

## **Sleep for All**

We know all too well that our days are defined by how we spend our nights. But what if you could guarantee that every night was sated with slumber so that every day brimmed with brilliance?

We created Casper because better sleep makes for better living.

We constantly innovate sleep research, products, and services because it's our mission to help everyone achieve their best life possible.

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Casper is a purveyor of cutting edge mattresses, sheets, and pillows designed to upgrade your sleep. They were one of the pioneers of the online "bed in a box" business model that kick started the creation of a myriad of competitors such as Helix, Tuft & Needle, and Leesa among others. As a company obsessed with perfecting sleep, they want to produce a companion app so that Casper users can get the most out of their products by improving their sleeping habits and have more fulfilling days. In essence, Casper's Dream Team companion app will serve as a bridge between the users' sleep and waking lives by gathering information from both states and delivering advice that will improve their sleep habits.

Research and interviews indicated that people who have used various sleep tracking apps in the past, were quick to uninstall. The main reason cited was that while some of the apps provided detailed information on their sleep patterns, the app data visualization left much to be desired. Additionally, users were left at their own peril attempting to decipher how to adjust their sleep hygiene routines.

Casper's' new innovative app Dream Team, solves this dilemma by replacing raw data with actionable, time and place relevant instructions, that users can follow. The app further removes the need for the user to actively inform the app of their habits and needs, as Dream Team integrates with their calendar, traffic API's and device sensors to learn their scheduling needs and sleep patterns, to proactively prompt the user to take action.

Another pain point identified was the human habit of pattern learning, which leads to many people to simply hit the snooze button without realizing they went back to sleep. Dream Team addresses this problem by randomizing a swipe pattern the user needs to interact with in order to snooze the alarm. This slight cognitive load helps with the brains 'initialize procedure', and eliminates the possibility of learned, automatic snoozing. Additionally, in order to provide the best wake-up experience, the app employs 'smart alarm' technology, whereas a pleasant invigorating tune is played, gradually increasing the volume until the user is fully awake.

Finally, in order to verify the person is up and running, a cheeky cat and milk game is played, which requires much higher level of accuracy, concentration and cognitive load, that will indicate that person is fully awake and out of bed.

Lastly, to round up the full morning experience, Dream Team links to the users favorite navigation app (Waze, Google Maps, etc.) to provide a harmonious full morning routine cycle.

# **Executive Summary**

## Background Research

#### **BACKGROUND RESEARCH**

Our starting point began with the Casper brand itself. Initially, we wanted to understand Casper's value proposition, target consumer, brand ethos, and brand voice. After conducting this research, we arrived at the following assumptions:

- User centered design is at the heart of their product development philosophy.
- Casper aims to be perceived as genuine, boutique, community-conscious, transparent, and forward thinking.
- Casper is dedicated to solving real problems in the bedroom and the industry.
- Casper targets twenty and thirty somethings who don't have back issues, but just want to improve their sleep.
- The mattress industry offers too many choices, which perplex consumers.

Casper's marketing and business model is intended to convey to their target audience that their products were designed with their needs in mind akin to the way the iPhone offers very limited models to its entire user base. Moreover, their friendly tone and e-commerce based business model diverges drastically from the stereotype of a mattress sales person trying to push a certain model to meet sales quotas.

#### **COMPETITOR ANALYSIS**

In assessing the market landscape of sleep applications, a very saturated market, we identified a few key niches based on function:

- Pre-Sleep: These applications primarily focus on producing soothing sounds that would accompany one's pre-sleep routine. Their goal is to decelerate the mind into a relaxed state that is conducive to sleep.
- Sleep Trackers: This set of competitors use motion sensors in order to provide users, data regarding their sleep patterns such as the amount of REM, light, and deep sleep the user experiences. Their goal is to provide trend data that hopefully helps users understand their sleep.
- Smart Alarms: This set of competitors focuses on improving upon the traditional alarm clock. Through the use of incremental volume, basic sleep tracking, and providing a variety of sounds to choose from, their goal is to create a more organic waking cycle.

See next page for a feature analysis of our key competitors across all of these categories.

