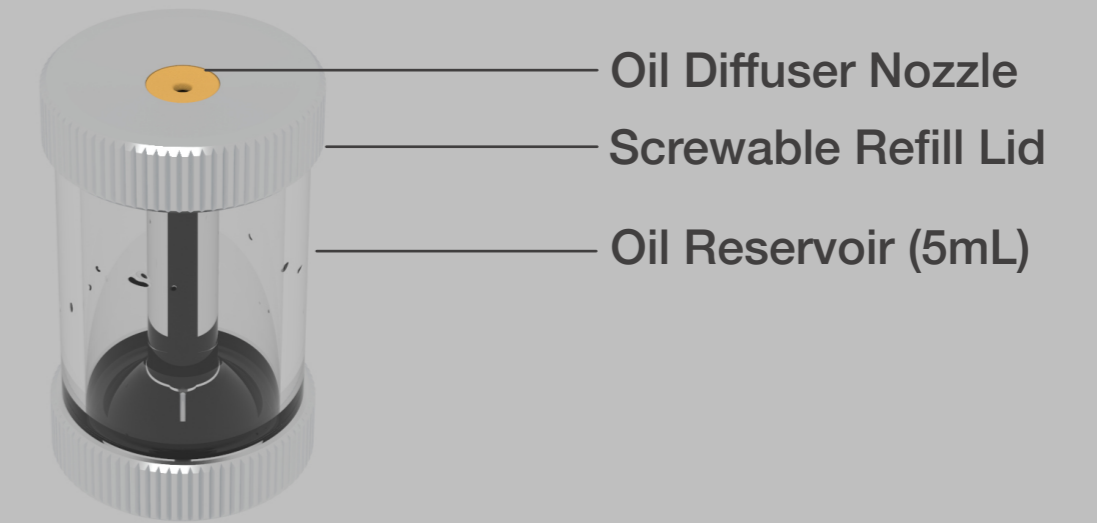
The speaker which is located on the rear of Alåra, (this side) is covered by linen fabric. This allows the speaker grills to be covered and protected while offering an elegant, clean design.

A USB-C port is used to charge the device, while a slider can disable the microphone if there are worries about privacy. Since both shapes are oval, they are on the same side.





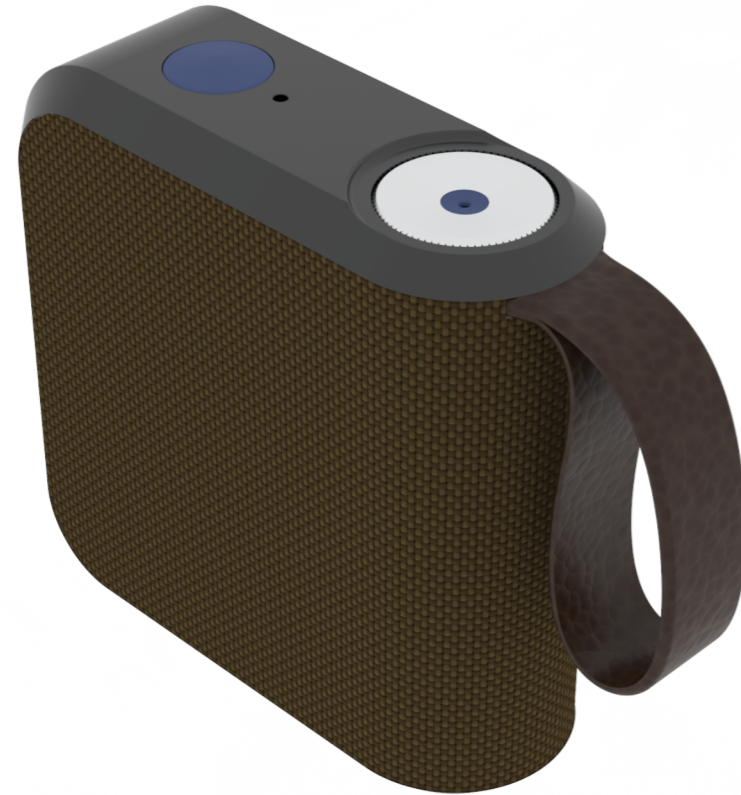
The diffuser cartridge is made of aluminum, glass, and a silicone nozzle. The sides of the aluminum have ridges so that you fingers have a grip for screwing open the cap. The silicone nozzle is sealed enough to expel the liquid when needed, but keeps the liquids inside the cartridge during transit to avoid spills.



- Oil Diffuser Nozzle
- Screwable Refill Lid
- Oil Reservoir (5mL)

To keep the design clean, labels for the individual buttons have been left out. Many devices we use nowadays have as little buttons as possible and we learn their different functions. There are 2 buttons on Alåra and each only serve 1 purpose, making them easy to learn.

The singular piece of linen wrapped around the product like the aluminum gives Alåra a truly seamless aesthetic. Linen is a fabric found in homes around the globe and hasn't been used on speakers so it provides uniqueness and comfort.

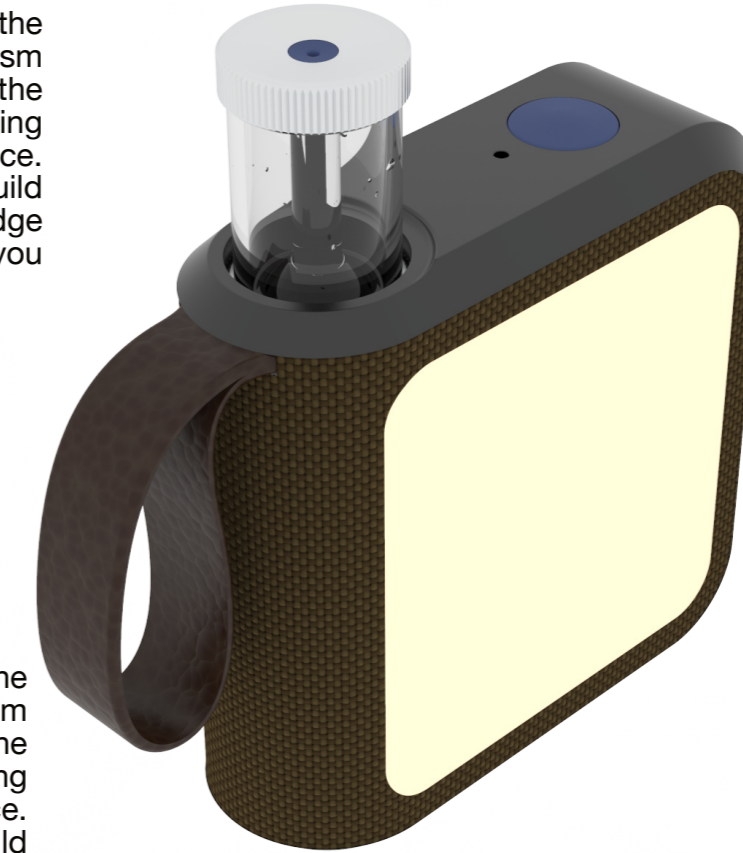


Power button + microphone located on the top to match the circular opening of the oil cartridge. This aesthetic is clean, and separates the oval shapes (side) from the circle shapes (top). Furthermore, the microphone has the broadest area coverage when placed at the top.

A fallback alarm is built into Alåra which will play alarm noises along with your playlist once your wake-up cycle is complete. This is to make sure you don't sleep too far past your desired wake up time

Upon pressing the top of the cartridge, the mechanism unlocks and pushes the cartridge outwards. Pushing it back in will lock it in place. The tight fit and solid build makes sure the cartridge only comes out when you want it to.

