

**Bachelor Project**



**Czech  
Technical  
University  
in Prague**

**F3**

**Faculty of Electrical Engineering  
Department of Computer Science**

## **Implementation of a mood tracker application**

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## I. OSOBNÍ A STUDIJNÍ ÚDAJE

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## II. ÚDAJE K BAKALÁŘSKÉ PRÁCI

Název bakalářské práce:

**Vytvoření aplikace pro sledování nálady**

Název bakalářské práce anglicky:

**Implementation of a mood tracker application**

Pokyny pro vypracování:

Prozkoumejte oblast lidského chování a nálady. Navrhněte, a minimálně v první verzi realizujte aplikaci, která uživatelům se sledováním a zlepšováním nálady pomůže. Postupujte následovně:

- 1) Definujte pojem nálada a lidské chování. Analyzujte typické situace, které se v této oblasti nejčastěji řeší.
- 2) Prozkoumejte, zda pro tuto oblast existují podpůrné aplikace a proveďte jejich vyhodnocení. Zaměřte se na jednoduchost používání a přínosnost aplikace.
- 3) Své závěry ověřte formou průzkumu v rámci některé z existujících skupin (například na sociálních sítích), které se vybranou problematikou zabývají.
- 4) Na základě výstupů analýzy a průzkumu definujte požadavky na aplikaci, která bude jednoduchá a odpovídající nejčastějším požadavkům na zlepšování nálady.
- 5) Pomocí nástrojů softwarového inženýrství vytvořte návrh této aplikace.
- 6) Navrženou aplikaci realizujte minimálně v první verzi.
- 7) Použitelnost ověřte formou uživatelských testů na skupině uživatelů, kteří se účastnili průzkumu.

Seznam doporučené literatury:

1. Jamie M Marshall, Debra A Dunstan, Warren Bartik, Effectiveness of Using Mental Health Mobile Apps as Digital Antidepressants for Reducing Anxiety and Depression: Protocol for a Multiple Baseline Across-Individuals Design, JMIR Research Protocols, Ongoing trials, grant proposals, and methods, 2020, online: [www.ncbi.nlm.nih.gov/pmc/articles/PMC7381081/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC7381081/)
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### III. PŘEVZETÍ ZADÁNÍ

Studentka bere na vědomí, že je povinna vypracovat bakalářskou práci samostatně, bez cizí pomoci, s výjimkou poskytnutých konzultací.  
Seznam použité literatury, jiných pramenů a jmen konzultantů je třeba uvést v bakalářské práci.

\_\_\_\_\_  
Datum převzetí zadání

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## Declaration

Prohlašuji, že jsem předloženou práci vypracovala samostatně a že jsem uvedla veškeré použité informační zdroje v souladu s Metodickým pokynem o dodržování etických principů při přípravě vysokoškolských závěrečných prací.

V Praze, 14. srpna 2022

## Abstract

This thesis investigates and compares mood tracking applications available on the market. The research is then used as a basis for the design of a mood tracking application, which focuses on monitoring users moods over time and providing them with corresponding data to help find any negative mental health patterns. Finally, the mobile application is implemented and then evaluated in a week-long testing period.

**Keywords:** mood, tracking, application, kotlin, depression

**Supervisor:** Ing. Pavel Náplava, Ph.D.

## Abstrakt

Tato práce zkoumá a porovnává aplikace pro sledování nálady dostupné na trhu. Z výzkumu pak vychází návrh aplikace pro sledování nálady, která se zaměřuje na sledování nálad uživatelů v průběhu času a poskytuje jim odpovídající údaje, které pomáhají najít případné negativní vzorce duševního zdraví. Nakonec je mobilní aplikace implementována a následně vyhodnocena v týdenním testovacím období.

**Klíčová slova:** nálada, sledování, aplikace, kotlin, deprese

**Překlad názvu:** Vytvoření aplikace pro sledování nálady

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# Chapter 1

## Introduction

The WHO has defined mental health as "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." [1]

Not only can stress affect our day-to-day lives, it may also lead to various mental health disorders like depression and even increase our risk to develop other diseases such as cardiovascular disease and diabetes. [2]

It comes as no surprise that as the stigma around mental health gradually fades and technology continues to advance, more and more apps aimed at monitoring mood over time arise. These apps range from simple mood trackers to complex applications analyzing a multitude of external factors, such as diet, lifestyle, sleep schedule, etc.

These applications are often used in combination with other mental health resources, such as therapy or medication, and are not a substitute for professional help. They can, however, help a person monitor their progress or lack thereof. Furthermore, understanding how and when mood shifts happen could help a person identify important patterns in their behavior, which can then be properly addressed.



