TABLE OF CONTENTS

01

Market Research on Competitor Products

Product introduction, description, performance, etc.

Leading Sleep Tracking Products
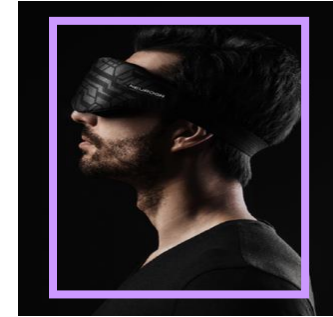

SMARTWATCH

SMARTPHONE

WIRELESS ACTIVITY TRACKER

SLEEP MASK

SMARTWATCH
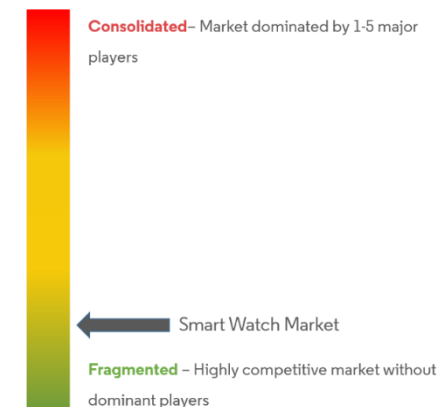Market Research on Sleep Tracking Devices

Examples of most well-known sleep tracking watches: 'Apple Watch', 'FitBit', 'Galaxy Watch', 'Garmin'

Major Players

1. Apple Inc.

2. Fitbit Inc.

3. Samsung

4. Garmin

5. Fossil Group

* Complete list of players covered available in the table of contents below

Market Concentration

Consolidated – Market dominated by 1-5 major players

← Smart Watch Market

Fragmented – Highly competitive market without dominant players

Source: Mordor Intelligence

Smartwatch:

Available Functionalities

|	
AI voice commands	Get Directions
Clock	Look through Photos
Answer Calls	Send Messages
Record a Voice Memo	Stopwatch
Calculator	Translator
Compass	Order Foods
Flashlight	Check News
Waterproof	Credit Card
Track user's fitness	Listen to Music
Track user's health	

Smartwatch Features

Sleep Tracking : Records the duration of sleep

Alarm : sets a silent alarm with quiet vibration

Sleep Stages: Tracks light, deep and REM sleep to understand sleep quality

Sleep Schedule: Sends reminders to stay on track for a consistent routine

Sleep Insights: Get information and data about your sleeps
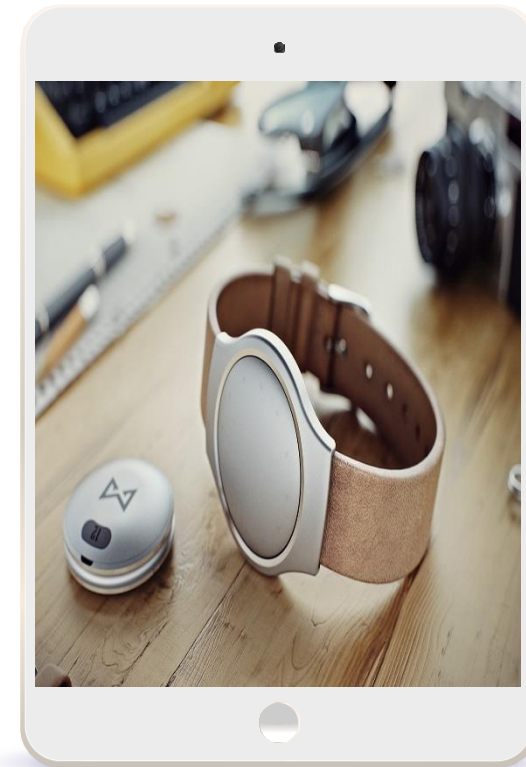
Smartwatch Cons

Battery Life / Need to Recharge

Occasional slow syncing

Need to wear a physical device in bed

Pricey

Small display area

Unless your smartwatch has the cellular capability or can connect to a Wi-Fi network, you have to be within the Bluetooth range of your smartphone to use apps

Smartwatch Pros

Small and wearable that users can carry around easily

Built in AI such as 'Alexa' and 'Siri' which allows users to give voice commands

Great number of other supported functionalities

Accurate measurements
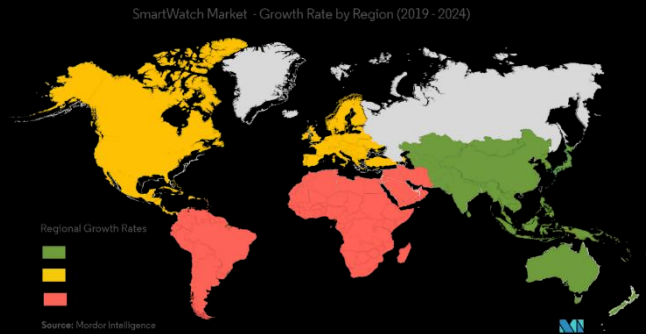
Provides demographics
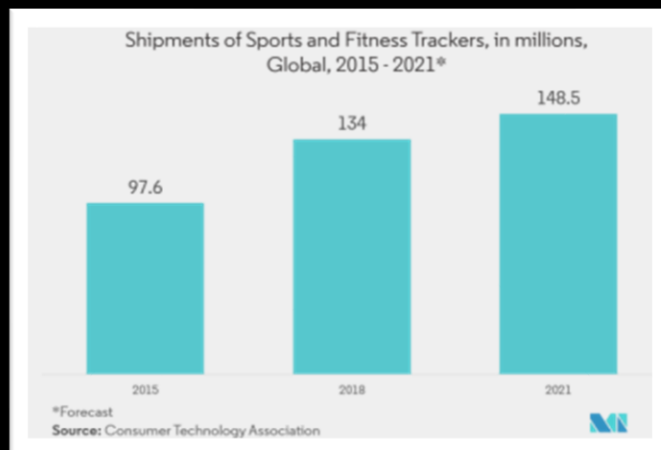
Water-resistance

Fashionable

6

Smartwatch

Market Analysis

SmartWatch Market - Growth Rate by Region (2019 - 2024)

Regional Growth Rates

Source: Mordor Intelligence

In America, nearly 75% of men and 60% of women are obese or overweight. This increases the usage of smartwatches.

Shipments of Sports and Fitness Trackers, in millions, Global, 2015 - 2021*

97.6

134

148.5

2015

2018

2021

*Forecast
Source: Consumer Technology Association

- According to the study conducted in 2018, smartwatch market is forecasted to increase by 14.5% by 2024.

- Current largest market is North America but the fastest growing market is Asia Pacific

- 2018 shipments volume: 43.87 million

- Estimated 2024 shipments volume: 108.91 million

- Operates as a standalone device but also with other devices such as smartphones

- Factors driving the market include:

- Increase in health awareness

- Increase in popularity of wireless devices

- Factors restraining the market include:

- Complexity of the device

- Unawareness about its utility

- In America, nearly 75% of men and 60% of women are obese or overweight. This increases the usage of smartwatches.i
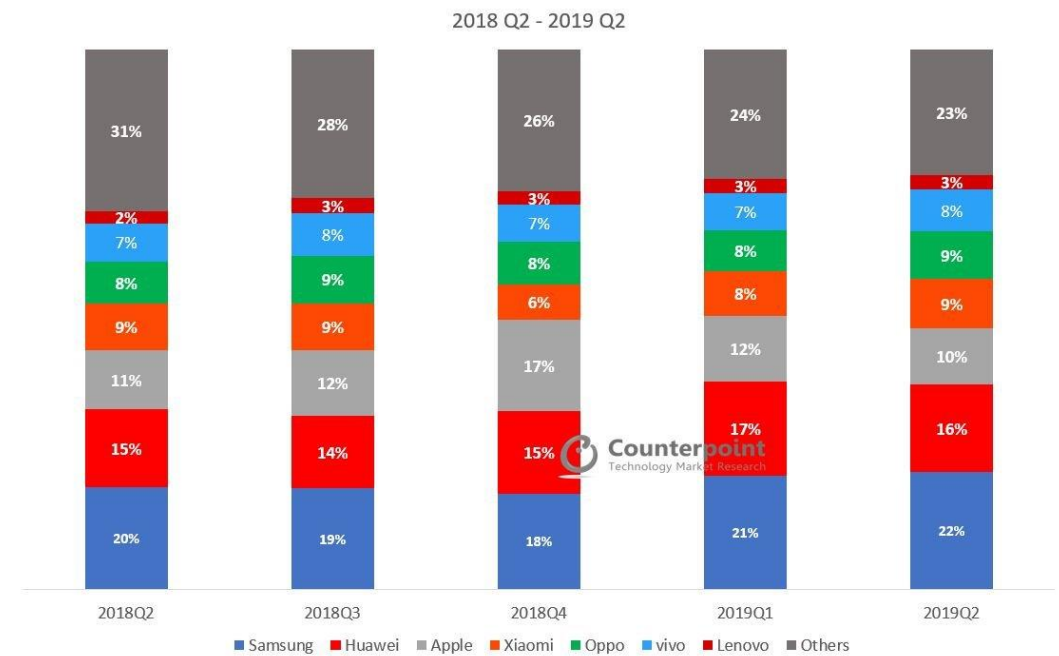
Smartwatch Market Future Insight