#### FEATURE ANALYSIS

Features	Pzizz	Sleep cycle	Digipills	Sleep genius	Jawbone up	Sleepace	Smart alarm clock	
Pre-sleep relaxation								
Length Adjustment	Yes	Yes: ability to customize wake up window of time	No	Only three options, 90/180/all night.	None	No	Yes, but it is slightly hidden	
<b>Music Selection</b>	Chosen for you. Soothing sounds that constantly change.	Only the sounds available within the app. About 15 to select from.	Only within their app store	Very limited. Just a few sounds.	None	Very limited. Just a few sounds.	Only from their select sounds. You can download additional ones too, but they are paid.	
ALARM (WAKI	NG UP)							
Ability To Set Multiple Alarms	No	Only weekday/ weekend set up	No	No	Yes	Seems like you can, but very difficult to find.	No	
Wake Up Window Of Time	No	Yes	No	No	Yes	No	Does this automatically. Wakes you up in the lightest stage of sleep that is near your wake up time.	
Alarm Sounds	itunes integration	Yes	No	Very limited without premium	Vibration only	Very little	From their selection	
Power Nap Module	Yes	No	No	No	No	No	No	
Wake Up Mood Trakcer	No	No	No	No	Yes, but not automated	No	No	
Sleep Tracking								
Monitors Length Of Time	No	Yes	No	No	Yes	Yes	Yes	
Sleep Stage Monitor	No	Yes	No	No	Yes	Yes, but very vaguely. Simply categorized into weak and strong.	Yes	

Features	Pzizz	Sleep cycle	Digipills	Sleep genius	Jawbone up	Sleepace	Smart alarm clock
Motion Detecction Options	No	Yes	No	No	No	No	No
Method Of Tracking	N/A	Phone on bed	N/A	Phone on bed	Wearable based/ also can put phone on bed	Place phone on bed or connect to Rest On, Nox, and Sleep Dot.	Phone on bed
CUSTOMIZATION	ONS						
Favorites Section	Yes	No	No	No	No	No	Yes, but applies to sounds only
Ability To Edit Sleep Notes	No	Yes	No	No	Yes, but limited.	No	No
<b>STATISTICS</b>							
<b>Trend Analysis</b>	No	Yes	No	No	Yes	Yes	Yes, but limited
Wake Up Mood	No	Yes	No	No	Yes	No	No
Retroactive Log	No	Yes	No	No	Yes	Yes	Yes, but quite limited.
Verdict	Primarily focused on putting you to sleep, their value proposition is in the ever changing selection of sounds.	Great sleep tracking app if you don't have a wearable. Robust features, but you have to remember to put phone on the bed. Could benefit from more customization.	Very limited features and forces you to purchase each one. However, they specifically target the ills that prevent people from achieving a good night's sleep.	Primarily a pre- sleep app, the interface hides many of the features and limits customization. Offers very limited sleep tracking.	Great branding and robust functoinality. With a jawbone wearble, it can automatically detect you are a sleep, but doesn't offer sounds to help you fall asleep.	Simple entry level sleep app that doesn't offer rich information. This app doesn't do any particular function well, but does what most sleep apps do mediocrely without connecting to another device.	Limited smart alarm clock that features basic sleep tracking, but offers limited customization.

#### **KEY TAKEAWAYS**

- No sleep tracking app learns from your sleep and offers advice on how to improve your sleep habits.
- Limited sounds and integration(iTunes only) for both pre-sleep and alarm sounds.
- No competitor encompasses pre-sleep, tracking, and smart alarm features in one.
- Only two competitors offer rich data when connected a wearable or other device.

#### **OPPORTUNITY**

- Providing insights from tracking data that teaches users how to use this data in a meaningful way.
- Including additional sound and music integrations to enhance customizability.
- Devise an all encompassing solution as oppose to niche functionality.
- Eliminate the need to purchase additional hardware such as a wearable to promote adoption.

## Heuristic Analysis

Beyond functionality, the degree of usability and emotional connection an app fosters determines how "sticky" it will be. In order to assess the usability of competitor applications, we implemented the Nielsen Norman heuristics method, which is considered an industry standard. Our approach to assessing usability consisted of three UX designers attempting the primary task that each app advertises it specializes in. For sleep tracking apps in particular, one of our team members used the app on an iPhone 6 by itself and in conjunction with a wearable over the course of several days.