### 1.1 Mood

The conception of mood in cognitive psychology is derived from the analysis of emotion. Mood is considered as a group of persisting feelings associated with evaluative and cognitive states which influence all the future evaluations, feelings and actions. [7]



### 1.2 Mood disorders

Mood disorders interfere with one's ability to function. One's emotional state or mood can be distorted or inconsistent with their circumstances in life. [4]

### ■ 1.2.1 Depression

Major depressive disorder is a mood disorder that makes someone feel constant sadness or lack of interest in life. It may come as a side effect to other mental health disorders, which makes it one of the most common mood disorders. It can cause the affected person to suffer greatly and function poorly at work, at school and in the family. At its worst, depression can lead to suicide.

WHO estimates that it affects 3.8% of population, including 5.0% among adults and 5.7% among adults older than 60 years. That's approximately 280 million people in the world.[6]

Common symptoms include:

- feelings of sadness, irritability and emptiness,
- loss of pleasure or interest in activities,
- poor concentration,
- hopelessness about the future,
- changes in appetite,

and more. Now these symptoms can also be present in other mental health disorders, but are usually followed by symptoms specific for that particular disorder (e.g. episodes of mania for bipolar disorder).

### ■ 1.2.2 Anhedonia

A common symptom of depression (and other mental health disorders like schizophrenia and bipolar disorder) is anhedonia, which is the inability to feel pleasure.[3] It makes a lot of tasks hard to accomplish, as there is no motivation and no reward of enjoyment.

## ■ 1.3 Mood tracking

Mood tracking is used as a tool to monitor one's mood over time. It exists in various forms such as daily journals and mood charts. The base concept is to select a mood (or multiple moods, symptoms, etc.) every day.

As mentioned above, mood tracking can help a person identify behavioral patterns, triggers that cause mood changes, develop coping techniques and overall better understand their mental health. When working with a professional, this data can be used to determine if treatment is helping.

Studies have shown that mood tracker apps can be useful for reducing thoughts of self-harm in adolescents.[5]



There are many mood tracking apps already available for multitude of mental health disorders. This thesis is focused on designing an application specifically for people with depression and anhedonia.

Even though mood tracking is a powerful tool, it needs to be consistent over a period of time. Of course, the longer the period, the better. However, anhedonia makes it harder for people to manage even the simplest everyday tasks, so opening an app every day just for the sake of mood tracking might seem pointless to people with depression.

The goal is to design an app that fights this problem by giving users personalised motivation to open the app and fill in their mood. The main focus is to build the habit of mood tracking first and foremost without overwhelming the user with a plethora of functions.





## Chapter 2

### Survey

As a part of this thesis, a brief survey was sent to a group of 17 people aged 20 to 26 and 1 psychiatrist, 18 participants in total. The aim of this survey was to get information about the awareness of mood tracking apps among respondents. In addition, there were questions about their mental health and the apps they had tried (if any). Some questions were about preferences regarding the appearance of the app. Lastly, respondents could submit their name and express their interest in future testing.

Not all questions got responses or were in any way beneficial to this thesis, so below is a summary of the important data.

The survey was created with Google Forms and sent out via various social media.



### 2.1 Mood tracking and mental health awareness

The aim of these questions was to find out how many people had ever tried a mood tracker and, if so, which one.

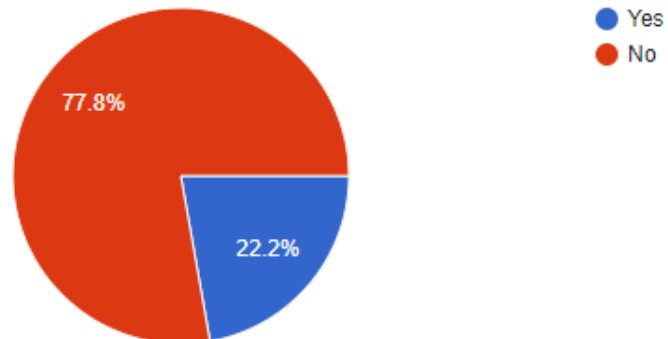


#### 2.1.1 Have you ever used a mood tracker?

Unsurprisingly, 14 out of 18 respondents chose "No" as their answer. Those who had tried some forms of mood tracking could either not even remember the name of the app, or used a different form of mood tracking such as journaling or writing notes on paper.

## Have you ever used a mood tracker?

18 responses



**Figure 2.1:** Have you ever used a mood tracker?

### ■ Why haven't you tried any?

When asked further, 30% of them admitted that they had never even heard of such an app. 70% responded that they were too lazy to use them regularly.