Smartwatch can assist doctors by providing significant data obtained with the watches. Doctors can easily track their patients and monitor them.Can detect seizures and alert guardians Fitbit is working to gain clinical validation and regulatory approval for use in detecting health conditions

SMARTPHONE
Market Research on Sleep Tracking Devices

Key players leading the Smartphone market: Apple 、 Samsung、 Huawei

2018 Q2 - 2019 Q2

	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2
Others	31%	28%	26%	24%	23%
Lenovo	2%	3%	3%	3%	3%
vivo	7%	8%	7%	7%	8%
Oppo	8%	9%	8%	8%	9%
Xiaomi	9%	9%	6%	8%	9%
Apple	11%	12%	17%	12%	10%
Huawei	15%	14%	15%	17%	16%
Samsung	20%	19%	18%	21%	22%

■ Samsung ■ Huawei ■ Apple ■ Xiaomi ■ Oppo ■ vivo ■ Lenovo ■ Others

Counterpoint
Technology Market Research

Smartphone:

Available Functionalities

AI voice commands

Alarm

Make and Answer Phone Calls

Record a Voice Memo

Calculator

Surf internet browsers

Take photos and record videos

Flashlight

Play games

Watch movies

NFC

Send and Read Messages

Translator

Order Foods

Download files

GPS

Credit Card

Listen to Music

Smartphone Features

Sleep Tracking : Records the duration of sleep & Records snoring/sleep-talks

Motion detection: Use of microphone or accelerometer to record movements

Sleep Notes: Track different activities (i.e., drinking coffee, working out) to see how it affect the user's sleep quality

Heart Rate: Records heart rate

Alarm : wakes user up at the perfect time

Overview: Total time in bed, average time in bed, shortest night, etc.

Online Backup: Backs up data so that a user can recover lost data

Sleep Aid: Emits a soothing white noise to help users fall asleep

Wake up mood: Prompted upon awakening to record morning condition

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Smartphone Cons

Pricey

Overuse of smartphones lead to decreased real-life social interactions

Distracting (i.e., messages, updates, etc.)

May cause health issues (i.e., bad eyesight)

Addictive

Increase in traffic accidents (i.e., using phones while driving)

Battery Drain

Accelerometer may pick up any movements including those of pets

Smartphone Pros

Portability

Easy Access to Internet and information

Instant Communication with friends and families

Rescue for Emergencies

Capturing important moments with camera

Wide range of apps used for entertainment, education, health tracking, etc

GPS and finding ways

Smartphone Market

According to GSMA Intelligence, 80% of global mobile connections will be smartphones by 2025

Top three countries with the highest number of smartphone connections are China, India and US.

2019 smartphone sales are forecasted to be nearly 1.4 billion units Gartner foreshadows global smartphone sales to decline by 2.5% in 2019 due to lack of replacement demands.

5G Smartphone launching hope to stop the declining sales. 18 countries are expected to have launched 5G networks by the end of 2019.

Continuous focus in AI development to aid user experience

WIRELESS ACTIVITY TRACKER

Market Research on Sleep Tracking Devices

One powerful, insightful tracker.

1

All-Day Activity

Track steps,floors climbed,distance,calories burned & actvice minutes.

2

Clock+Display

See daily stats＆time of day on the OLED display

3

Sleep+Alarms

Monitor how long and how well you sleep＆wake with a silent alarm

4

Wireless Syncing

Daily activity stats will automatically sync to your phone, tablet or computer

Features

SEE PROGRESS

View your progress and analyze your trends with easy-to-read charts and graphs

SHARE+CMPETE

Invite friend and family to share stats, send cheers＆compete on the leaderboard

LOG FOOD

Log food fast with a calorie estimator,meal shortcuts＆expanded food database

RECORD WORKOUTS

Log workouts, see a monthly exercise calendar & use .MobileRun to track run stats and map routes

EARN BADGES

Get goal progress notifications & celebrate fitness milestones with badges

SLEEP BETTER

Set sleep goals,review sleep quality ＆see weekly sleep trend graphs

Wireless Activity Tracker Pros

Has an altimeter to measure stair climbing
Has a display with 6 tracking modes
Features a clock on its display
Accuracy and durability rated high by users
Measures sleep quality
Vibrating silent alarm will not cause disturbance
Ability to connect to online community is highly motivating
Can set either miles or kilometers for distance units
Easy to set up and program
Wireless syncing of latest stats
Compatible with PCs and Macs, iOS and Android devices
Compatible with many other fitness apps available
Ability to connect with online fitness communities
Small, light and discreet
Great motivational tool to become more active and healthy

Wireless Activity Tracker Cons

No GPS tracking
Sleep wristband comes undone and tracker often slips out
Silicone case with clip tends to loosen over time and tracker falls out
Sometimes counts steps while driving on bumpy roads
Display hard to read in bright sunlight
Need to manually enter activities not tracked
Not waterproof

SLEEP MASK
Market Research on Sleep Tracking Devices

Sleep Mask lets you monitor your brain activity whilst asleep.

Neuroon was originally a product focussed on aiding polyphasic sleep (breaking your sleep up into a series of timed naps) but after consulting with the medical and business community, the founders decided to pivot their idea to benefit a wider audience, transforming their device into a 'universal sleep companion' and 'personal energy manager'.

Features

Sleep issues (insomnia, fatigue, trouble falling asleep)

Jet lag

Shift working/irregular schedules

'Smart' napping

Lucid dreaming (available as an additional add-on)

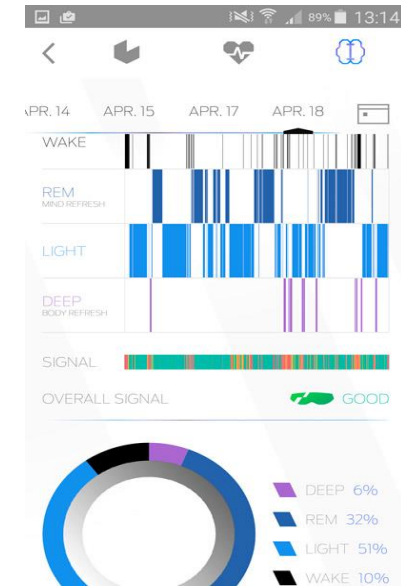**Features of an App Compatible with Sleep Mask**
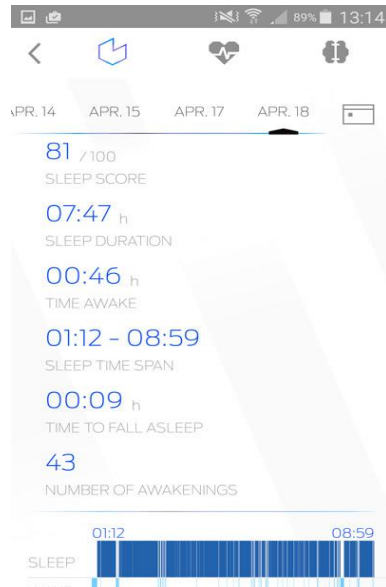
Sleep duration

Sleep score
Sleep duration
Time awake
Sleep time span (start/end of your sleep)
Time to fall asleep
Number of awakenings
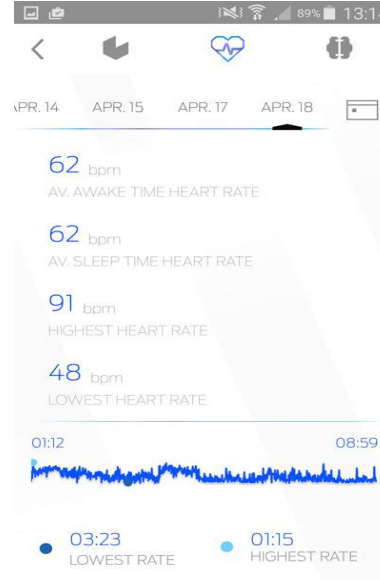
Heart rate

Average awake time heart rate
Average sleep time heart rate
Highest heart rate
Lowest heart rate
Time of lowest/highest heart rate

Rem/Sleep staging

Wake
REM
Light
Deep

SLEEP MASK PRO

Unique EEG (brainwave) sensing technology

Measures REM sleep

Sensors and algorithms measure a wide range of bio-signals

Can help with jet-lag, shift-work and lucid dreaming

Compact and light – good for travelling API coming in the future

SLEEP MASK CONS

Technology is let down by sub-optimal product design

No 'smart' alarm feature to wake you in light sleep

No data sharing or IoT integration at present

Battery life is disappointing

02

Application

Advantages and disadvantages of the application, functional analysis

Overall Market Analysis

Of Sleep Tracking Devices

Global Smart Sleep Tracking Device Market Share
by Geography (%), 2016 & 2024

13.2%   xx%

2016

xx%

- North America
- Latin America
- Europe
- Asia Pacific
- Middle East and Africa

2024

SOURCE: RESEARCH NESTER
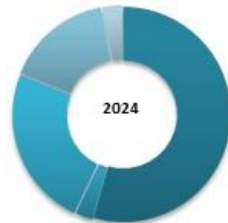
The smart sleep tracking device market in 2016 was $1.1125 billion and is expected to grow at a compound annual growth rate of 18.5% during the forecast period. People are increasingly aware of the need to check and adjust their sleep patterns. More and more sleep-related health problems such as obesity and leg restlessness syndrome have prompted consumers to adopt sleep tracking devices.