#### **KEY TAKEAWAYS**

- Very little use of helpful notifications or reminders across all competitors except Jawbone UP.
- All competitors except one hid most functionality behind a hamburger menu, which made functions not only invisible, but showed a lack of prioritization.
- Many competitors did not follow iOS conventions that are familiar to users. All
  competitors except for one would offer tutorials when user would erroneously interacts
  with a certain element.

#### **OPPORTUNITY**

- Design a navigation that allows users to know where they are and what is available.
- Include transitions and haptic feedback that arouses an emotional response on the part of the user.
- Include pro-active error prevention methods so users can easily understand how to use the app without discouragement.
- Closely follow conventions users are accustomed in other applications even if they break conventions seen in sleep applications.

Competitors	Pzizz	Sleep Cycle	Digipills	Sleep genius	Jawbone up	Sleepace	Smart alarm clock
Visibility of system status							
Match between system and Real world							
User control and freedom							
Consistency and standards							
Error prevention							
Error management							
Recognition rather than recall							
Flexibility & efficiency							
Comments	Check-boxes couldn't be unchecked. Offers both swipe gestures and buttons to navigate the UI. Settings are hidden and inaccessible. There is no on-boarding.	Visible bottom navigation and highly customizable features. Easily distinguishes premium features without cluttering the UI.	Provides no way of returning to a screen other than back button, which requires remembering where a function is.	Doesn't follow HIG conventions, which makes it difficult to recognize functions. Menu buttons and icons were not apparent.	Excellent ui and clear tutorials appeared when an interaction error was made. Many interactive elements that were pleasant to use.	Very disorienting application. Offered no flexibility or customizations.	Minimal design that focuses on alarm functions, but makes other functions very difficult to find. Tutorials are helpful, but extremely hidden.
Legend				Mediocre	Addresses t	his function, but doe	esn't make it accessible.
Excellent	Preempts user behavior and surpasses expectations.			Very Little	Hidden or un-prioritized function/design.		
Adequate	Follows convention, but doesn't please users.			Poor	Inability to perform this type of function.		

## User Research

#### **USER SURVEYS**

Our survey, filled out by 50 people, was designed to test our assumptions that came out of our previous research and uncover overarching trends amongst the target consumer. In particular, we were aiming to dig a bit deeper into the following themes:

- What prevented people from getting a good night's sleep.
- The degree of experience user's had with sleep applications and other sleep improvement methods.
- How people perceived the quality of their sleep.

#### Key Takeaways

After conducting the survey, we deduced the following insights:

- 1. Most of our participants were not satisfied with the quality of sleep they were getting.
- 2. The majority of participants had difficulties getting to sleep.
- 3. The sleeping environment of our participants is being muddled by distractions, both environmental and intrinsic such as noise pollution, stress, and the use of electronic devices prior to bed.
- 4. Many of our participants claim to have a bad habit of over using the snooze function on their alarms.
- 5. Those participants with experience using sleep apps, reported most deleted the application after a short period of use because the data provided was un-insightful.
- 6. A vast majority of those surveyed indicated that wearables were not ideal companions for sleep apps, either because they found that it impedes with their comfort, or simply due to the fact that they needed the night hours in order to charge their device (e.g. *Apple Watch*) for the following day.



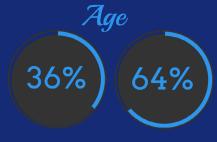












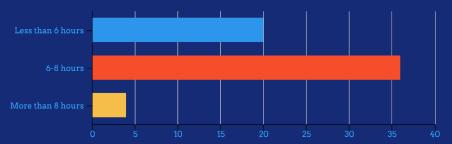


60%



18-25 yrs 26-35 yrs

### How Much Sleep Do You Get?



report feeling very tired on a regular basis.

68%
Had never tried sleep applications or to improve their sleep.



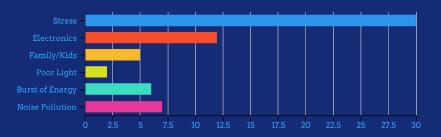


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60%

Report having difficulty falling asleep.