### ■ Are you still using a mood tracker?

50% of respondents who selected "Yes" in the first question responded that they don't use any mood trackers anymore, the other 50% responded that they only use it sometimes.

### ■ Would you like to try mood tracking?

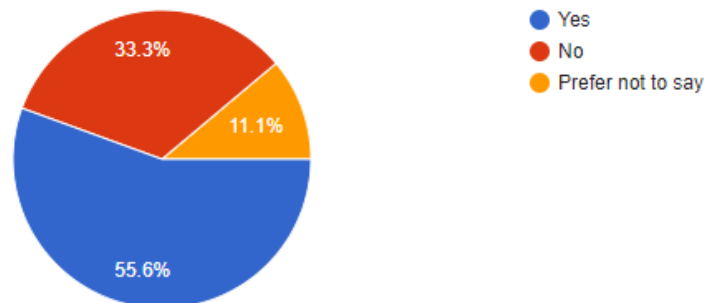
Only 1 person out of 14 selected "No" as their answer to this question. The majority of respondents showed interest in mood tracking and 5 of them agreed to take part in testing the first version of the application.

### ■ 2.1.2 Do you have any mental health issues?

55% of respondents admitted to having some mental health issues. Those who were willing to share chose depression to be the most common with anxiety close second.

Do you have any mental health issues?

18 responses



**Figure 2.2:** Do you have any mental health issues?

## 2.2 App related questions

These questions were aimed at the look and price of the application.

### 2.2.1 Do you prefer dark mode or light mode?

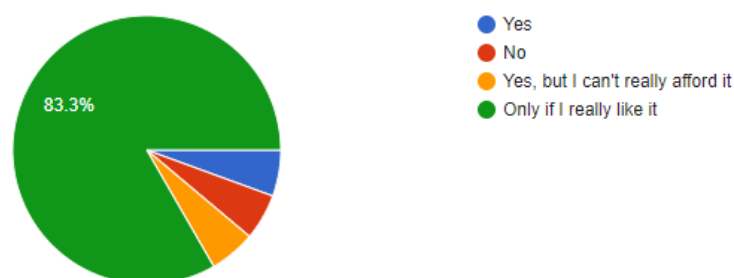
61% of respondents selected dark mode as their preference and 28% of respondents didn't care. This answer influenced the design of the app.

### 2.2.2 Are you willing to pay for an app?

83% of respondents answered that they would be willing to pay for an app only if they really liked it, otherwise no.

Are you willing to pay for an app?

18 responses



**Figure 2.3:** Are you willing to pay for an app?

### ■ 2.2.3 Could it boost your mood to see photos from the good days?

100% of respondents agreed that seeing pictures from when they felt good might boost their mood.

### ■ 2.2.4 Do you like memes?

Again, 100% of respondents chose "Yes" as their answer to this question.

## ■ 2.3 Survey conclusion

This survey has shown that despite little awareness of mood trackers, there is great interest in trying them out. People who did want to try them (or tried and stopped using them) found themselves too lazy. Depression often makes people feel that they are lazy and makes repetitive tasks boring. That's why the idea of adding something fun, personalised and interesting to combat these feelings and motivate the user to open the app is important.



## Chapter 3

### Analysis of existing solutions

There are many mood trackers available in the Android Play store. This analysis compares the four most popular among them and identifies the most important features of these applications.

#### 3.1 Application selection

First, a search for applications was conducted using following keywords:

- mood,
- tracker,
- depression.

Chosen apps needed to have mood tracking as their primary focus and be in English. There were hundreds of apps in the search results, so the 4 with the best ratings with over 100,000 downloads were selected.

#### 3.2 Daylio

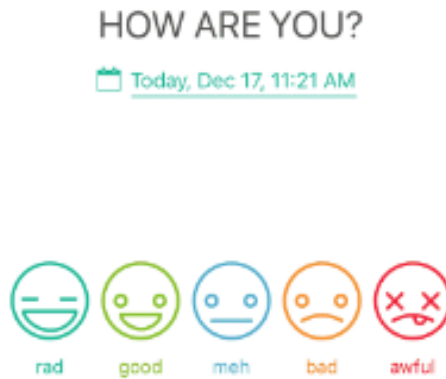
Daylio is the most popular mood tracker on the market right now. It has over 10 million downloads and 4.7/5 stars on Google Play.[20]

The free version of this app contains all of the core functions, but the user can pay \$2.99/month to unlock premium features such as extra icons and emojis, advanced statistics, automatic backups etc.

The idea is to create daily entries that consist of:

- mood,
- activities,
- notes.