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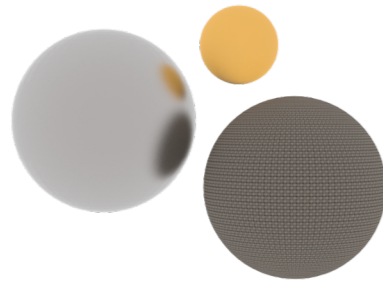


The accented power button and oil ejection nozzle are inspired by the Google Pixel series where unique colors are chosen to highlight specific buttons. It adds a nice contrast and level of fun to the design.

A lot of heat is created from the oil diffuser and the LED lights during use. With a unibody of aluminum, this heat can dissipate throughout the product and out the frame without the need of a built in cooling system.

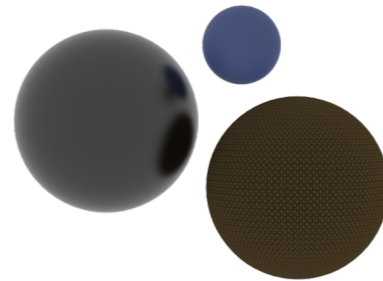
Alåra Light

Alåra Light uses a silver anodized aluminum combined with a taupe linen to create a comfortable light aesthetic. Silver anodized aluminum was chosen to give soft reflections of the surrounding while providing a pleasant surface to the touch. The beige mycelium leather and mustard-yellow accents add freshness and contrast. Linen was selected for its deep origins in nations across the globe and its use in our places of comfort. Anodized aluminum is recyclable and has found its place as a comfortable material to be around in our everyday lives.

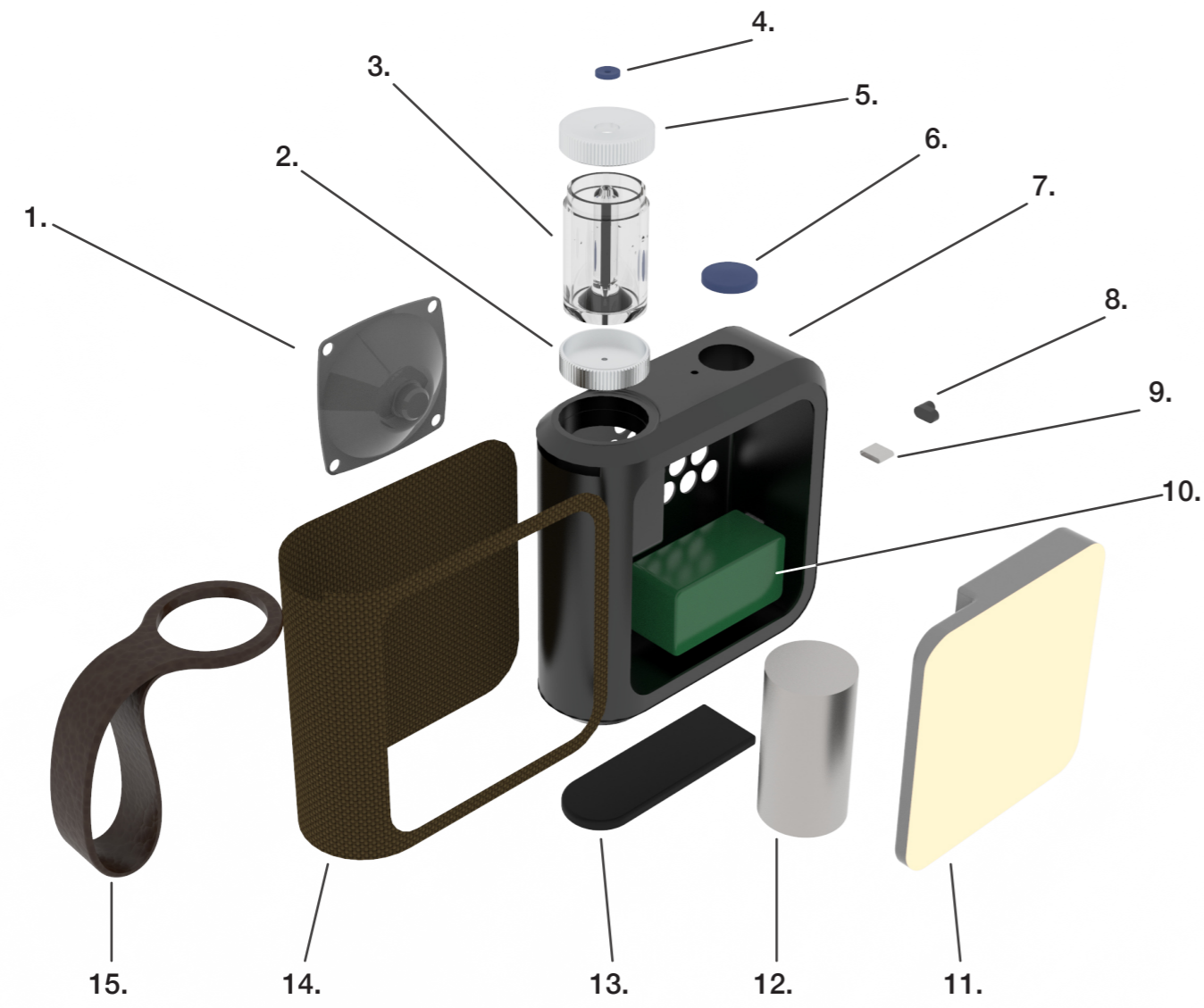


Alåra Black

Alåra Black utilizes darker and richer tones to recreate an industrialist feel. We discovered earlier in the survey that some respondents felt most comfortable in an industrial interior design. Alåra Black uses black anodized aluminum, chocolate colored linen, brown mycelium leather, and a navy blue accent to bring warmth and elegance to this color-way. The black anodized aluminum creates warm colors when reflecting light beams while the linen further endorses warmth and comfort.