The global smart sleep tracking device market is divided into wearable and non-wearable devices by product type. The wearable device segment (74.1% share in 2016) dominates the world's largest smart sleep tracking device market. According to geographic regions, the global smart sleep tracking device market is divided into five main regions, including North America, Europe, Asia Pacific, Latin America, and the Middle East and Africa.

SLEEP CYCLE

SLEEP TIME

SLEEP AS ANDROID

小睡眠

WONIU SLEEP

潮汐

SLEEP CYCLE

| ANDROID	iOS
•4.5 / 5 ★ (96k reviews) •5+ Million Downloads •In-app Purchases	•4.6 / 5 ★ (28k reviews) •Editors' Choice •#21 in Health & Fitness category •In-app Purchases

SLEEP TIME

ANDROID	iOS
•3.8 / 5 ★ (31k reviews) •1+ Million Downloads •In-app Purchases	•4.7 / 5 ★ (4k reviews) •Editors' Choice •#21 in Health & Fitness category •In-app Purchases

SLEEP AS ANDROID

ANDROID	iOS
•4.6 / 5 ★ (299k reviews) •10+ Million Downloads •In-app Purchases	•Not Available
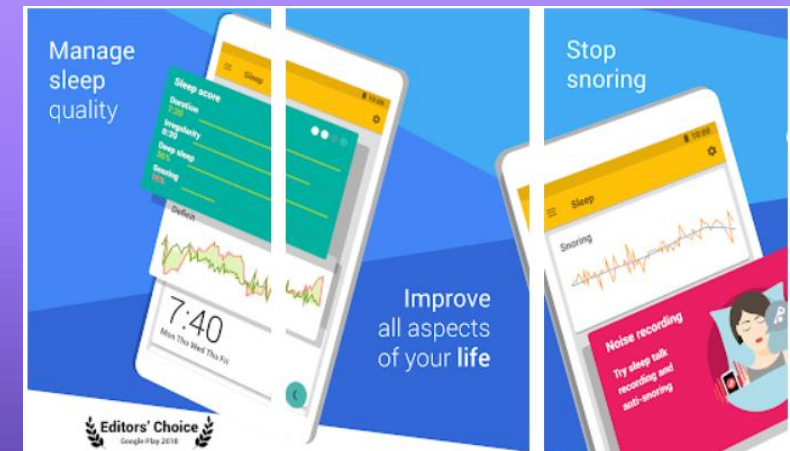
Notable Features

SLEEP CYCLE

Alarm Clock: Uses sound to analyze movements and sleep states. Will monitor signals from user's body to wake them up softly at the lightest sleep stage within the customizable 90 min wake-up phase. Can wake up with the song of user's choice

Motion Detection: Microphone: Uses sound to detect movements as the user sleeps

Accelerometer: Records movements on bed as the user sleeps Statistics: Sleep quality shown as easy-to-read percentage and graphs

Sleep Notes: Records what the user did before going to bed to keep track of habits that result in high or low quality of sleep

SLEEP TIME

Monthly/Weekly Graphs: Visually tracks sleep data

Soundscapes / White Noise: Fall asleep listening to noises that help users fall asleep

Alarm: Link to user's iTunes or wake up with 20 built-in app alarm

Compatibility: Compatible with Apple Health

Statistics: Full history of stats

Pulse Recording: Detects user's pulse immediately after waking up

Tags: Before going to sleep, user is prompted to tag the night with tages such as 'not in your own bed', 'ate late', 'alcohol', etc.

SLEEP AS ANDROID

Sleep cycle tracking: Uses phone or wearable's sensors

Sonar: Contact-less ultrasonic sleep tracking (no need for phone in bed)

Sleep Score: Analysis of sleep quality based on duration, deep sleep %, snoring, etc.

Compatibility: Compatible with wearable tracking such as Pebble, Wear OS, Galaxy Gear, Garmin, Mi Band

Alarms: Gentle nature sound alarms (i.e., birds, sea, storm, etc.) and playlists

Lullabies: Nature sound lullabies (i.e., whales, storm, sea, etc.)

Recording: Records sleep talks, detects snoring and also have an anti-snoring feature

Jet lag Prevention: aids users with overcoming jet lag

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小睡眠

Target Customers:

1. People who have sleep problems and want to improve their sleep quality

2. People who value health including who may not have a sleep problem

Product Features:

1. Professional sleep aid, good night radio, help users fall asleep, improve sleep quality

2. Sleep encyclopedia, psychological test to help users understand more health information

3. Alarm clock, habit training, heart rate test, help users manage health

Pros:

1. High quality and rich sound resources: professional type sleep audio

2. Beautiful visual design: soft color, low saturation and sleep scene

3. Social mode, users can share audio + a short paragraph of text in the sound community

4. The quality of the radio content is high.

24
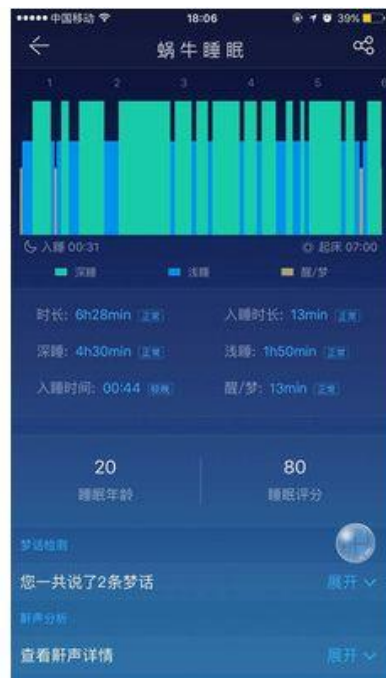
Features

Can monitor recording dreams

Sleep analysis

Deep period

Number of hits

Turn over

Sleep age

Pros

A) functionality:

1. The audio is very rich and professional. The sleep aid interface is divided into four tabs, and each tab has a more detailed category to meet the user's multiple sound requirements.

-- Natural tone tab, can have multiple audio overlays, the interaction is lit, the experience is very good, and the top right corner uses the background to highlight the volume adjustment and timing functions.

--- Story tab, the quality of the story is high

2. The sleep words in the sleep report, the unfolding function does not respond, but the data analysis is detailed and the algorithm is accurate.

B）interface:

1. The pop-in and stop of the sleep state is the diffusion and contraction of the prototype, which is in line with the scene experience of opening and closing;

Long press and stop the countdown is very interesting, humanized

Starry sky and play scrolling are very suitable for quiet and sleepy scenes, and also consider the need to open the phone all night, there will be eye-catching power prompts;

2. The mall tab interface is doing very well, the left and right information and the shopping cart are hidden.

Pros

The function of ChaoxiAPP is more perfect than the similar ones and introduces the concept of tomato clock, which attracts a large wave of students and creative staff. At the same time, different greetings and background images of the day give people a feeling of being cared and paying attention to the emotions of the users.

Cons

Chaoxi APP has fewer scenes to choose from, the product has weak playability, and the product operation path is too deep.

Future Insights:

Because APP has more comprehensive functions and a group of loyal users based on white noise tomato clock, it should simplify the function operation path, perfect function points, maximize the advantages of combining the tomato clock, and highlight this function.

Threat

There are many similar white noise applications on the market, small sleeps that focus on sleep, taomix 2 that cares about rest and sleep, etc., and their playability is stronger than the tide.
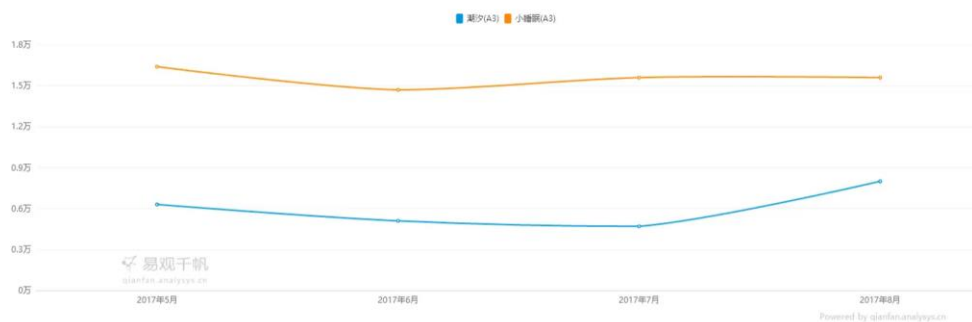
User gender, age, etc.

User gender:

The use of users is mainly female, accounting for 60.75%, while male users only account for 39.25%.
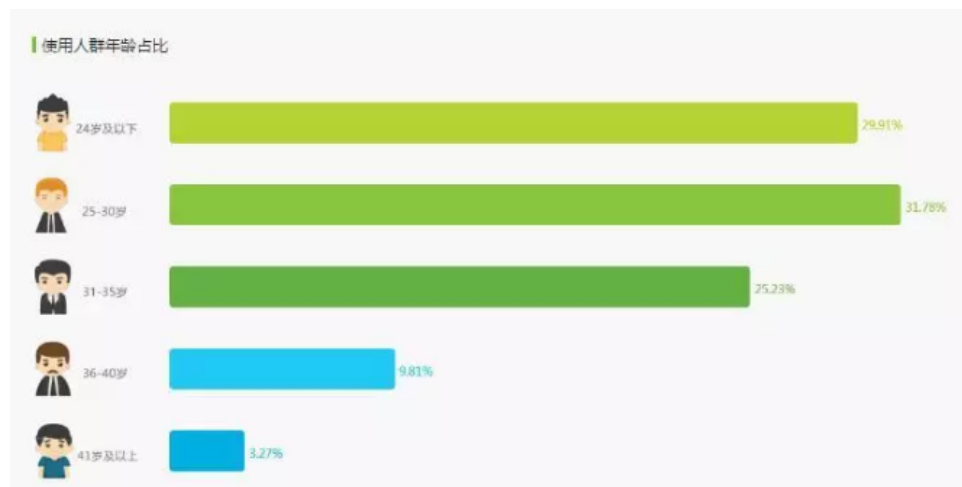
User age:

Users are mainly composed of 25-30 years old, accounting for 29.91%, accounting for 29.91% under 24 years old, 25.23% for 31-35 years old, and relatively few groups of 36-49 years old and 41 years old, only 9.81% and 3.27% respectively.