Mood selection is done with a simple five button scale ranging from "rad" to "awful" mood. The user can pick from dozens of various activities to add to their daily entry like hobbies, lifestyle, health, fitness, chores etc.



**Figure 3.1:** An example of Daylio mood selection screen.

The app then stores the data, displays them in list or calendar views and creates charts based on the entries. Not only does it show the count of different moods, it provides advanced data to show how different moods correlate with different activities.

It also allows the user to set goals for activities such as eating healthy for a set amount of days.

### ■ 3.3 Moodflow

Moodflow is another popular mood tracker with over 100 thousand downloads and 4.9/5 stars rating on Google Play.[21]

The user fills out a quick survey every day with:

- day rating (mood),
- emotions,
- notes,
- activities.

Day rating (mood selection) is done on a scale from 1 to 5 and the user can similarly to Daylio pick from numerous activities and hobbies.

The app displays stored data in calendar view and analyses relationships between activities, moods and emotions.

It also allows the user to create routines and keep track of them and help build new habits.

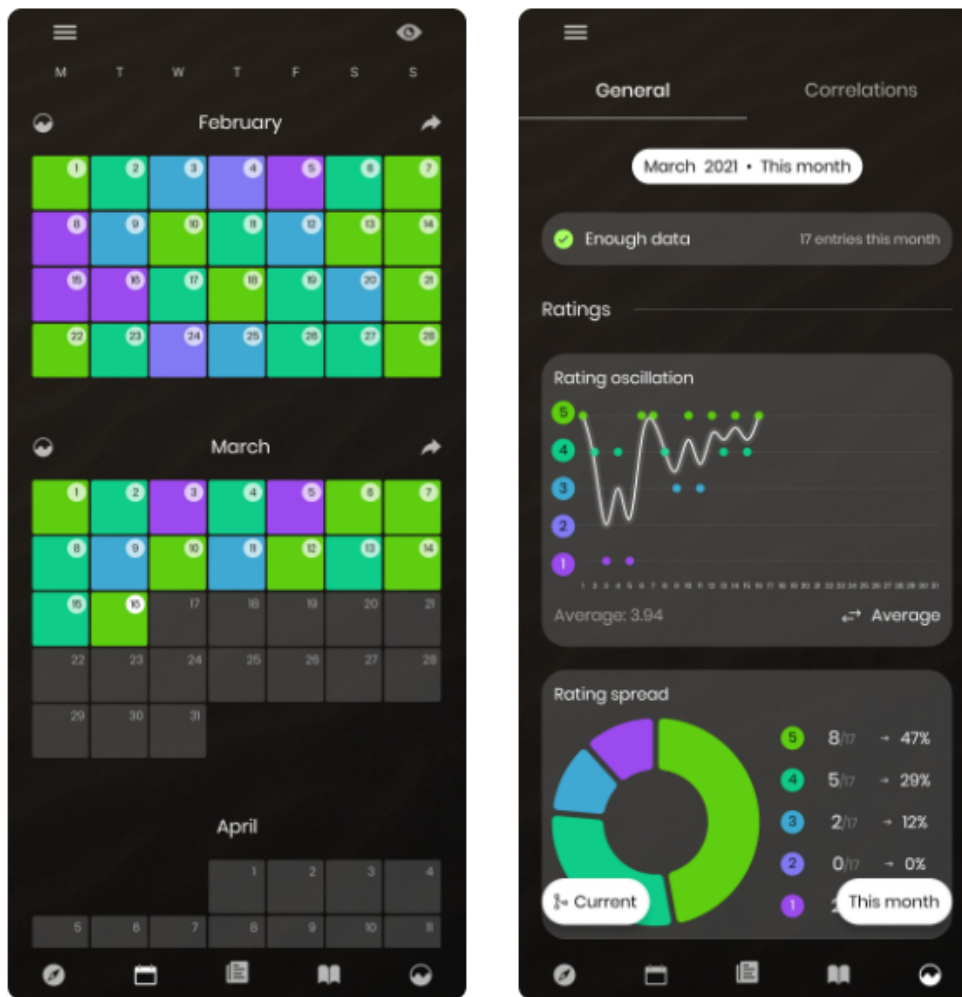


Figure 3.2: An example of Moodflows calendar view and ratings.

### 3.4 DailyBean: Simplest Journal

DailyBean is a mood tracker with over 1 million downloads and 4.4/5 stars rating on Google Play.[22]

It allows the user to track:

- mood,
- activities,
- notes.

Mood selection is also done on a five button scale. There are also colorful icons for activities.

The data is stored, processed and analyzed in a way that allows the user to see what activities affect their mood.