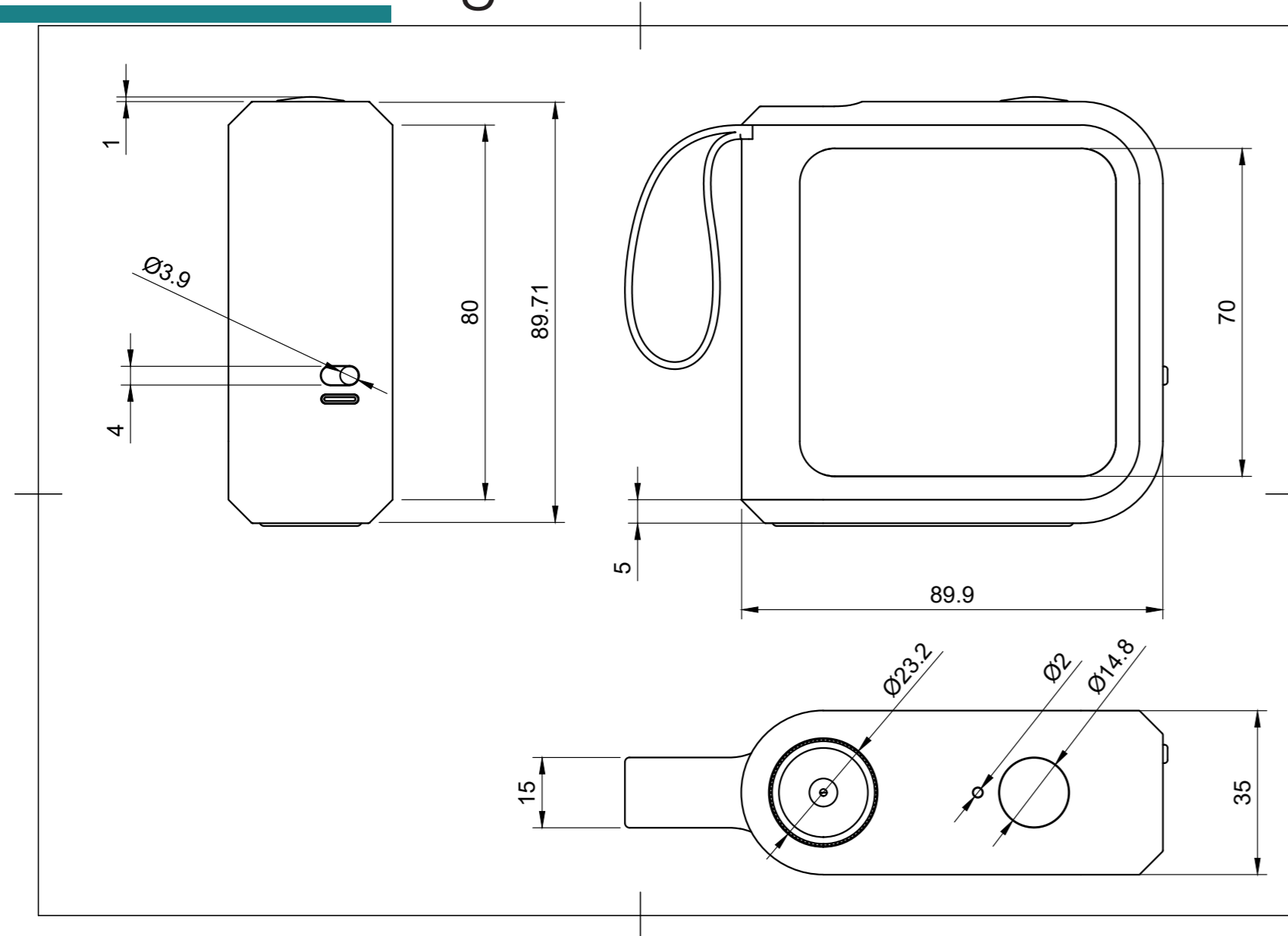


Exploded View



Bill of Materials				
Part No.	Name	Material	Color	Finish
1.	Loudspeaker	---	---	
2.	Oil Cartridge Base	Aluminum	Silver/ Dark Grey	
3.	Oil Cartridge Reservoir	Glass	Clear	Anodized
4.	Oil Eject Nozzle	Silicone	Mustard-yellow/ Navy blue	
5.	Oil Cartridge Lid	Aluminum	Silver/ Dark Grey	
6.	Power Button	Aluminum	Mustard-yellow/ Navy blue	Anodized
7.	Alara Unibody	Aluminum	Silver/ Dark Grey	
8.	Microphone Switch	Aluminum	Silver/ Dark Grey	
9.	USB-C Port	---		
10.	Li-Ion Battery	Light Emitting Diodes		
11.	LED Array	---		
12.	Essential Oil Heater	---		
13.	Non-slip Base	Silicone	Black	Rubbery
14.	Fabric Wrap	Linen	Taupe/ Chocolate Brown	Woven
15.	Strap	Mycelium Leather	Beige/ Dark Brown	Leather-like

Technical Drawings



Design Specifications

Strap

The mycelium leather strap was added to allow an extra method of use and transportation to the users who need it. The placement was chosen so that if hung, the oil diffuser still works since its in an upright position while at the same time, the other 3/4 of the perimeter of Alåra is protected with the use of the aluminum. If the strap isn't used it is still stylish and portrays the utilitarianism of this device despite its elegance.

Aluminum

Aluminum was chosen as a material because of its durability, weight, and aesthetics. While aluminum can be damaged with heavy hits to it, ideally Alåra is kept

within bags where books, clothes and other electronic devices won't dent the aluminum. Scratches can be reduced by providing an optional sleeve for Alåra. This sleeve would have linen on the outside and a felt layer on the inside. The 5mm chamfer used on the aluminum because the aluminum frame was 5mm thick resulting in making the aluminum flush with the linen.

Linen

Linen is a material we often find in comfortable interior environments around the world. The radius around the strap-side of Alåra was selected to make a perfect half-circle to fit the 35mm depth of Alåra

Accents

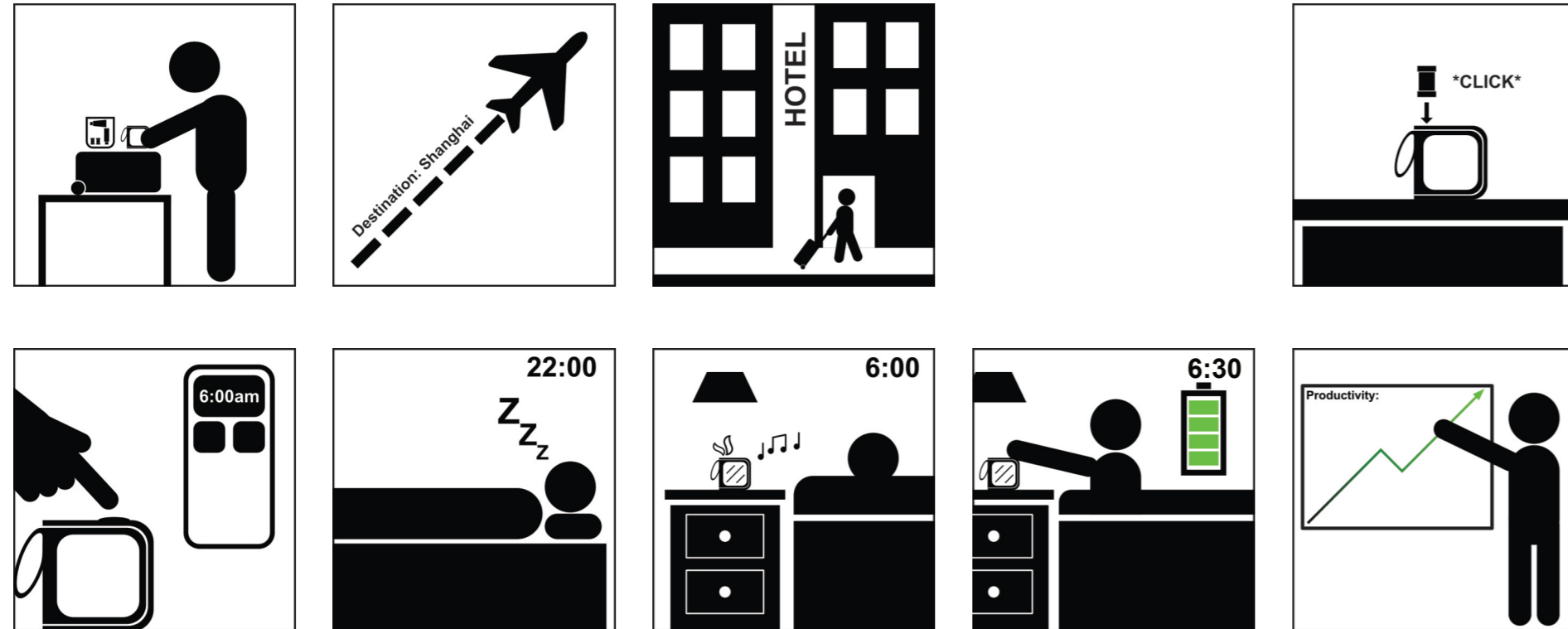
The accents on both Alåra light and Black were chosen to make the design pop. Both designs have a color-way to match the preferred interior designs chosen in the 2nd survey, but lacked uniqueness in the design. Mustard yellow and navy blue on the light and black model respectively firstly puts emphasis on major interaction points on the design, like the power button, but also provides freshness to the color palette

Charging Port

The charging port of Alåra, along with the microphone mute button are right-aligned on the side of the aluminum frame. This position was chosen after

ideating different options. At first, even the power button was supposed to be on this side. The current position was chosen to organize them into a single place, while the right-alignment puts them on the side of the loudspeaker and battery where there is more space for their electronics than by the LED array which stretches all the way to the sides of the device.