User size

This market is a niche market and there are not many active people. At the same time, the active users of small sleep are about 2-3 times of the tide, which is related to the free business mode of small sleep and more grounding. The music scene of small sleep is more, and its gameplay is more diverse and can adapt to different ages. The user, while the tide of free music scenes is relatively small, which also caused the users of small sleep far more than the tide.

User stickiness

The number of starts per person in the tide is slightly ahead of the small sleep, which is related to the positioning of the tide. The tides subdivide the user scene and introduce the concept of the tomato work method, which increases the chance of users opening the use. While small sleep is more focused on sleep, it is usually used at noon or at night, and the daily average of 1.83 is in line with user behavior.

Age of US adults that used Sleep Tracking Apps

15% of respondents aged 18~29 years regularly use a sleep tracking app
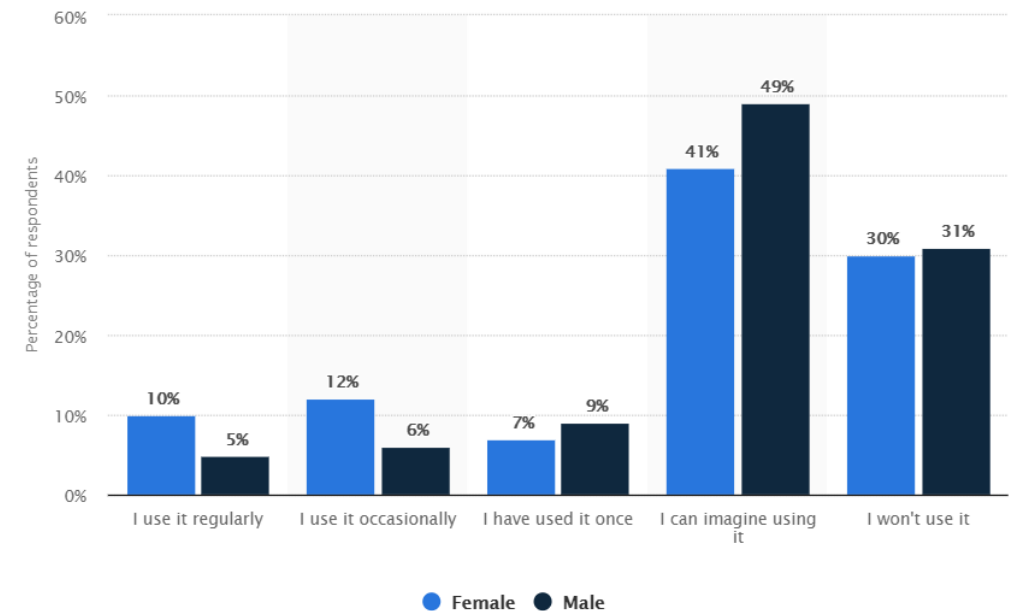
3% of respondents aged 61+ years regularly use a sleep tracking app
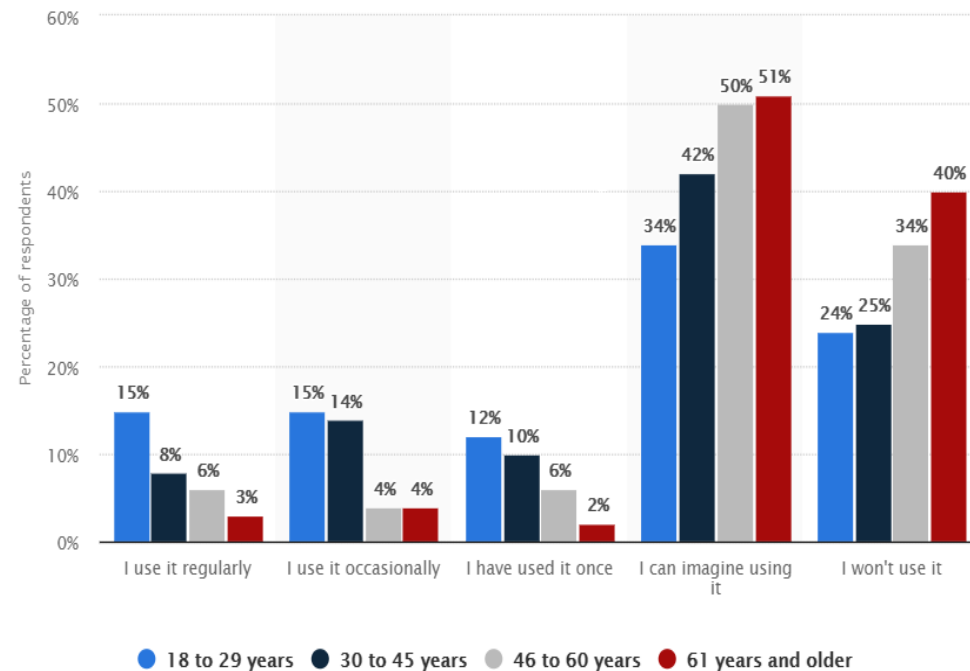
Gender of US adults that used Sleep Tracking Apps

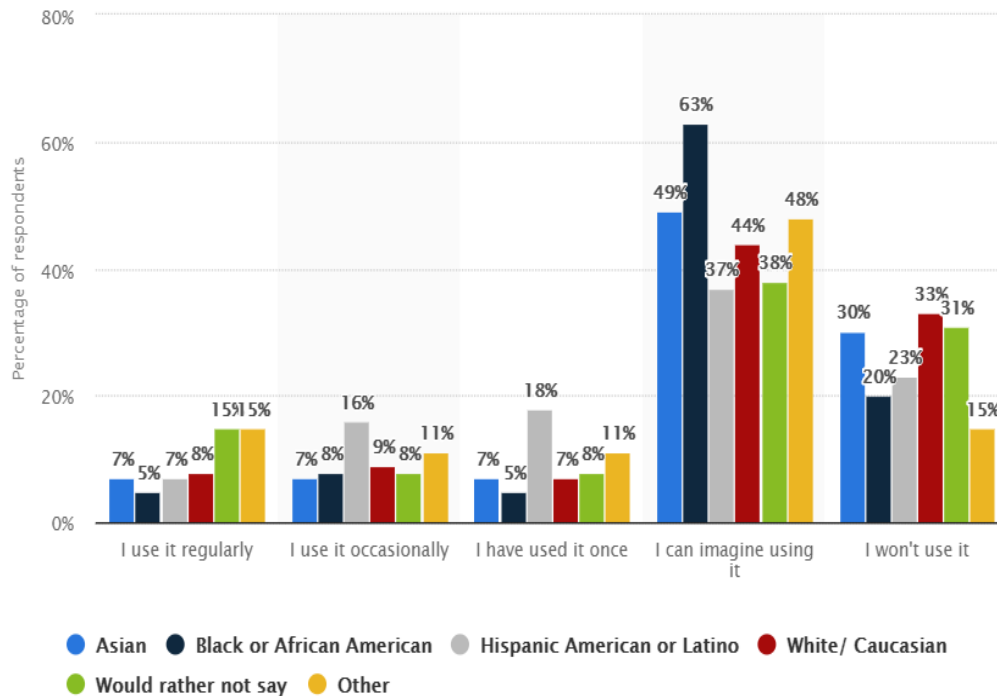10% of females responded that they regularly use a sleep tracking app

Only 5% of males responded that they regularly use a sleep tracking app


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Ethnicity of US adults that used Sleep Tracking Apps