### 3.5 Mood Tracker Self-Care balance

Mood Tracker Self-Care balance is a self-care pet app with over 100 thousand downloads and a rating of 4.8/5 stars on Google Play.[23]

The app supports the tracking of:

- mood,
- activities,
- notes.

Mood tracking is done with a five button scale. The motivation for the user is having a "self-care pet" - a virtual penguin that you take care of by completing habits and getting rid of anxiety and depression.

As with the previous apps, it processes and displays the data in calendar view or in a form of reports and meters.

### 3.6 Analysis conclusion

All of the most popular apps use the five button mood scale. The apps also provide the option to track data such as emotions, habits, symptoms, activities etc. Motivation is done mostly by creating goals and having streaks (for example mood tracking for a set amount of days). This can be motivating to some, but might also have the opposite effect - not logging for one day destroys the streak and the user has to start all over again, which can be very demotivating, especially for people with anhedonia who will most definitely miss a lot of days.

Having so many options for tracking, customizing and displaying data might be overwhelming for people with anhedonia, especially as the survey showed low awareness of what mood tracking even is. The users would have to learn not only how to track mood, but to identify symptoms, habits and thought processes.

The conclusion is to focus on building the habit of mood tracking first and foremost. Other features can be added in future versions if deemed necessary.

## Chapter 4

### Application design

This chapter covers the design of the application and its functionalities.

The difference between this app and other mood trackers is the idea of making the app personal to the user. While some apps might use streaks, motivational quotes, advice and other things that might enhance the users mood, this app will leave it to the user to create content for themselves.

#### 4.1 Mood selection flow

The core of this app will be the mood selection. Based on previous analysis, mood selection will be done with a five button scale, since it seems to be the most popular form of mood measurement. This five item mood scale was also used in some studies that measured self-rated mental health (SRMH).[19]

There will be five mood buttons to choose from:

- Great
- Good
- Okay
- Bad
- Terrible

When the user selects moods from Great to Okay, they will be prompted to take a photo or upload a photo from gallery. This is what makes the app personal to the user. One of these photos will be then randomly shown to the user when they select Bad or Terrible mood.

#### 4.2 Functional requirements

Functional requirements define system behavior, features and functions and were established according to previous survey and research.

- **FR1** The application will allow the user to select and save moods.

- **FR2** The application will allow the user to take/upload a photo and memory after selecting okay/good/great mood.
- **FR3** The application will allow the user to view moods and memories on particular days.
- **FR4** The application will allow the user to view new memes from r/wholesomememes subreddit.
- **FR5** The application will allow the user to schedule daily notification.
- **FR6** The application will allow the user to change their username.
- **FR7** The application will display a random photo from the database after selecting bad/terrible mood.
- **FR8** The application will display a random meme on the dashboard.

### ■ 4.3 Non-functional requirements

Non-functional requirements describe how the application should behave, such as usability, reliability and performance.

- **NR1** The application will be in English.
- **NR2** The application will run on smartphones with Android version 5.0 (API level 21) and newer.
- **NR3** The application will follow design rules from Material Design.[14]

### ■ 4.4 Use cases

In Figure 4.4 you can see a use-case diagram which provides a high-level overview of the application. It describes what the system does and how the actors use it. Each use case is described below.

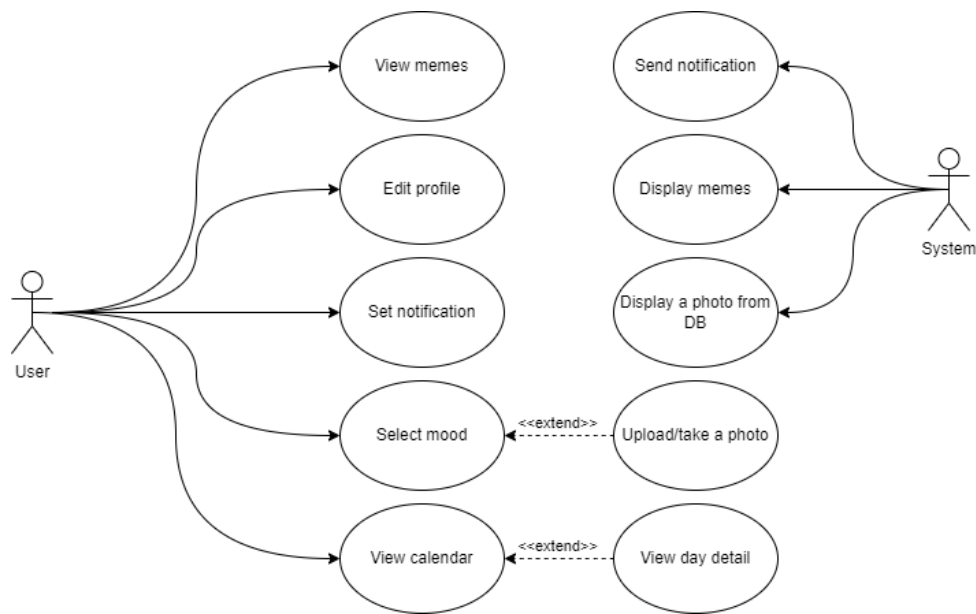


Figure 4.1: Use-case diagram.