Storyboard



Alåra App

The Alåra app was designed to be different, and provide a refreshed look to the alarm clock app experience. This was because of the nature of the product, which provides a new approach to wake-up routines, bringing a piece of your comfort with you wherever you are.

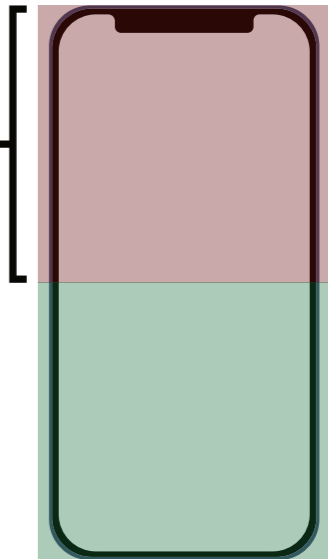
Some of the features of Alåra were easy to design, since they didn't do too much to function the way they should, they simply have on or off settings. For example, the wake-up light would simply start at its lowest brightness and transition to its 200lumen over the course of 30 minutes. The oil diffuser would release a fume of your desired oil every few minutes in the last 10 minutes of the wake-up routine, so these 2 options could simply be governed by a on/off button. The fall back alarm which plays classic alarm sounds, should you oversleep the 30 minute routine, could also be an on/off switch and the friends and family tab could be a drop down menu. Of course the fallback alarm, and oil diffuser would still be influenced by machine learning, but there was one element which needed large consideration from the user interaction side.

The main element of Alåra which influences the soundscape immersion was the customizability of different wake-up sounds. Alåra needed the opportunity to provide the sound customization but deliver it as an experience that was easy to understand, simple in its designs, yet deliver an incredible sound experience. You should be able to wake up at home with the sounds you enjoy every morning, or create a completely unique ocean-side or forest-like soundscape right at your finger tips.

Another important aspect of the app is its usability. Where

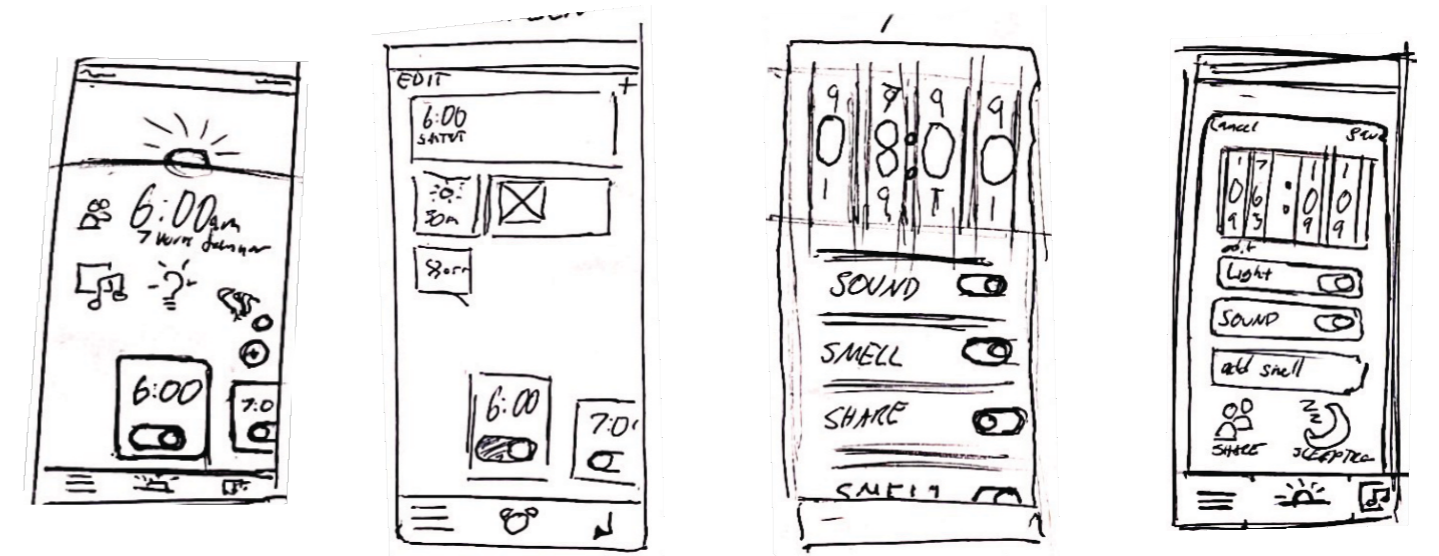
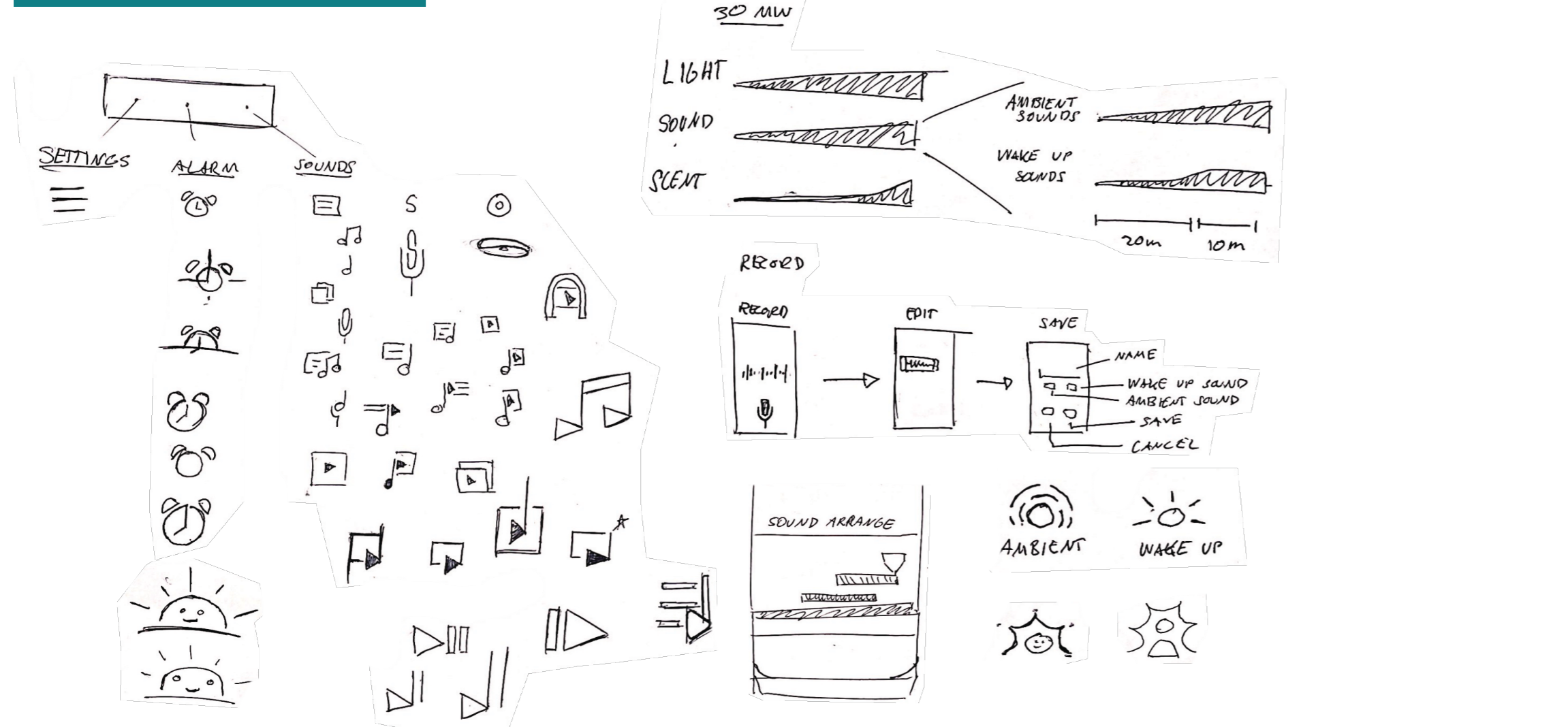
the information is located, and the buttons to interact with it. In order to create an app that is easiest to use, inspiration was taken from both iOS and Android operating systems to create a UI that looks and feels good. The buttons should be easy to press with your fingers without stretching too much, and the app navigation should feel natural. Below, is a blueprint of what the UI could look like.

