# DOCUMENTATION

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## PLANNING

The planning stage initially started off with heavy brainstorming for ideas in general. We were thinking about what app we can build to satisfy this assignment. However, Chris and I decided to frame this a different way, which resonated with both of us.

We wanted to work on a real problem that was affecting a lot people. A real problem that we think and feel that needs to be solved. As a side note, this really aided us as a team because we both strove towards the same goal, with the same motivations.

We brainstormed such problems, but the one that resonated with us the most was sleep, which we will delve into greater detail in the below 'problem' section.

### Problem

A significant number of people are not getting enough sleep. Sleep is an extremely important process and stage in our lives as it is critical for proper restoration, growth, and development.

Extract from our presentation notes

> "Among Australian adults, 62% of us are either sleep deprived or oversleeping.
> Only 28% get the recommended seven to eight hours of sleep a night.
>
> So what are the effects of this? How does sleep deprivation, or indeed oversleeping, impact your life? Let me tell you the bad news. Studies show, that for the vast majority of people, those who sleep for less than six hours a night were 12 percent more likely to experience a premature death. Conversely, people who slept more than eight to nine hours had an even higher risk, at 30 percent. Along with these, some other devastating effects include:
>
> Side effects
> - Harder time receiving information due to the brain's overworked neurons
> - Different interpretations of events
> - Impaired judgement
> - Impaired ability to access previous information
> - Increased risk of diabetes, heart disease, obesity, sleep apnea"