#### 4.4.1 Select mood

This use case allows the user to select their mood.

**Main scenario:** Selecting positive mood

1. The user clicks on one of the three rightmost buttons on the dashboard (Okay, Good, Great).
2. The app displays a screen with options to load/capture a picture. These optional use cases are covered in 4.4.6.
3. The user finishes the upload.
4. The app displays a screen with a textfield to write down notes about the day.
5. The user can fill in some text and clicks continue.
6. The app displays the dashboard.

**Alternative scenario:** Selecting negative mood

1. The user clicks on one of the 2 leftmost buttons on the dashboard (Bad, Terrible).

#### 4.4.2 View calendar

This use case allows the user to view the calendar with selected mood for each day.

**Main scenario:**

1. The user clicks on the calendar tab in the bottom navigation.
2. The app displays the calendar with the current day selected.
3. The user selects any day from the calendar.
4. The app displays the date and mood for the selected day (if one was selected).

#### ■ 4.4.3 View memes

This use case allows the user to view newest memes from the r/whole-somememes subreddit.

**Main scenario:**

1. The user clicks on the meme tab in the bottom navigation.
2. The app displays the meme page with a list of memes.
3. The user swipes left or right on a meme.
4. The app removes the meme from the list.

#### ■ 4.4.4 Edit profile

This use case allows the user to edit their username.

**Main scenario:**

1. The user clicks on the profile button.
2. The app displays the profile page with a username textfield.
3. The user writes their name in the textfield and clicks Save.
4. The app saves the username (which is then shown on the dashboard).

#### ■ 4.4.5 Set notification

This use case allows the user to turn on/off and select time for the daily notification.

**Main scenario:**

1. The user clicks the notification switch in the profile.
2. The app turns the notification on/off.
3. The user clicks on the notification name.
4. The app displays a time picker.
5. The user selects time and clicks Ok.
6. The app changes notification time to selected time.



#### 4.4.6 Upload/take a photo

This use case allows the user to upload or take a picture.

**Main scenario:** Take a picture

1. On the photo upload screen, the user clicks on Capture picture.
2. The app turns on the camera.
3. The user takes a photo.
4. The app saves the photo to gallery and links the photo with the selected mood.

**Alternative scenario:** Upload a picture from gallery

1. On the photo upload screen, the user clicks on Load picture.
2. The app opens gallery.
3. The user selects a photo from gallery.
4. The app links the photo with the selected mood.

#### 4.4.7 View day detail

This use case allows the user to view day detail for specific days.

### Main scenario:

1. The user clicks on any day in the calendar and clicks Show detail.
2. The app displays a screen with the date, selected mood, memory and photo.

## 4.5 GUI and wireframes

This section describes the GUI design with wireframes to show the overall idea. The aim is to make the app feel a bit like it's on paper. Wireframes were created using Figma.[8]

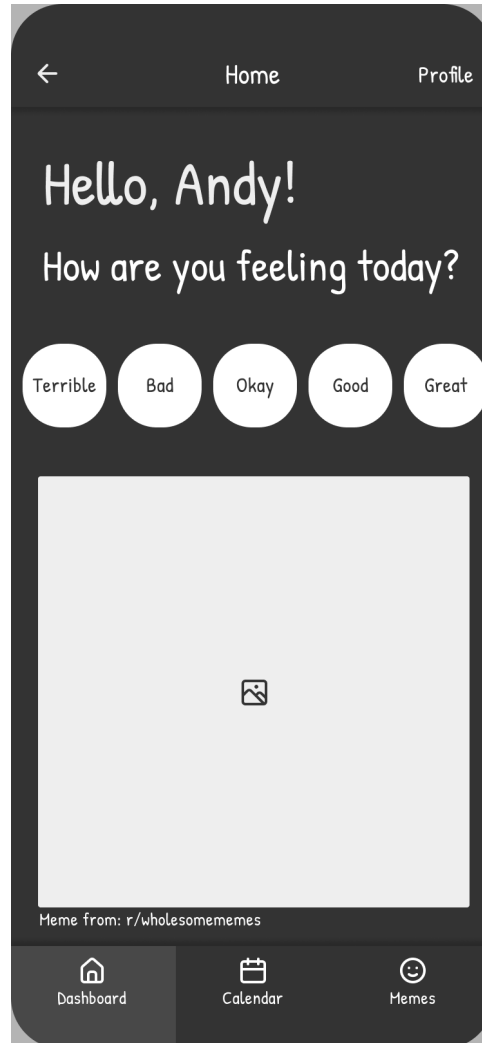
The app consists of 4 main parts:

- Dashboard
- Calendar
- Memes
- Profile

The user can navigate between parts of the app using bottom navigation and profile button.