The upper area of the screen should mostly be reserved for information and only some buttons that you don't use often

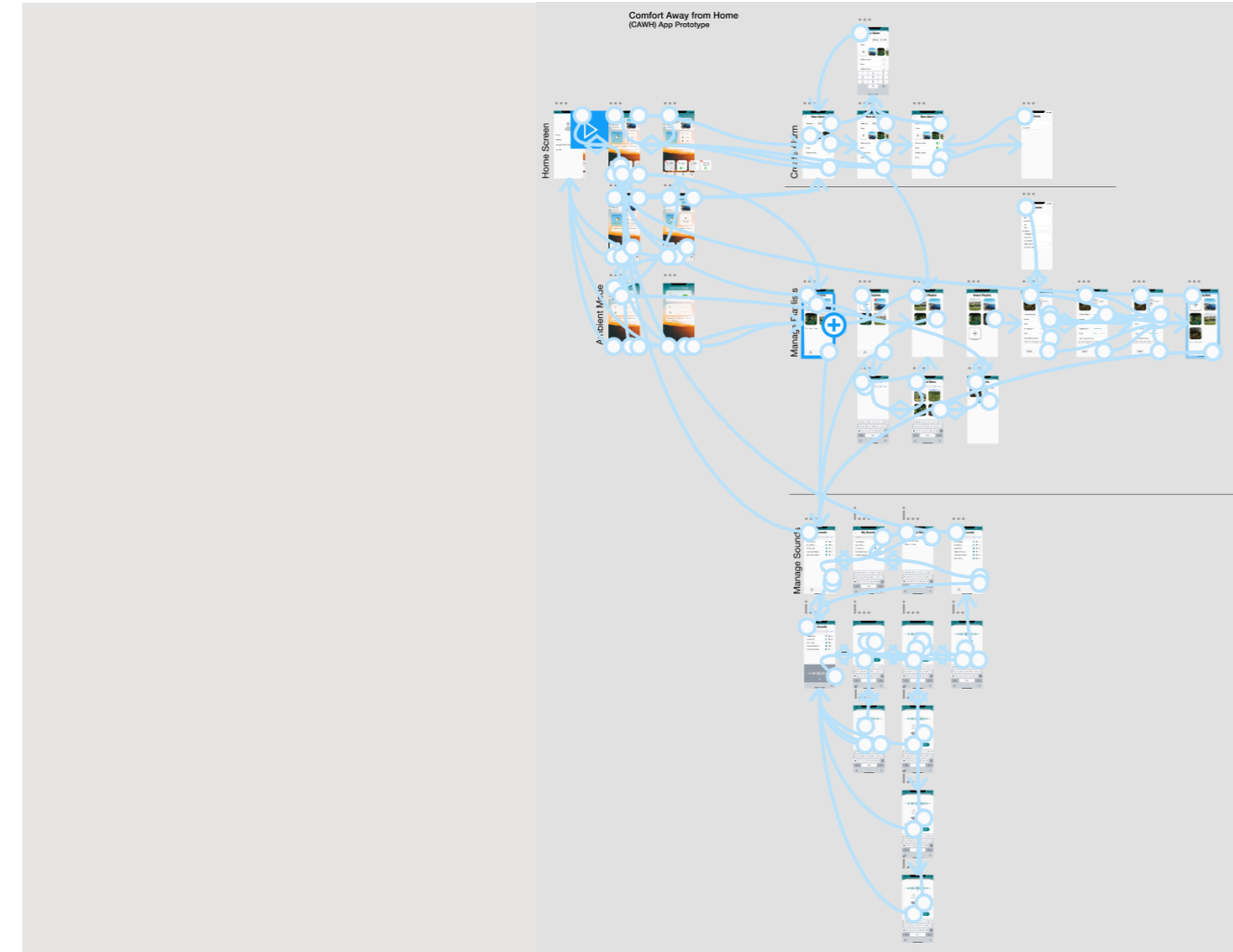


In the lower part of the screen most interact-able buttons should be located so that they are easy to reach with your thumb.

App Ideation

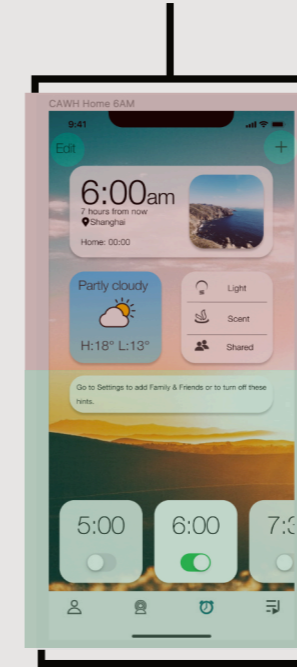


App Prototype



An entire working prototype exists with animations and press-able buttons. Since this is a PDF, we will analyze the slides individually, so let's break it down.

The top portion of the screen mostly includes informative elements with the exception of the "edit" and "add" which won't be used as often as other interactive elements.



The bottom portion of the screen includes most of the interactive elements like the various alarms and the toolbar. These interactive elements will be used a lot during use.

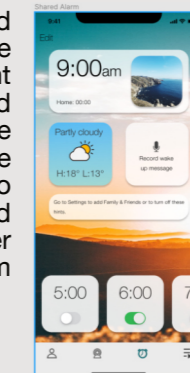
Pressing on the various alarms shows the different information about them



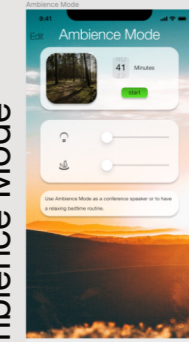
Home Screen

Selecting "edit" allows you to delete alarms while "add" creates new ones.