In total, 7% of Asian and Hispanic American or Latino respondents indicated

that they regularly use sleep tracking apps

Community of US adults that used Sleep Tracking Apps

12% of people in city or urban communities occasionally use sleep tracking

apps

7% of people in rural communities occasionally use sleep tracking apps

31
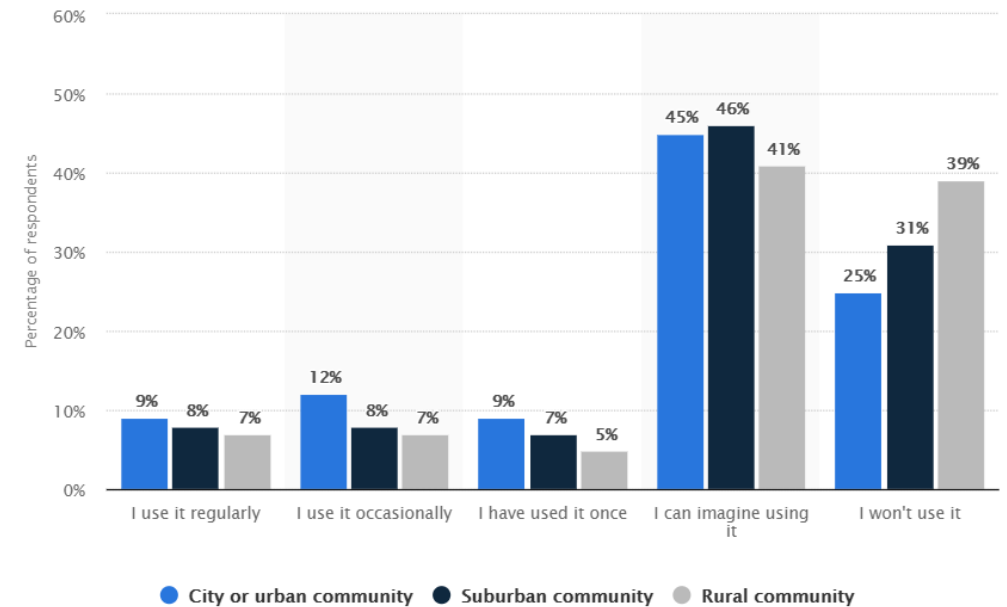
03

Heuristic Evaluation

Expert Analysis On Several Sleeping Apps

Heuristic Eval

Sleep As Android | Sleep Cycle | Snail sleep | 小睡眠

---

1. **System Visualization:** How well a user can keep track of the system's status through appropriate feedback. Beautiful and minimalistic design

Evaluation Criteria	Grading (1-5) 1 - Not At All 5 - Very Much	Average Grading
Does every page have a title?	5 4 5	4.75
Does the title accurately describe the contents of the pages?	5 4 5 5	4.75
Are all icon styles consistent?	5 5 5 4	4.7
Can you significantly tell the difference between the selected icons and the unselected icons?	5 5 5 5	5
Does the menu and pop-ups appear at the same location in all pages?	3 5 4 4	4
Did the fonts and background colors do not go overboard?	5 5 5	5
Is there a reasonable margin, segment spacing and line spacing in the text display window?	3 5 4 4	4
Is the time taken for simple, commonly used operations less than 1 second?	5 5 5	5
Is the time taken for complex operations less than 12 seconds?	4 5 5 4	4.5
Is the color, brightness and contrast between the image and the background coordinated?	3 5 4 3	3.75
Is only necessary information displayed in the interface?	5 5 5	5
Is every icon clearly distinguishable from its background?	5 5 4	4.5
Is the interface visually appealing overall?	3 5 4	4

---

2. **Intuitiveness:** Use of languages and concepts that a lot of users are familiar with. Natural and logical display of information.

Evaluation Criteria	Grading (1-5) 1 - Not At All 5 - Very Much	Average Grading
Can the user intuitively understand the meaning of the icon?	2 3 4 3	3
Does the organization of menu items (i.e., categories, order, etc.) conform to the user's logic?	3 5 4 4	4
Are associated contents displayed together?	3 4 4 4	3.75
If a chart is displayed, is the chart easy to understand?	2 5 5 5	4.25
Is the language concise, clear, and accurate (without ambiguity and syntax errors)?	5 5 5	5
Is the term in the interface a term used by the user, not a computer term? (i.e., 'No Internet Connection' vs. 'Error Code 2119 this.getConnection=404')	5 5 5	5
Are important options and information highlighted using different characters, boldfaces, underscores, colors, shadows, or special typography?	3 5 4 4	4
Are the important buttons in the interface larger than others?	2 5 4	3.75
Is the app easy to easy to learn, use and remember for new users?	3 5 5 4	4.25

---

3. **Error Prevention & Freedom:** How much possible errors are prevented with design. The amount of freedom to control within a reasonable range. The user should be able to freely choose a task to perform and conveniently go back and forth between operations.

Evaluation Criteria	Grading (1-5) 1 - Not At All 5 - Very Much	Average Grading
Does a confirmation window pop up when a user is about to perform a destructive operation (such as deletion, formatting)?	5 5 5	5
Is the "undo" operation supported?	5 1 3 3	3
Can a user easily cancel an ongoing operation?	3 5 5 4	4.25
Can a user use the functionalities of "Copy" and "Paste" to save input time when entering data?	5 5 5	5
Is it convenient to return to the previous page?	3 5 5	4.5
Can users customize their visual settings such as the background theme?	5 1 4	3.75

---

4. **Consistency:** The terminology and display should be consistent.

Evaluation Criteria	Grading (1-5) 1 - Not At All 5 - Very Much	Average Grading
Is the font in different pages consistent?	5 5 5	5
Is the text alignment in the interface consistent?	5 5 5	5
Are the menu items uniform (including language style and visuals)?	5 5 5	5
Are there no more than 3 types of font styles per page?	5 5 5	5

Sleep As Android   Sleep Cycle

List of Problems

Cons		Possible Solutions
• Icons are not intuitive • Ex) Noise　Lullaby Tutorial　Advice		• Re-design the icons to be more understandable at first glance • Ex) Lullaby　Tutorial Noise　Advice
• Graphs are difficult to understand • Ex)		• Include clear, readable and understandable axis labels
• Important buttons don't stand out • Ex)	No back button to return to the previous page & no access to the menu at a specific page Ex)	• Make important buttons stand out more by using bolded fonts, big buttons and eye-catching colours • nclude a back button to return to the previous page or include a menu icon on the page • Ex)
• Zero customizability • Ex) No option to change the background theme, font size, etc.		• Include setting options that allow users to change their background themes • Ex) White background for people who want to read clearly • Ex) Black background for people who think bright background hurt their eyes
• Icons are not intuitive • Ex)		• Re-design the icons to be more understandable at first glance • Ex) Journal
• Undo operation for deleting important data not supported • Ex) Delete this day After deleting a day's worth of sleep data, you cannot undo and restore the data		• Include an 'Undo' operation that restores the most recently deleted data in case a user changes their mind

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Snail sleep   小睡眠

List of Problems

Cons		Possible Solutions
• The interface has too much empty space • Ex)		• In favorites sound page, when there is no collection at all, it is better to jump right to the audio selection page. • Include options that allow users to mark the current sound as a favourite sound
• When a registered user tries to sign up again, a pop up message appears saying 'the user's already registered'. • Ex)		• The pop up message is unnecessary and the message can just appear on the log-in page
• In all five tabs, there's too many ads • Ex)		• Having advertisement in each page will reduce the user's interest in using the software. It is recommended that the advertisement to be on a separate page. • Refine classifications and reduce unwanted sections
• There is excessive amount of user classifications (i.e., student mode, senior mode, etc.) • Ex)		• Refine classifications and reduce unwanted sections
• The descriptions of the sounds are too ambiguous and difficult to assume what they are. Also, there are too many sounds options to choose from • Ex)		• You can add [Recommended] section after the [All] section. • Have less categories and less sounds in each category • Better and concise description of the sounds
• When the alarm does not go off, the warning message that pops up is not eye-catching and is hard to read • Ex)		• Place the warning in a more prominent position. • Possible solutions include making the font size bigger, highlighting the texts, etc.

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04

User Tests

User Tests on 'Sleep As Android' App

Pre-questionnaire Results

User #1: Kei Hsu
Level: Beginner

- Used a sleeping app before

- Have not used it because I know I wouldn't be able to use it consistently, so I'd rather not start.

- I am interested in sleeping apps to see how well/not well I sleep in a night and hopefully improve myself

- I identify my skill level with using smartphones (i.e., learning how to use new apps quickly, knowledge of universal icons such as trash can icon referring to delete button)
as 7/7

User #2: Ming Aimpawee
Level: Expert

- Uses sleeping app everyday

- Used a sleeping app called 'Sleep Cycle'

- I am interested in sleeping apps because I am curious on my sleeping cycle

- I identify my skill level with using smartphones (i.e., learning how to use new apps quickly, knowledge of universal icons such as trash can icon referring to delete button) as 6/7