### 4.5.1 Dashboard

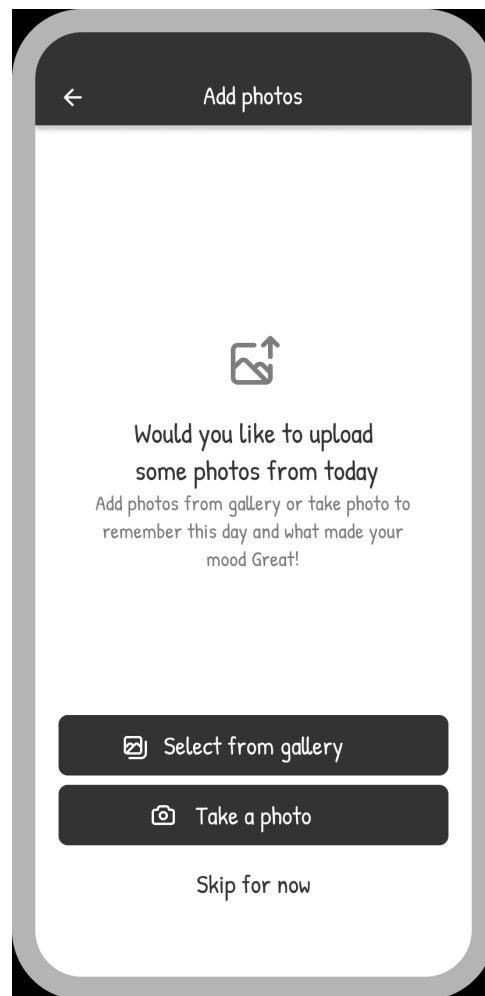
The dashboard is the first thing the user sees after opening the application. There are 5 mood buttons to choose from and daily meme displayed.



**Figure 4.2:** The dashboard with options to select mood.

### 4.5.2 Add photos

After selecting positive mood, the user is prompted to upload a picture.



**Figure 4.3:** This screen prompts the user to load or capture a photo.

### ■ 4.5.3 Add memory

Finally, the user is able to write down some notes (memories) from that particular day.



**Figure 4.4:** This screen allows the user to write down a memory.

## Chapter 5

### Implementation

This chapter describes the implementation of the application, in which the first version was implemented. This version covers all use cases and fulfils all functional requirements.

The implementation builds on a mobile applications course at CTU FEE where several technologies mentioned below were taught. The output from this course was used as the basis of the app and helped to properly design the structure of the project.

The application is developed for Android OS. It was chosen due to its popularity, use of Kotlin programming language and Android Studio IDE. The Android Studio build system is based on Gradle.

#### 5.1 Kotlin

Kotlin was chosen due to its growth in popularity in the last few years. Android development will also be increasingly Kotlin-first.[9]

Some pros of Kotlin include:

- safer coding features,
- expressiveness,
- interoperability (Java-based code can be called from Kotlin and vice versa)

#### 5.2 MVVM

MVVM architecture is an architecture that removes tight coupling between components. In this architecture, we have three main components:

1. Model - holds the data and contains business logic. Usually consists of model classes and local or/and remote datasources.
2. View - UI code. Sends user interaction to the ViewModel and subscribes to the ViewModel to get the data.

3. ViewModel - Bridge between the Model and View. It doesn't have any reference to Views that are using it (in contrast to MVP, where Presenter has one). As a result there is less coupling between the View and ViewModel.

This architecture can be implemented in two ways on the Android OS. First option is to use the DataBinding library that is released by Google (used in this thesis). Another option is using another library, for example RxJava, which provides reactive streams and observables.