This alarm is shared with the user. As we can see in the top right slide it is labeled "shared with you". The microphone on the widget allows you to record a personalized voice memo for the user who shared the alarm with you



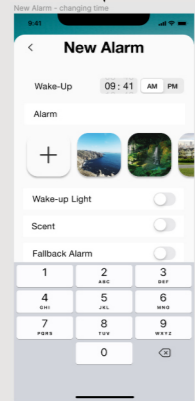
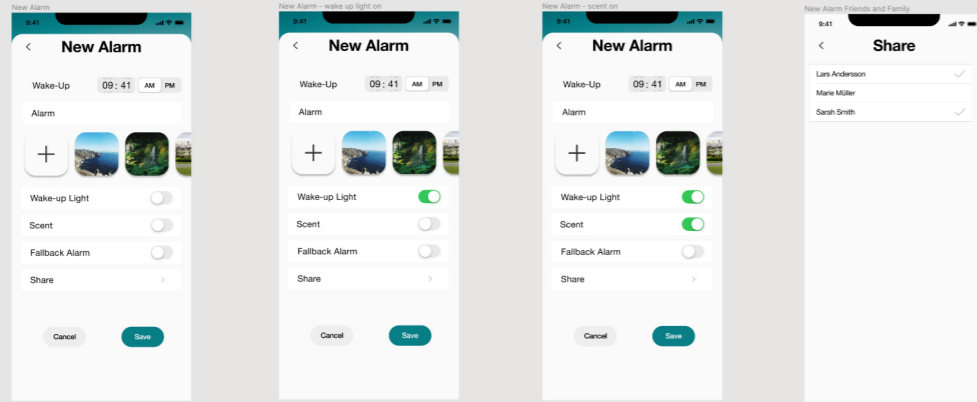
Ambience Mode



Ambience mode allows the user to use the light, sound, and smell to create a private atmosphere whether its in your accommodation or another private area. This can make for a great conference setup, meditation setup, or even going to sleep since the it's controlled with a timer.

Creating a new alarm requires a desired wake-up time, a sound playlist (which is a collection of sounds that will play over the course of the 30 minute wake-up period), and decide if the light, scent, and fallback alarm should be on or off. Lastly, you can share the alarm so friends and family can leave voice memos for a personal wake up message.

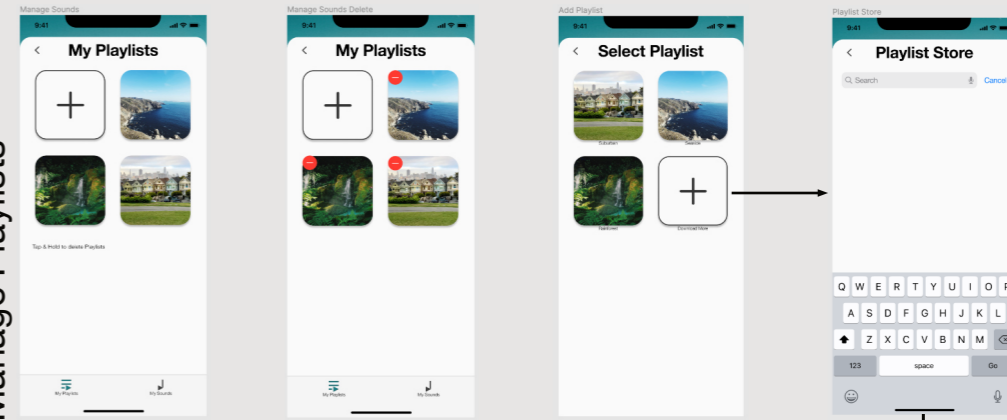
Create New Alarm



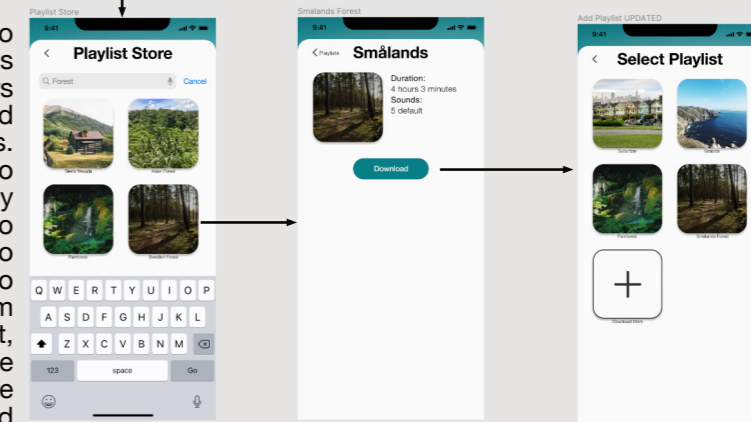
The app could include 1 or 2 demo playlists so that users can use Alåra right out of the box. Further playlists would need to be downloaded as seen later in the document.

Playlists are a collection of personal sounds and Alåra sounds which are combined to create a unique sound experience. A playlist consists of several sound layers to create this soundscape. The first layer is background sound which is downloaded from this menu.

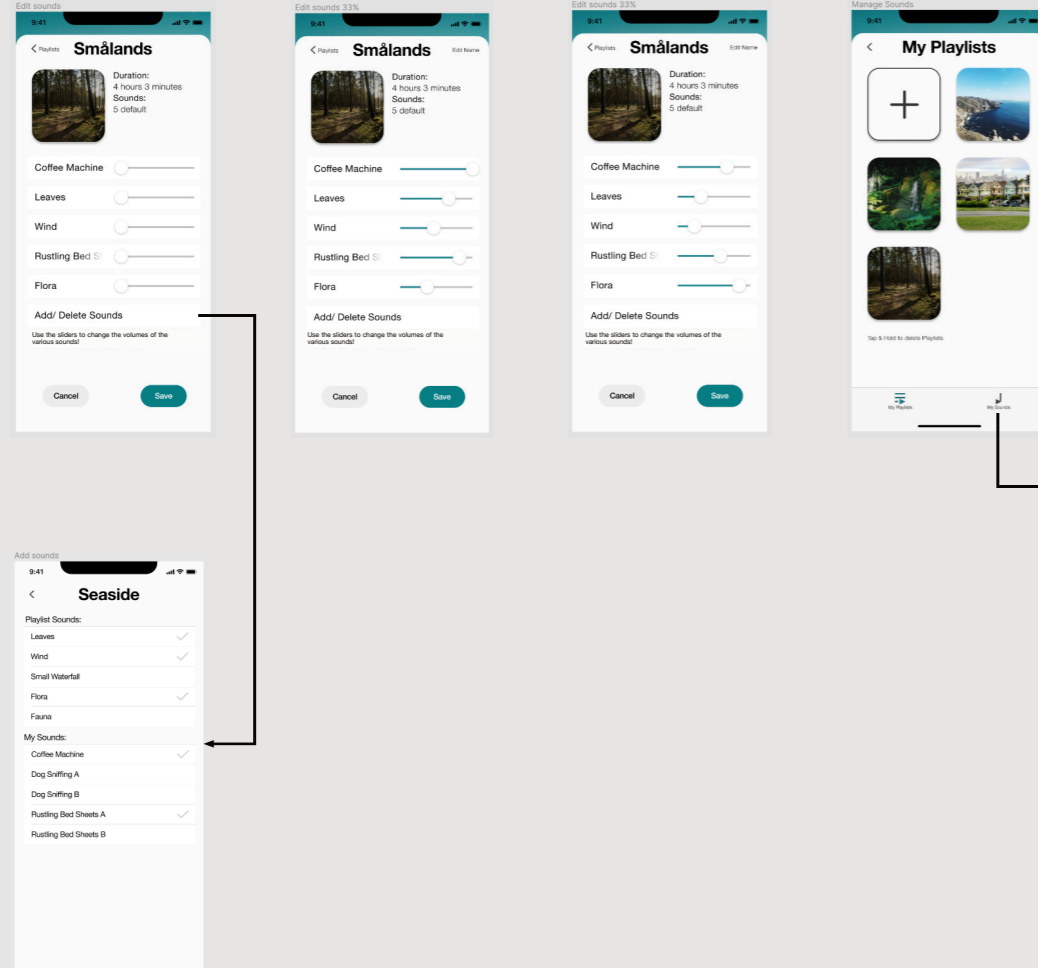
Manage Playlists



As we can see in the 2nd to last slide the "Smålands forest" playlist is 4 hours and 3 minutes long and includes 5 default sounds. They have this length so that Alåra can randomly choose which segment to play during wake up so that you don't get used to hearing the same alarm sounds. This playlist, amongst others can be downloaded and is the basis of any alarm used with Alåra.