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Task 1
Start sleep tracking
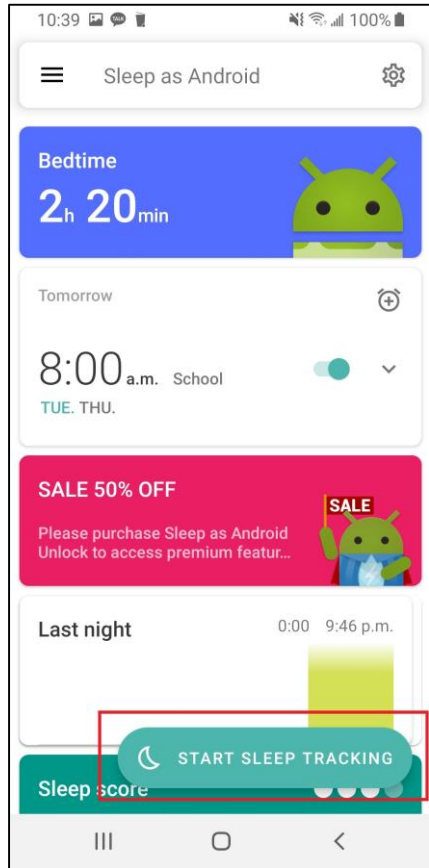
Task 2
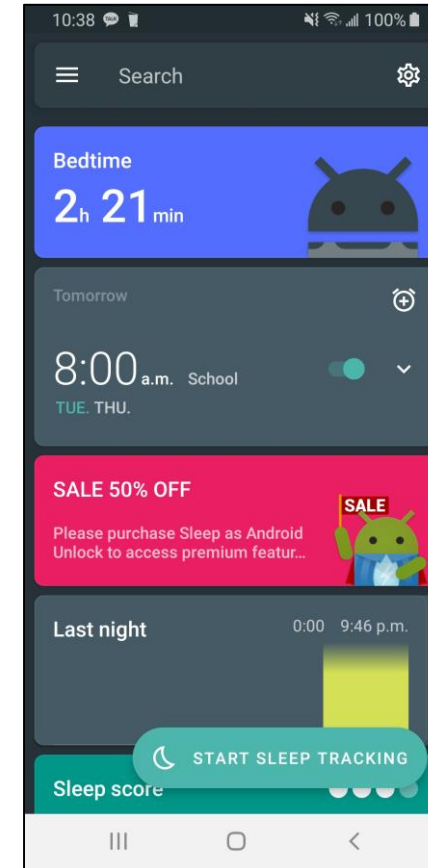Turn on a lullaby called 'Whale Diving,' listen to it for 5 secs then stop the noise
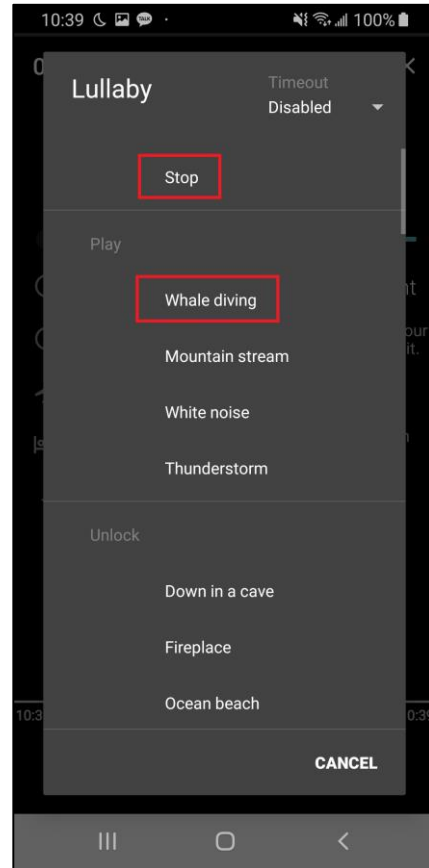
Task 3
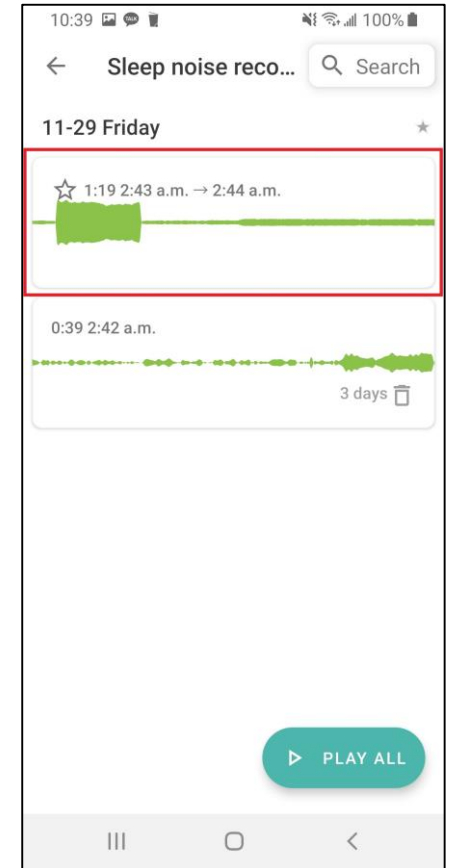Stop sleep tracking and delete its sleep record. Then undo the deletion
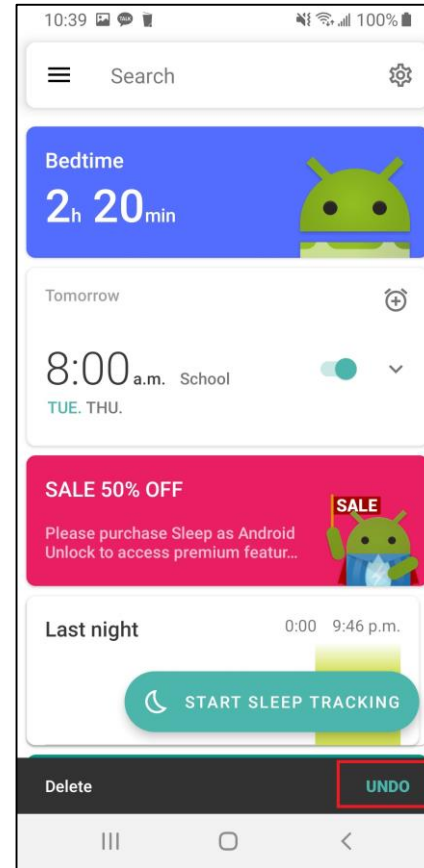
Task 4
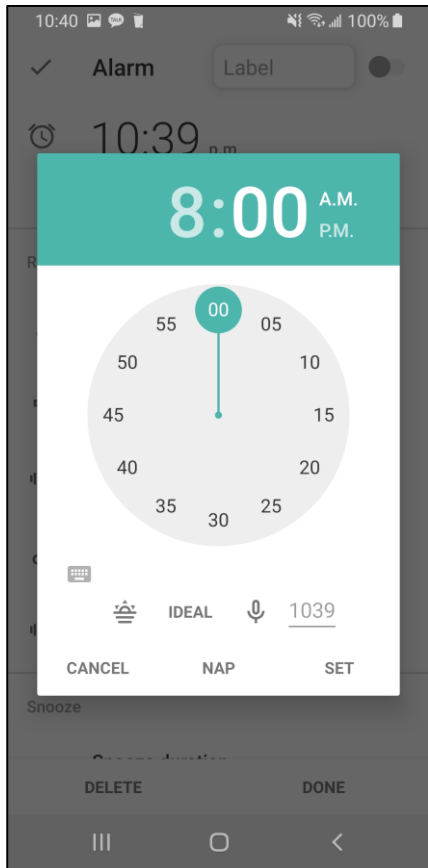Change the app to a darker colour theme

Task 5
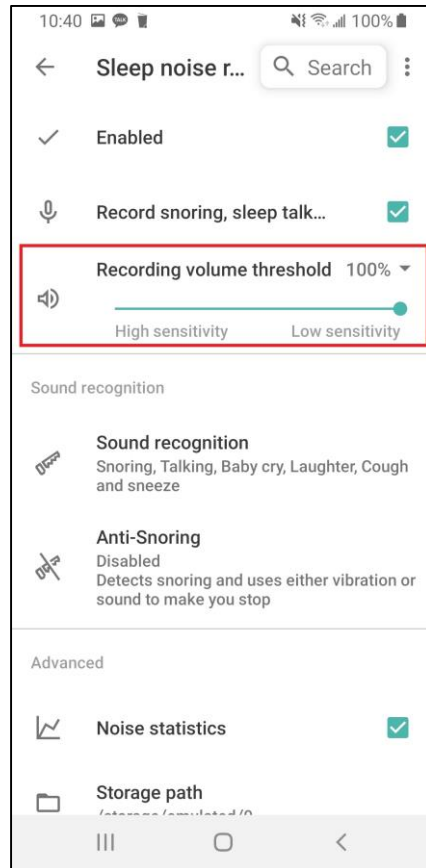Listen to one of the recorded sounds that the user made during sleeping

Task 6
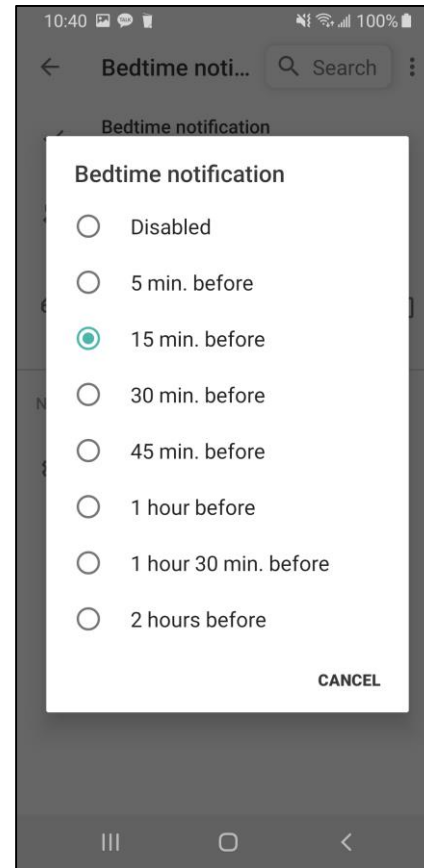Add an alarm named 'School' that goes off every Tues and Thurs at 8 AM