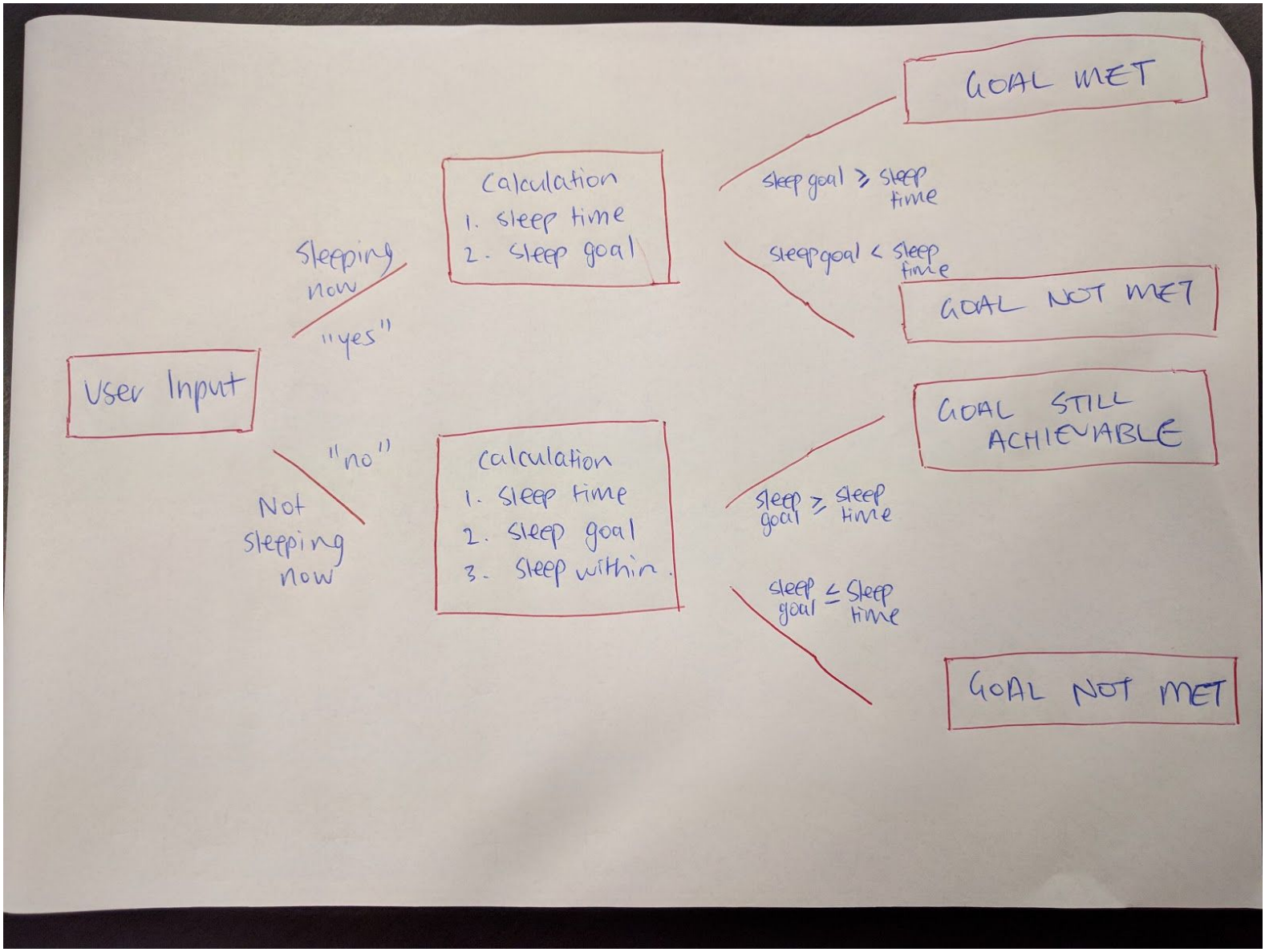
### Idea

Circadian (Version 1.0) is a ruby terminal application that identifies whether or not the user has achieved their sleeping goals (i.e. whether they had achieved “x” hours of sleep every night).

The core functionality that Circadian (v1.0) will solve is determining whether or not a user has met their sleeping goal (i.e. to make sure they are getting at least {sleep goal} hours of sleep per Circadian (v1.0) works as follow:

**DEVELOPMENT OF SOLUTION**

**App structure (flow chart)**



**Output**

Once the app has determined:

1. What option was selected
2. Whether the user has met a goal or not,

It will return a certain output. The outputs will follow this structure:

1. Current time, Wake up time
2. Whether the goal was met or not
3. Reminder of the user's sleep goal
4. Message to the user

**Why did we choose these outputs? (each number directly addresses the previous sections numbered list)**

1. By informing the user of the current time and their wake up time, it provides beneficial context as well as the convenience of showing it to them in the application itself.
2. It is critical to inform the user whether they have met their goal or not. This will help them identify their overall performance. This will also indicate whether they need to take corrective action or continue with their good habits.
3. Being reminded of one's goals are an essential element to continual progression and maintenance of one's habits. This can be particularly beneficial if the user is not continually meeting their goals. By reminding them, it can encourage them to keep it.
4. This is a way for us to communicate to the user. It can be very simple such as "Goodnight!", but also valuable. Please see the below example (number 2). It reminds the user that they have to sleep within a certain time if they want to achieve their goal (note: at this stage they are not sleeping).

**Example 1 (if 'yes' chosen + sleeping goal met)**

```
Good evening,
Will you be going to sleep now? (options: yes, no)
yes
- - - - - - - - - - - - - - - - - - - -
The current time is: 2018-03-02T09:33:31+11:00
Your wake up time is: 2018-03-03T04:00:00+11:00
- - - - - - - - - - - - - - - - - - - -
GOAL MET, GREAT WORK!
- - - - - - - - - - - - - - - - - - - -
You have to wake up in 18.44 hours.
- - - - - - - - - - - - - - - - - - - -
You are meeting your sleep goal of getting at least 8.0 hours of sleep per night.
- - - - - - - - - - - - - - - - - - - -
Goodnight!
- - - - - - - - - - - - - - - - - - - -
```

**Example 2 (if 'no' chosen + sleeping goal not met)**

```
Good evening,
Will you be going to sleep now? (options: yes, no)
no
- - - - - - - - - - - - - - - - - - - -
The current time is: 2018-03-02T09:32:52+11:00
Your wake up time is: 2018-03-03T04:00:00+11:00
- - - - - - - - - - - - - - - - - - - -
SLEEP GOAL STILL ACHIEVABLE
- - - - - - - - - - - - - - - - - - - -
You have to wake up in 18.45 hours.
- - - - - - - - - - - - - - - - - - - -
To meet your sleep goal of getting at least 8.0 hours of sleep per night, please
make sure to sleep within 10.45 hour(s).
- - - - - - - - - - - - - - - - - - - -
```

These outputs will hopefully assist the user in achieving their sleep goals and thus solve the problem of sleep deprivation.

**Development of solution continued + technical issues + areas of improvement**

**Main functionality vs. features**

The biggest hurdle that our team faced was building upon the core functionality of the app, to include “awesome” features. Unfortunately, due to time constraints we could not successfully implement the features.

Circadian was able to successfully run the core functionality. This is version v1.0.

There were two main features we wanted to implement

1. Helpful tips (to hopefully improve the users sleep performance)
2. Progress bar (to display how well the user is meeting their sleeping goals),

We were able to run the code for the said features, however, this was only possible through it being run as its own distinct app. Bugs were also produced at times, which we weren’t able to robustly fix due to the time constraints. It would be for v2.0. As a result, we could not integrate it into the main app (Circadian v1.0) as many errors and bugs kept occurring.