### What Gets in the Way of Your Snooze?



### Napping Habits

Early Bird/Night Owl











#### **EMERGING THEMES**

**Snoozing:** Most of our interviewees claim to have a bad habit of snoozing their alarm for about 15-30 minutes before waking up. They wish they could rid themselves of this bad habit.

**Naturally Wake Up:** Our interviewees all find their alarms jarring and would much rather prefer a "gradual" wake up process that doesn't demand they immediately get out of bed.

Noise Pollution: Many of our interviewees find background noise such as traffic, air conditioning, and neighbors to disrupt their sleep.

**Sleep Apps:** With the exception of one, our interviewees expressed interest in sleep apps, but found they didn't provide them any meaningful advice on how to sleep better. They also expressed that they didn't want to have to spend time understanding the raw data.

**Motivation**: Our interviewees didn't see any strong correlation to sleep tracking data and their lives. They would be more inclined to act on the data provided if it was somehow linked to their daily routine.



#### **USER INTERVIEWS**

After receiving survey responses, we intentionally went on to choose participants to interview who had expressed they had experience with sleep applications as well as those that didn't. In terms of sleep duration and quality, we did our best to maintain an even split, but ended up with a higher proportion of interviewees who perceived they had poor quality of sleep. Over the course of two days, we conducted 8 interviews, four of which were remote.

#### **NOTABLE QUOTES**

- " Used a sleep tracker, but stopped using because it wasn't useful. Just told me how I slept but not how to sleep better. "
  - Vincent Lai
- " I often wake up 15 minutes late due to the snooze function." Amanda Lin
- " I feel like I am fighting against my alarm clock." Amanda Lin

- "How my general quality of sleep in, what is my ratio of my deep sleep, light sleep... I've never dug into it too much." Steven Hsu
- " I feel so tired in the morning I snooze it 30 min every morning. Alarm doesn't wake me up from full sleep" Mike Salmon
- "You start getting the habit of snoozing, you start hitting the button when the alarms go off. I want to gradually wake up like 15 min or so. I do not like I have to wake up immediately." Mike Salmon
- "Sleep Cycle is easy, and I like the alarm because that music sounds very natural and pleasant. I usually snooze 3 times because the sake of sleeping in. Apple watch is a big NO NO, unless it has tracking data that actually do something. " Jason Huang

# User Quotes

## Solomon the Snoozer



Age: 27

Work: Data Scientist

Family: Single. Has a Pug as a pet.

Location: Jersey City, NJ

You start getting the habbit of snoozing, you start hitting the button when the alarms go off. I want to gradually wake up like 15 min or so. I do not like I have to wake up immediately.

#### **GOALS**

- Tame his racing thoughts before going to sleep.
- Wake up on time.
- Avoid overusing the snooze button.
- Get his sleep schedule on track.

#### **FRUSTRATIONS**

- Sleep apps haven't helped him understand his sleep or provide meaningful advice.
- Snoozes way more often than he would like.
- Alarm clocks are jarring and don't seem to follow his natural wake up process.
- "When I am stressed out, I cannot fall asleep."

#### **BRANDS**

















#### Bio

Solomon is a data scientist who loves to enjoy life as much as working hard on his career. Unfortunately, his lack of sleep and bad habit of constantly snoozing is hurting his ability to function and be timely. He's used sleep apps before, but even as a data scientist was dumbfounded without relevant context or suggestions to structure his life and enhance his wake hours and overall day. He doesn't want to try and understand an application, but rather wants the application to understand him. He found out that Casper's new sleep app doesn't require a wearable and it even prevents him from easily snoozing, and prompts him with useful actionable suggestions regarding his sleep habits.

#### PERSONALITY

Introvert **Extrovert Creative Analytical Conservative Progressive Passive Active** 

# Technical

**Specifications** 

1. Calendar Integration: Dream Team will pull information from apple, gmail, and other common calendars in order to inform sleep related decisions such as snoozing. https://developers.google.com/google-apps/calendar/

Through the use of sync tokens, there is an oppertunity to take advantage of the incremental sync function to repeatedly feed information to the Dream Team app related the user's calendar events.