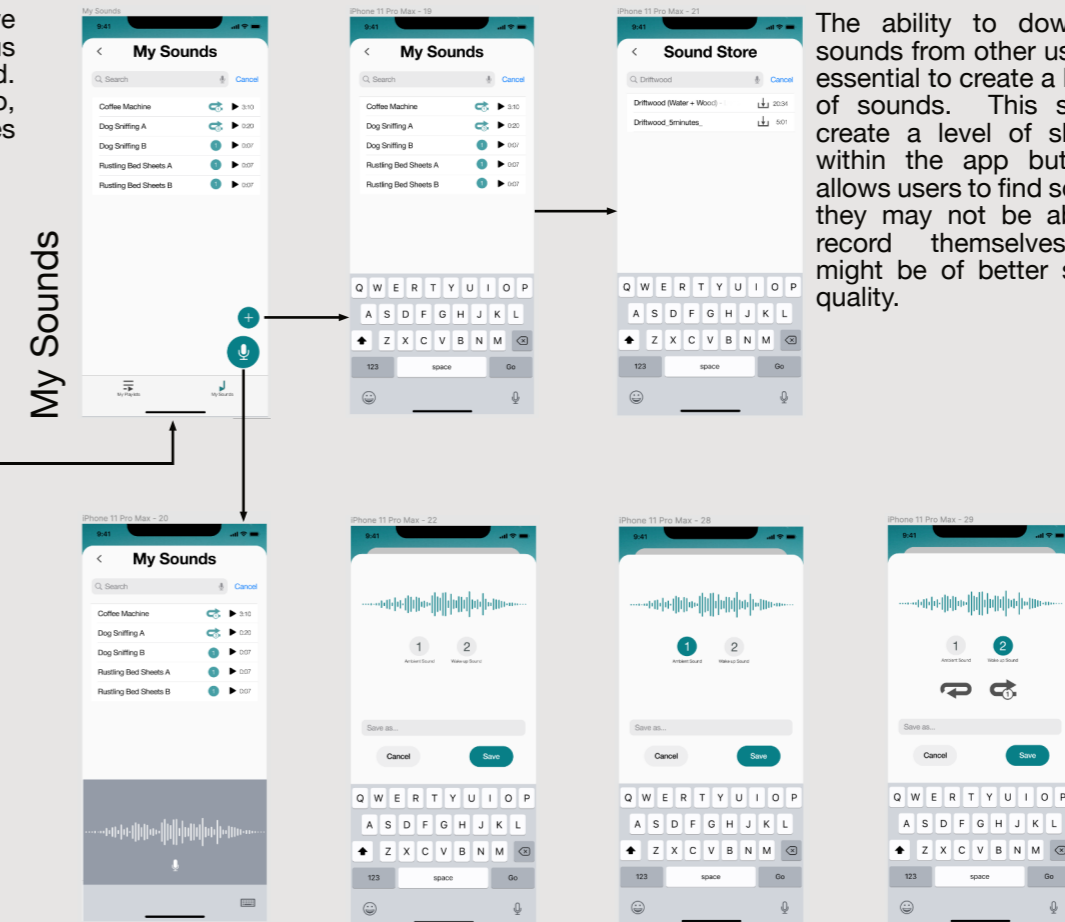


Here we can see how the playlists work. Once selected, several sounds are displayed in the playlists. You can add and delete playlist sounds as you see most comfortable, and also add your own sounds that you have recorded. Furthermore, the volumes of the different sounds can be customized, together, these various features allow you to create a truly unique and personal soundscape to wake up to.



The playlist can be renamed if desired, and is saved under "My Playlists". These playlists are accessible to edit from here, or usable in your alarms when creating a new alarm or choosing the playlist in Ambience Mode.

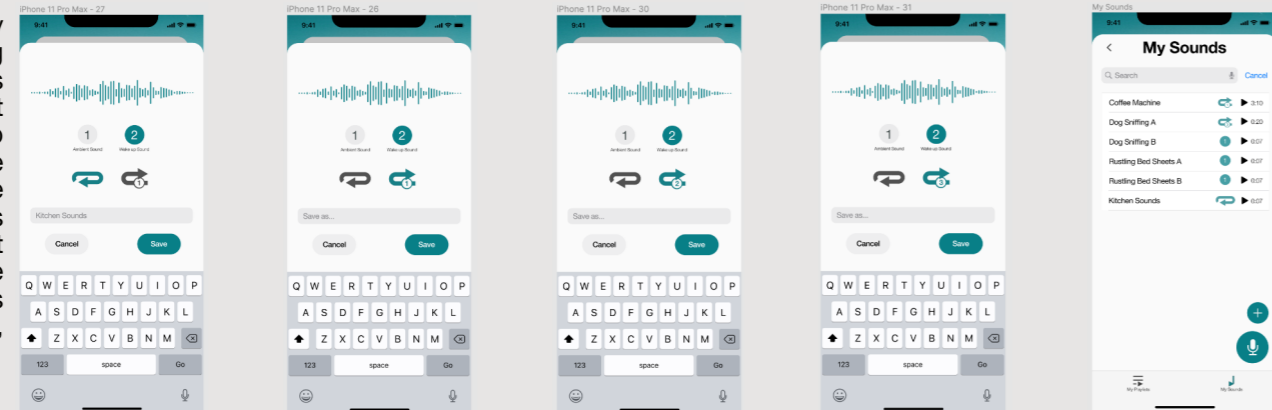
In "My Sounds" you have access to the various sounds you recorded. They can be listened to, and an icon symbolizes what kind of sound it is.