The main issue was integration of those two apps via modules. We could not get the features’s (tips and progress) modules/methods to be called properly, as well as being able to read/write data into a separate file (which could be successfully used for the said modules/methods), in harmony with Circadian v1.0.

Therefore as a compromise we decided to go forward with and launch Circadian v1.0 (i.e. present and submit). However, we decided to keep the code for our features to be added in for future development (i.e. for Circadian v2.0).

Another area of improvement and/or possible cause/contributor of this difficulty could be more communication/collaboration in our work flow. Whilst as a team we were working well, one of us focused more on the core functionality and the other on features. This was intended so we can distribute the workload more, in order to be more efficient. This separation could have lead to a decrease in effectiveness in combining our code. Specifically, if we updated/communicated more frequently, it may have lead to a better results.

Note: we have included version 2.0’s code as a inner directory within our main application’s folder. This is so they worked separately, but you can see how the both work.

**Modules**

All of our modules were working well and efficient. However, there is one module that we believe we could improve on: strings.rb. This module contains most of the strings used in our app. Relative to the rest of the module it does contain more lines of code.

One way we could improve this would be to store strings into arrays and/or hashes. Unfortunately, we could not do this due to time constraints, but we have scheduled this for v2.0.

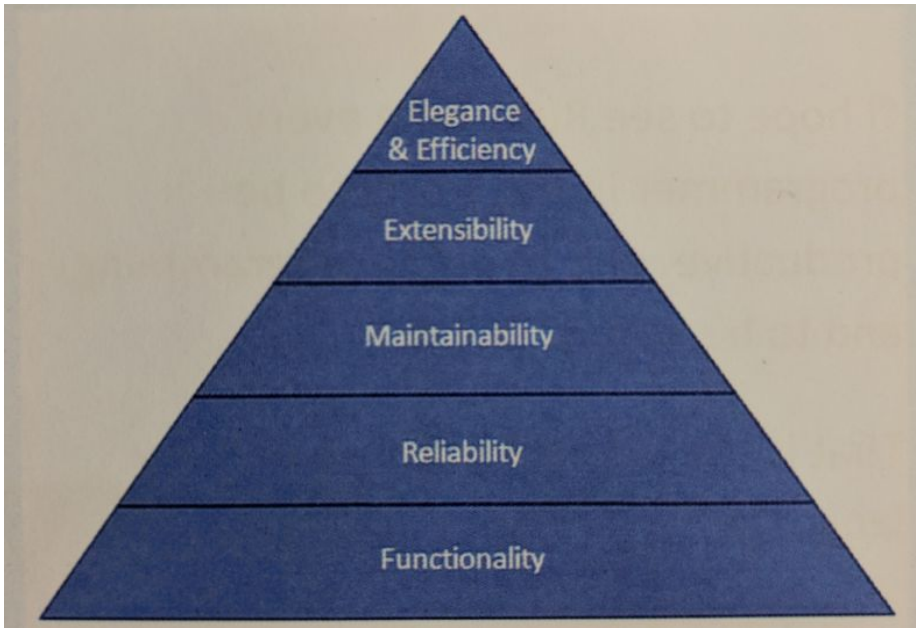
**Further features that we have not coded yet**
Circadian (v1.0) and the features in v2.0 are great for assisting the user to get enough sleep. However, it does not provide the resources or safety nets to prevent them from oversleeping.

An alarm can be a feature, but also a maximum hours of sleep per night too (e.g. if the sleep goal is 8 hours per night, sleeping 16 hours does satisfy the goal, but oversleeping also causes problems).

**Calculations module**
One specific area in the calculations module that was causing much trouble was successfully working out the time difference between WAKE_UP_TIME and CURRENT_TIME. The method to calculate the difference worked fine (gem: Time_difference) and finding out the CURRENT_TIME was fine too. However, finding out the WAKE_UP_TIME was causing problems. Initially we just hardcoded the values just to test out our app.

The next step was to check ruby documentations and the gem documentations. After many trials and errors, we eventually found the solution in ruby documentation (as well as searching through stackoverflow).

**OTHER**




Our overall strategy when working on this application was to write, build, and edit code following this hierarchy. This was especially helpful during the big problems we faced with the core functionality (v1.0) and features (v2.0).

Another tactic that was very helpful was just writing out our code first in pseudo code. By fully understanding and working out what the application is meant to do, it is much easier and efficient to write effective code.

**PRESENTATION**

Presentation notes are available if needed.

Presentation resources are available here:

- Notes
- Slides