- 3. Google Maps/Google Maps Directions Integration:
  - a. https://developers.google.com/maps/
  - b. https://developers.google.com/maps/documentation/directions/
- 4. Motion Detection/Sleep Tracking Modes: the DreamTeam will measure sleep in two ways, namely through the microphone and accelerometer. These modes can be chosen in settings. Research indicates that users are averse to the notion of placing the device near their heads, citing radiation as the main concern. Hence, it is recommended that they are offered the ability to place it on a nearby nightstand. Diverting from the very high fidelity method of measuring sleep, polysomnography, the use of accelerometer and microphone implements actigraphy, a method of sleep measurement composed of one metric, movement. In short actigraphy is a non-intrusive method of measuring sleep.
- a. Microphone Access: Microphone access will be imperative for this mode of sleep tracking as it will need to listen to sounds in order to determine what the sleep stage the is currently in. b. Accelerometer: As an option for those who are not averse to placing a device in their vicinity, the accelerometer serves as a more accurate method of actigraphy.
- 6. iOS 10 notifications: The DreamTeam intends to make use of iOS 10's revamped notification, which emphasizes post-interactivity. In particular, use of widget notifications now available in the lock screen as well as the ability to disable the lock screen for the snooze related functionality.

#### **User Notifications**

iOS 10 introduces the User Notifications framework (UserNotifications.framework), which supports the delivery and handling of local and remote notifications. An app can use the classes of this framework to schedule the delivery of local notifications based on specific conditions, such as time or location. Apps and app extensions can use this framework to receive and potentially modify local and remote notifications when they are delivered to the user's device.

Also introduced in iOS 10, the User Notifications UI framework (UserNotificationsUI.framework)

which lets you customize the appearance of local and remote notifications when they appear on the user's device. This framework can be used to define an app extension that receives the notification data and provides the corresponding visual representation. The extension can also respond to custom actions associated with those notifications.

https://developer.apple.com/library/content/release notes/General/WhatsNewIniOS/Articles/iOS 10.html

Custom Icon Usage in Notification Center: https://images.google.com/imgres?imgurl=http%3A%2F%2Fmedia. idownloadblog.com%2Fwp-content%2Fuploads%2F2016%2F06%2FApple-iOS-10-Lock-Screen-Widgets. png&imgrefurl=http%3A%2F%2Fwww.idownloadblog.com%2F2016%2F06%2F15%2Fios-10-preview-lock-screen%2F&docid=F6GEbqpfEuIqcM&tbnid=1BYl-sj-ZydfNM%3A&w=1600&h=1700&source=sh%2Fx%2Fim

Disabling Idle Timer: Disabling the idle timer will allow Dream Team to present custom gestures to de-activate the snooze.

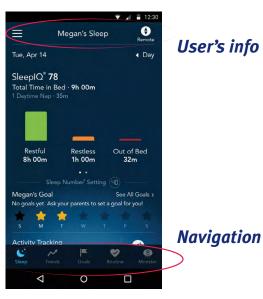
- § UIApplication sharedApplication].idleTimerDisabled = YES;
- § http://stackoverflow.com/questions/9904306/disable-automatic-screen-lock-in-ios-5-1