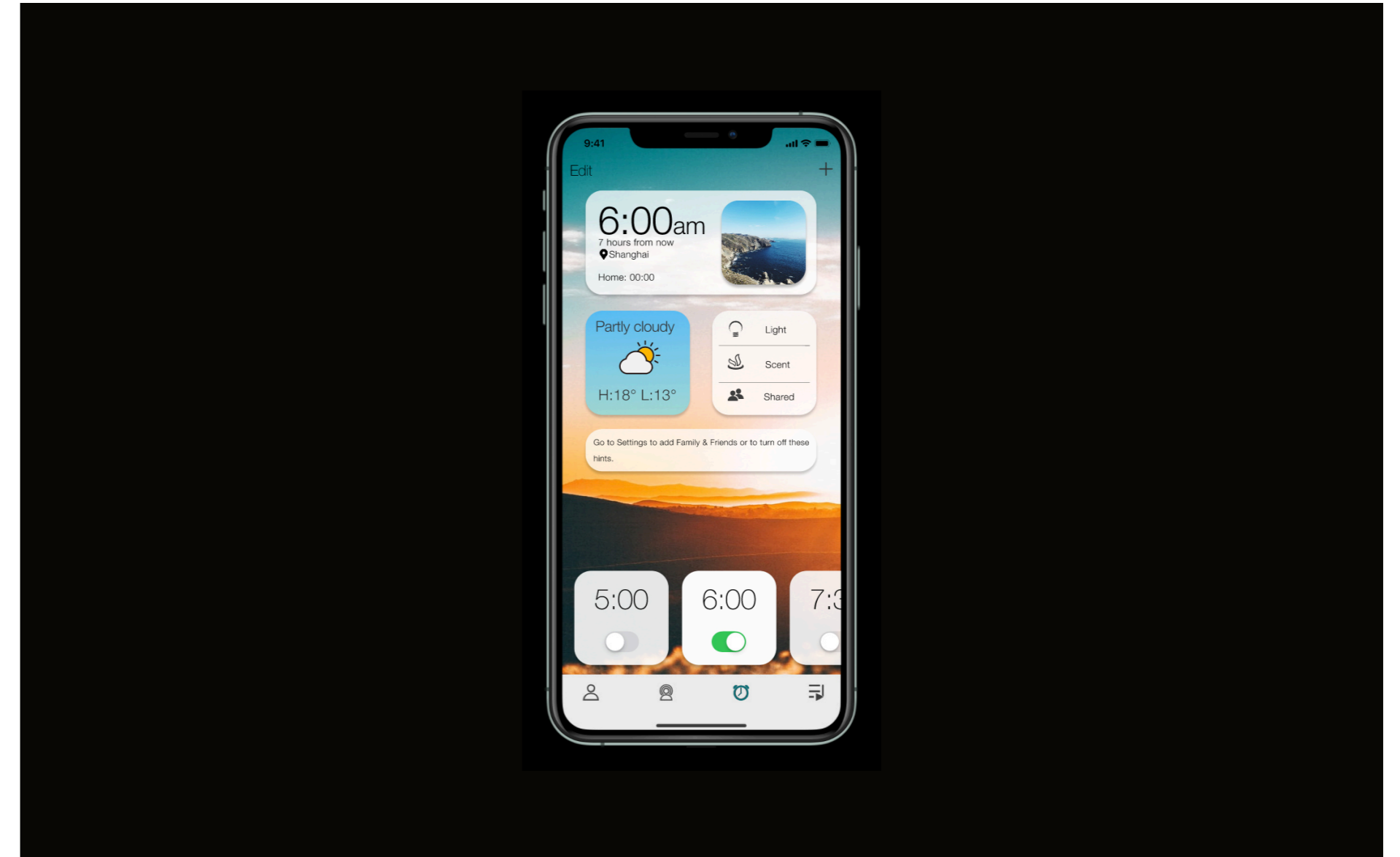
The ability to download sounds from other users is essential to create a library of sounds. This should create a level of sharing within the app but also allows users to find sounds they may not be able to record themselves, or might be of better sound quality.

In Alåra there are 2 types of sounds. Ambient Sound is a sound that can be played during the entire 30 minute wake up cycle. This might be rainfall, or the sound of leaves rustling. Wake up sound on the other hand is played in the last 10-15 minutes of the wake up routine and is a sound you might wake up better to like a coffee machine or the sniffing of your dog.

Ambient sounds only have one save setting while wake up sounds have various different save options. Wake up sounds can either be looped, so they can be played a few times during the routine, but if you want to hear the sound only a few times it can be played once, twice, or three times.



Pressing the back button at the top left side of the screen returns you to the main menu with all your alarms.



Implemented Machine Learning

Alåra will use numerous smart features and machine learning to ensure the wake up experience becomes as personalized as possible, but also better over time. Since reliability is a very big factor in alarms, and we don't want to miss our 8am meeting because our alarm didn't go off, these features could make the experience for every user of Alåra better. These features also give Alåra an edge over the existing market, which has a simple wake up process of brightening the light and playing the same sound playback every morning.



Sound

Depending on when you turn off the alarm during the wake up process, Alåra remembers the sound it was playing around that moment. Since the sounds played during your wake up playlist change a bit every morning, Alåra will be able to learn which sounds help you wake up the most, and can continue to play those sounds closer to your usual wake up times.

Smell

Alåra will also take note of when the last time was that scent was released when you turn off the alarm. This means that over time, Alåra can change the frequency and amount of the scent released if needed to best suit your wake up.

Low-power

If Alåra notices that its battery is low, Alåra will focus on using the wake up methods that have worked best for you in the past. If you tend to wake up more with the sound of your coffee machine, Alåra might turn down the wake up light and scent diffuser to focus on your playlist. If this doesn't work, the fallback alarm will kick in early.

Fallback alarm

The fallback alarm will probe different methods of waking you up after your wake up process is complete. If Alåra notices you turn off your alarm after your wake up process is complete too frequently, it will increase the volume of the fallback alarm to ensure you wake up closer to your desired wake up time.

Further Information

Battery

On iPhone you can see the battery level in your side menu or with a widget. On Android, battery status is shown in the bluetooth menu. While charging, the wake up light should have a “breathing” feeling by dimming on and off to a maximum of 15% peak brightness at 7 times a minute to mimic human breathing. This is to symbolize the connection to people. The battery should last 1 week on a single charge of normal use.

Buttons

The buttons on Alåra don't have any labels on them. This is to allow the design to stay elegant. Fortunately, unlike our smartphones, the buttons

only serve a single purpose. The large button on the top is an On/Off button while the microphone switch on the side can be slid to mute the microphone. Alåra can be reset by holding the power button for 10 seconds. Other features of the device are controlled via the app or with the volume buttons on your phone.

Oil Cartridge

The oil cartridge can be unscrewed to add more essential oil to the reservoir. The silicone nozzle is tight enough to allow liquid to come out during its use with Alåra but keeps the oil inside when its not in use. The nozzle does let the pressure equalize during high altitude so there is no

risk of getting oil everywhere in your liquids bag. If desired, multiple cartridges can be kept in person and used with Alåra if the user wants to use different oils for different wake up routines.

Travel Ease

At the World Wide Developer Conference 2021 (WWDC21), Apple announced that ID cards can be added to the Apple Wallet, starting in the USA. Working together with TSA they hope to make traveling easier by allowing users to go through security checks with their ID on their phones, improving the power of smartphones even more. This reinforces the importance of smartphones for business travelers and

how powerful of a tool they are.

User Feedback



Name: Mario van den Anker
Age: 50
Occupation: Astronomer at European Southern Observatories (ESA)

“I really like the design; it looks very sleek and classy with the brushed metal, rounded corners and the big light.”

“The size is absolutely correct right now, and a one week battery functionality would be fine for most trips. So yes, I would absolutely use this on a trip.”

Alåra Prototype



A 3d printer was used to create the main parts of the prototype while the linen and acrylic were used to properly recreate their materials. LED lights and a battery helped bring the prototype to life. Unfortunately the workshops were closed due to the covid-19 pandemic so some parts of the prototype to make it more realistic could not be achieved. The resources that were available however were enough to portray the size of Alåra and

its general function, such as how the light would look when implemented in the design. We can also see that the brightness from the LEDs is enough to light up the space by the bed, and stronger LEDs could be used too.

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