Task 7
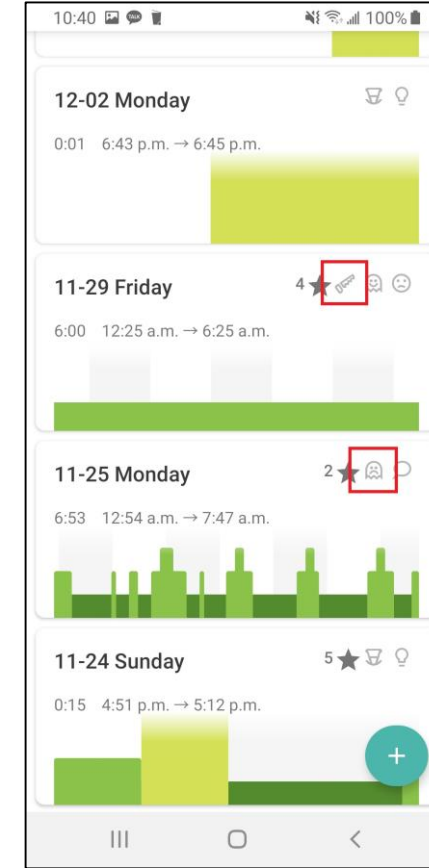Set the sleep noise recording volume to max

Task 8
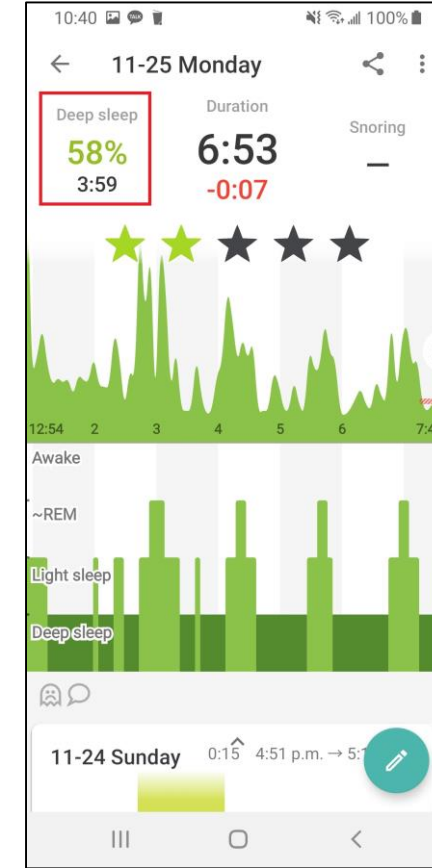Set a notification that tells the user 15 mins before bedtime

Task 9
Find out which day the user snored and which day the user had a bad dream

Task 10
Find out how much deep sleep the user got on Monday, Nov. 25th

Kei   Ming

	Time Took to Complete the Task	Think Aloud	Analysis
Task 1 Start sleep tracking	00:05.00	There you go	No issues.
	00:06.00	Okay	
Task 2 Turn on a lullaby called 'Whale Diving,' listen to it for 5 secs then stop the noise	00:32.00	Uhh, here it is	User 'Ming' had trouble locating the lullaby icon. Both mistook the pause button for stopping the lullaby, whereas it was for pausing the sleep record
	00:43.00	Where is the lullaby? I can't find it	
Task 3 Stop sleep tracking and delete its sleep record. Then undo the deletion	00:11.00	Stop.. Done	No issues.
	00:15.00	You want to delete this? Sure, delete. Undo.	
Task 4 Change the app to a darker colour theme	00:35.00	Miscellaneous!	User 'Ming' had trouble finding the settings for changing the colour theme.
	01:00.00	It's the same thing! Whoo! Smartlight? Oh! Night Owl, I like that.	
Task 5 Listen to one of the recorded sounds that the user made during sleeping	02:09.00	Weird.. It doesn't show up even if I find it.	Both users could not notice the menu button for a while.
	05:11.00	Umm.. It's not here.. Sleep tracking.. I cannot find it. Sleep noise recording..? Sleep recording? Mm... I might take forever. By the way I like how there's many functions	

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Kei   Ming

|	Time Took to Complete the Task	Think Aloud	Analysis
Task 6 Add an alarm named 'School' that goes off every Tues and Thurs at 8 AM	00:28.00	This is pretty straight forward. School right? When was it?	No issues.
	00:40.00	8.. oh, it's AM sorry. Name school…	
Task 7 Set the sleep noise recording volume to max	00:18.00	Uhh did I do this right?	No issues.
	00:25.00	Set the sleep noise.. To max?	
Task 8 Set a notification that tells the user 15 mins before bedtime	00:14.00	Notification.. Oh it's right here.	No issues.
	00:09.00	It's pretty similar to the one I used before, so..	
Task 9 Find out which day the user snored and which day the user had a bad dream	01:30.00	Oh is the saw icon for snoring because it makes sound?	Icon is not intuitive. It is difficult to understand the meaning of the icons.
	02:43.00	I can do that? The one with the saw is the sound and the one that looks like the ghost is the bad dream	
Task 10 Find out how much deep sleep the user got On Monday, Nov. 25th	00:09.00	58%?	No issues.
	00:17.00	Monday.. November.. 58%.	

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#1:

- Both expert and beginner user faced the same problems. In fact, beginner user completed the tasks faster. No significant time difference were noted between the users.
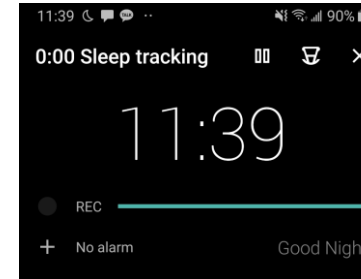
#2:

- Task 2, 4, 5 and 9 were problematic.

#3:

- The stop button for the lullaby is in the lullaby pop up window but it is not noticeable.
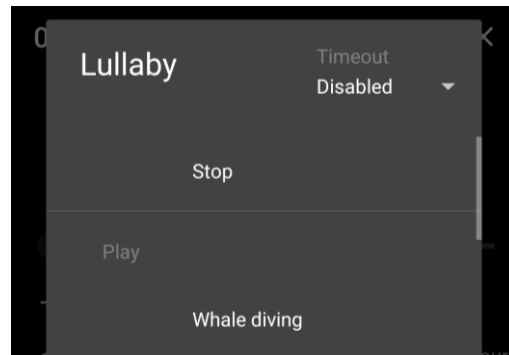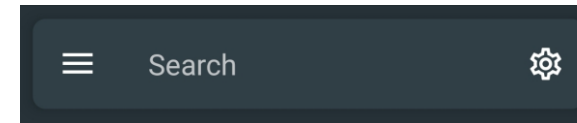

#4:

- The pause button on the sleep recording page is mistaken as a button for stopping the lullaby. In fact, it is for extending the start time of sleep recording.
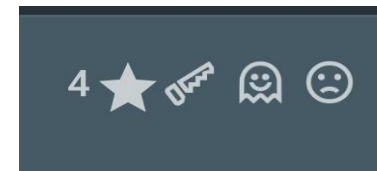

#5:

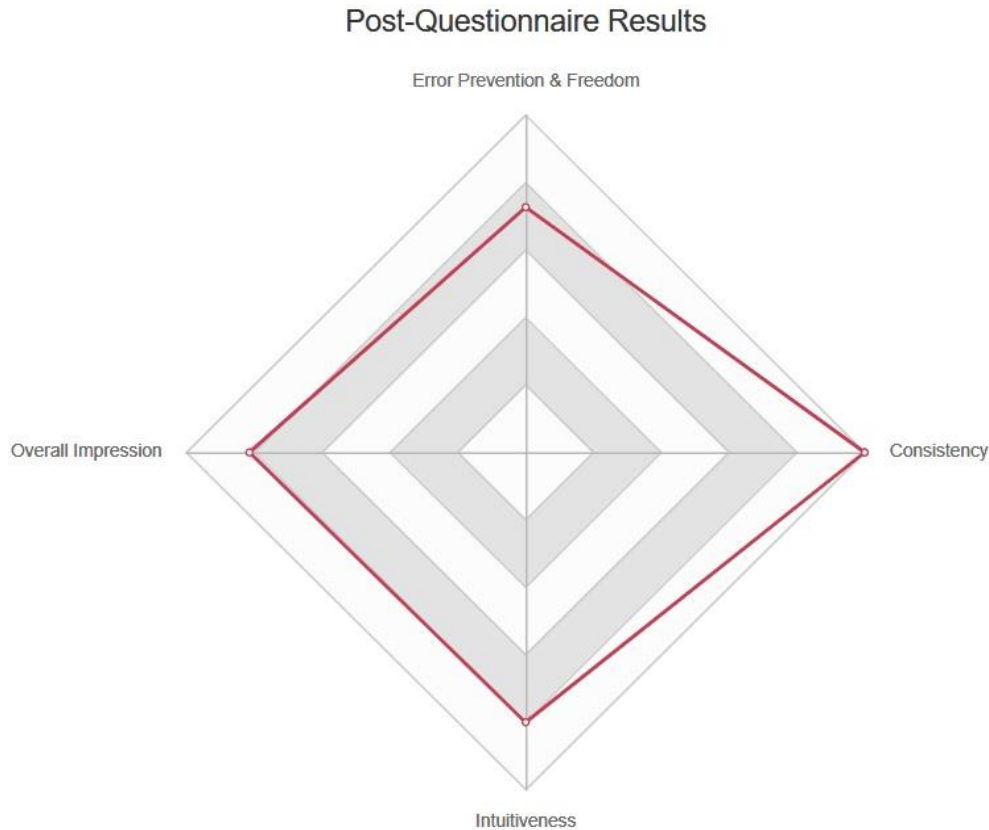- It takes a long time to notice the presence of a menu button.

#6:

- Icons are not intuitive. They are very difficult to understand.