# **Appendix**

## Sleep IQ - Smart mattress app







Sleep Page



Report

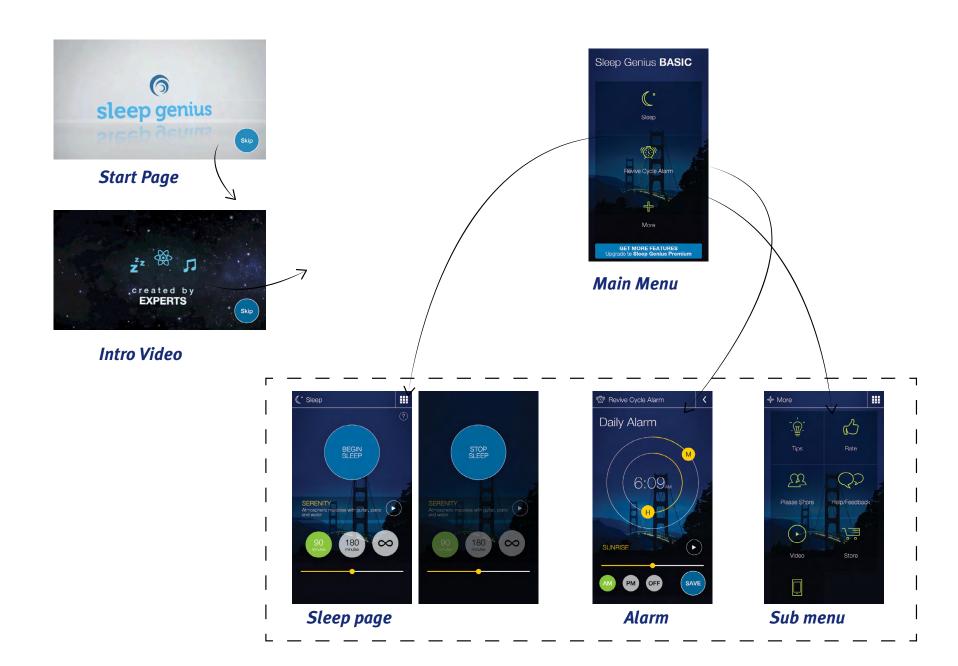






Routine

## Sleep Genius - Sleep app



#### 정 박태 세 38% 🖺 18:17 Digipill - Sleep app Perfect Pitch Break Playlist (0) My Pills (0) T-Break 00:00 13:08 T-Break Prescribed for relaxation Take some time out. Use this pill to embark upon an effortless journey of ever growing comfort towards a state of calm and replenishment. digipill Prescribed for confidence Got an important meeting or presentation? This pill guides you to build self-confidence; to deal with objections eloquently and put your best foot forward. Relief period: 24m 3s 0 Prescription: \$0.99 ※ 성 시합 세월 18:11 Pill Store Take some time out. Use this pill of effortless journey of ever growing column and replenishment. Scroll Down **(** digipill My Pills Perfect Pitch digipill Sleep Deeply Prescribed for confidence Prescribed for a night of rest (0) T-Break ( My ) Sleep Deeply 00:27 Pill cabinet to change your mind. For times when you need a lift, some focus, or to improve your mood. Prescribed for a night of res Relief period: 26m 47s **Increasing Comfort** Prescription: \$0.99 Digital pills on demand Prescribed for wellbeing Trance Tripping Targeted relief for the curious. Prescribed for exploration Discover the psychology behind your pills from their creators. Imagine Recommend Choose a pill to take based on your curren needs or desire and then tap play. Spread the word. Prescribed for creativity Slim to Thin Increasing Comfort Prescribed for motivation Prescribed for wellbeing Information This pill has been prepared to increase your levels of comfort and so promote wellbeing and health. Feel reassured in your life. Man Magnet Prescribed for passion View Introduction Relief period: 24m 17s Main Menu Fear of Flying Terms & Conditions Prescribed for a calm journey Contact Support Mind of a Genius Trance Tripping Prescribed for lateral thinking Introducing Digipill Focus **Sharing** For most of us life is hectic and we could all do with For most of us life is heetic and we could all do with a little high to ease the pressure. Many of us spend much of our time just trying to catch up. Few of us what we are doing and how we are even going to get there. Most of us are trying our best to make it through the day, if there are little when you feel like this, then Digipill will give you a beautiful way to take a breather. Prescribed for concentrat **Trance Tripping** Motivation Prescribed for exploration Prescribed for success Take this pill to allow yourself to explore your mind with a trip deep into your subconscious. Sit back, chill out, and let yourself go... Lifting the Cloud In the time it takes for you to have a cuppa, you can grab yourself a little peace and quiet, a few quality minutes to really relax while you are being expertly guided to restoring yourself to full capacity. Relief period: 39m 44s Purchase more pills from the Pill Store. Peace of Mind The result is that in a little over 10 minutes you can find yourself gathering all the benefits of a delightful ailor-made experience that will set you up for the rest of your day, whether it is the night before your big speech, a time when you need to calm down, or that moment when you need a little extra motivation. Prescribed for easing anxiety

**Information** 

Power Nap Prescribed for refreshmen

Start Page

app. Terms and Conditions

Terms and Conditions
Please read the Digipill terms of use before using the

Lagree, let's go!

Slim to Thin

Prescribed for motivation

Relief period: 23m 45s

This pill is designed to aid you in building that crucial motivation in helping you lose weight or quit a bad habit. Increase your will-power.

## Hello Sense - Sleep tracking device app