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Post-Questionnaire Results

System Visuals:

- 168/196 = **85.7%**

Overall Impression:

- 8/10 = **80.0%**

Consistency:

- 55/56 = **98.2%**

Intuitiveness:

- 99/126 = **78.6%**

Error Prevention & Freedom:

- 70/98 = **71.4%**

Easiest Task:

- Start sleep tracking

Most Difficult Task:

- Find out which day the user snored and which day the user had a bad dream

Best Quality of the App:

- Details of the sleep
- Various features and functionalities

Worst Quality of the App:

- Icon's intuitiveness

05

App Planning

Ideas for customized sleeping app

Features to Keep

- Graphical representation of data

- Sleep recording

- Custom alarms

- White noise / lullaby

- Sleep noise recording (I.e., snoring, sleep talking, etc.)

New Features to Add

- Connection and control over user's pillow

- Diet recommendation that helps the user's sleep quality

Features to Remove

- Weekly report

- Sharing data with people

G9 Sleep

As a sleep care companion app, it will accompany you through beautiful nights, develop good sleep habits, sense and record your sleep process, provide you with visual sleep reports, and help you better understand sleep. At the same time, the app also has functions such as smart alarm clock reminders, lullaby playback and download.

G9 Sleep
Mood board

- Dreamy
- Mystical
- Calm
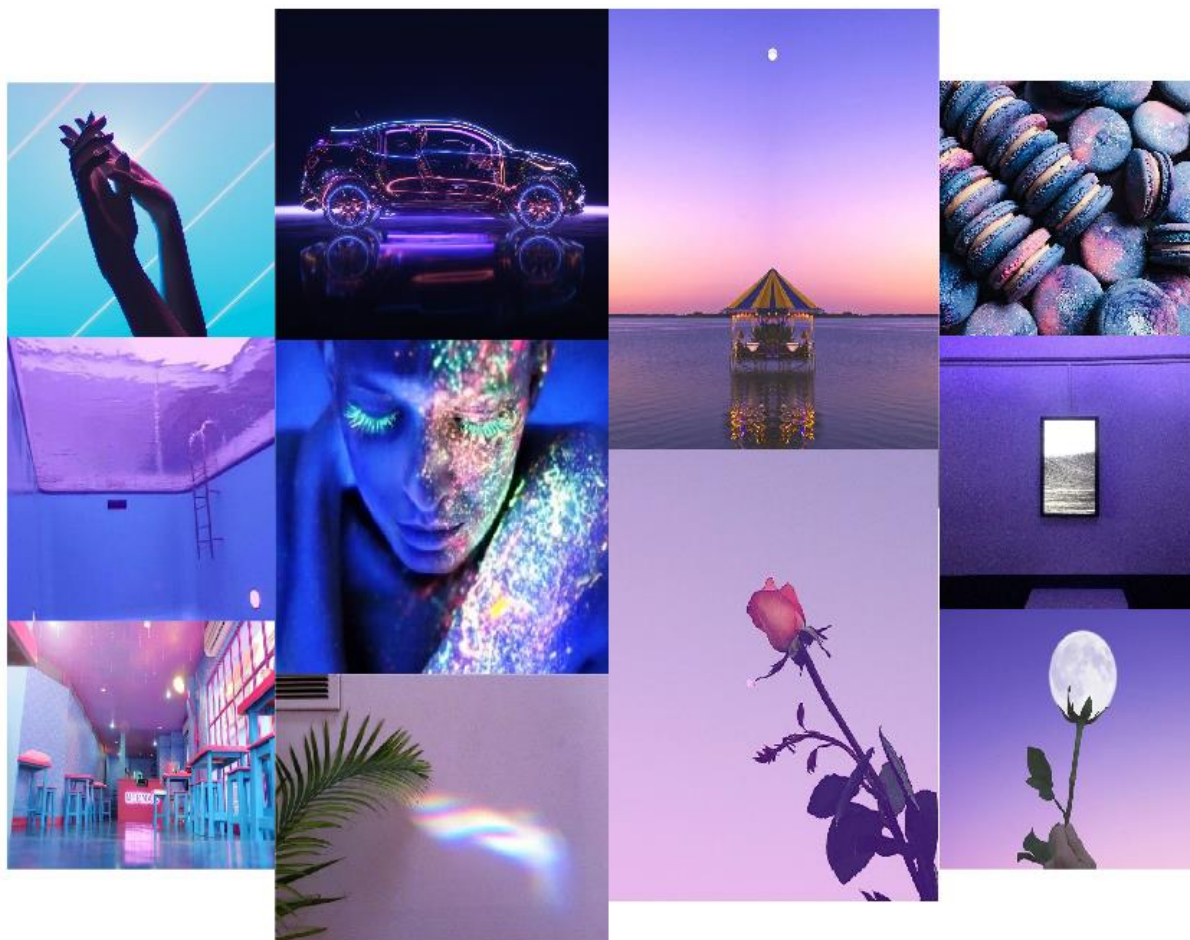
#FEDCED

#D7B8FE

#A27FF9

#8164EC

#432E79

G9 Sleep

Introduction

As your pillow sleep companion app, we will also help you learn more about your sleep habits, capture your dreams and snoring during sleep, and life during the day is full of fun, then we can't have fun in the unknown state at night Let it go, record your dreams, and learn about your sleep. At the same time, the software also has the function of a smart alarm clock. In the morning light sleep, the soft and relaxed original alarm clock ringtone will wake you up. And daily updated recipes to help sleep, a healthy diet, healthy sleep. New day, healthy life!

G9 Sleep

App introduction

At the beginning of the new day, the smart
alarm clock wakes you up during your light
sleep. The soft and easy original alarm clock
ringtone helps you to get rid of the sudden
wake up by the alarm clock, so that getting up
is no longer painful, and the new day is full of
energy.

G9 Sleep
Introduction

When you have difficulty falling asleep at night, "G9 Sleep" also provides original sleep music verified by sleep experiments. Through original sleep music combined with sleep science theory, it will bring you into a relaxed and soothing state, helping you to fall asleep quickly.

G9 Sleep
Application highlights

Sleep report:

The identification of insomnia recorded in G9 sleep has been compared with a large number of professional sleep laboratory tests, and compared with professional EEG and ECG sleep monitoring equipment, the sleep data is compared, and the sleep algorithm matching and optimization for different models of equipment is guaranteed Accuracy of sleep data recording.

G9 Sleep
Application highlights

Sleep music
The original sleep music that incorporates the science of sleep science is created by top musicians and sleep scientists in collaboration to help you fall asleep quickly. The original sleep music has been verified by professional sleep laboratories and has been verified by a large number of experimental volunteers to help sleep.

G9 Sleep
Application highlights
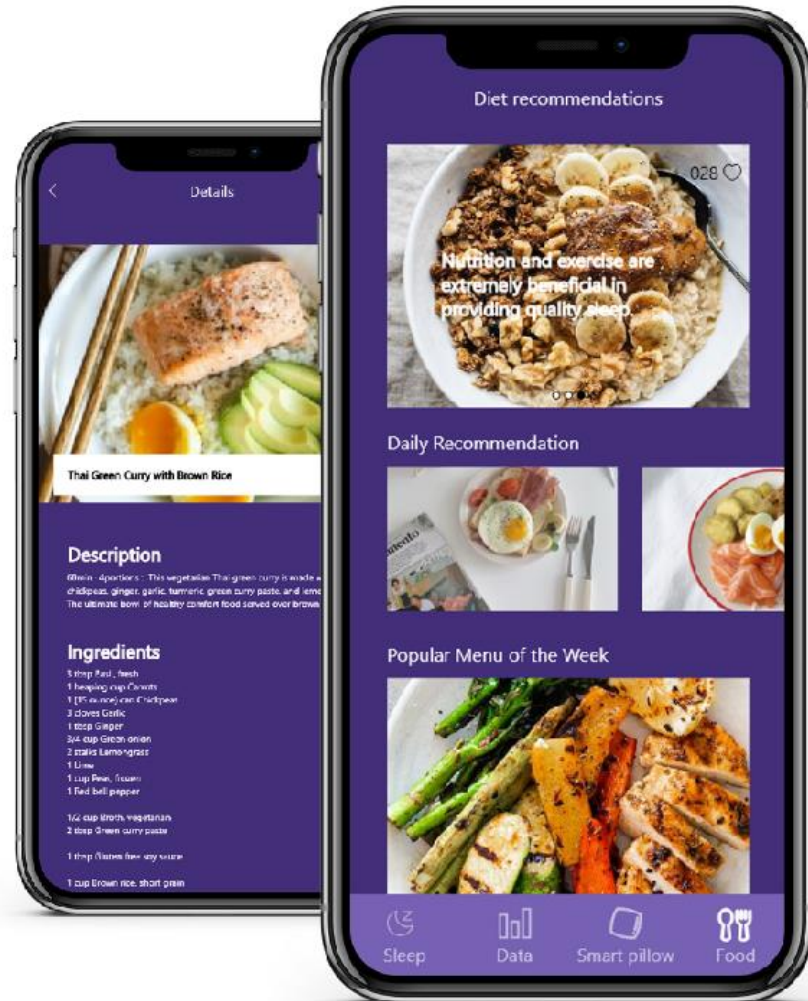
Diet recommendations

The healthy diet plan recommended by a health management expert can effectively help users to eat healthy foods. The burden of a healthy diet on the stomach is reduced, so it is also helpful for sleep. It also allows users to eat healthy and sleep while improving their quality of life.

Du Chuchu 2017220060
Hee su Kim 2019952119