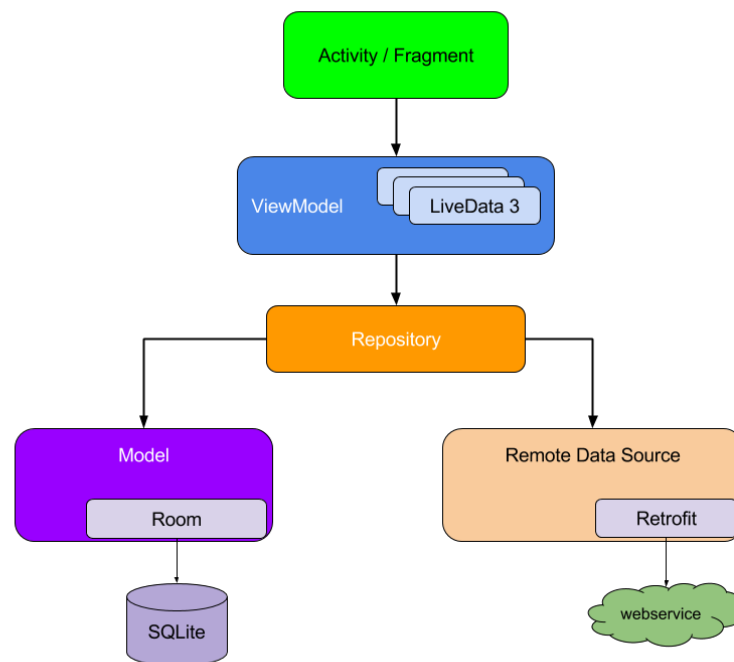


Figure 5.1: MVVM architecture.[10]

## 5.3 Libraries and modules

This section describes the libraries and modules used.

### 5.3.1 Android KTX

Android KTX[13] is a set of Kotlin extensions.

This app uses SharedPreferences from Android KTX to store key-value data like:

- username,
- notification time.

### ■ 5.3.2 CameraX library

CameraX[15] is a library used for capturing and saving photos. It was built to help make camera development easier and was recommended for new apps.

### ■ 5.3.3 Room

Room[12] is an SQLite based object mapping library.

This app utilizes it to save and retrieve:

- mood,
- memory,
- date,
- photo URI.

The memory, photo URI and date are saved with the mood as is shown here:

```
@Entity
data class Mood(
    @ColumnInfo(name = "mood") val mood: String?,
    @ColumnInfo(name = "moodDate") val moodDate: String?,
    @ColumnInfo(name = "memory") val memory: String?,
    @ColumnInfo(name = "photoUri") val photoUri: String?,
    @PrimaryKey(autoGenerate = true) val uid: Int = 0
)
```

### ■ 5.3.4 Retrofit

Retrofit[17] turns HTTP API into a Java interface. It is used to call the Reddit API to fetch posts from the r/wholesomememes subreddit.

### ■ 5.3.5 Moshi

Moshi[18] is a JSON library that makes it easy to parse JSON into Kotlin classes. It is used to parse the JSON representation of posts that is fetched from the Reddit API into collection of Kotlin objects.

### ■ 5.3.6 Jackson

The memes are mapped from JSON to objects with Jackson library[24].

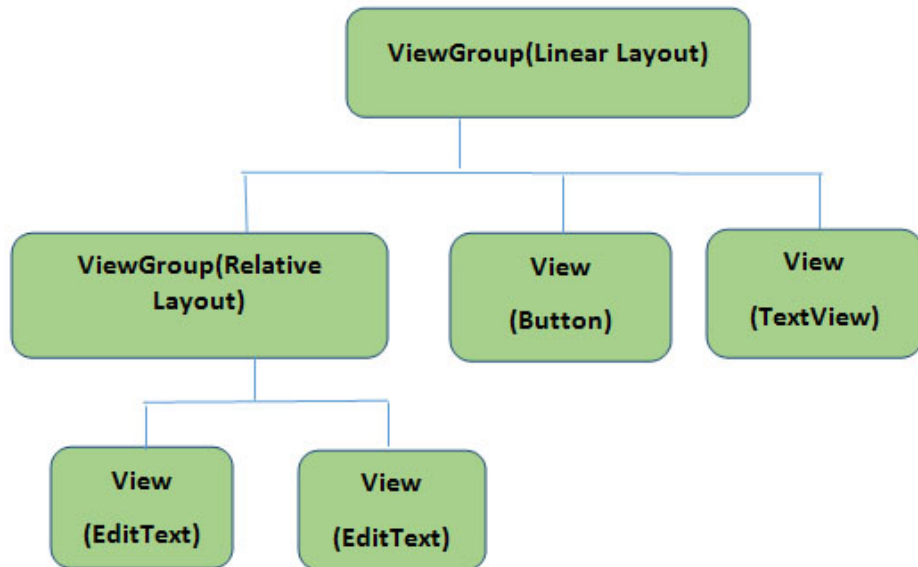
### ■ 5.3.7 Glide

Glide[25] is an open source media management and image loading framework. It is used to fetch images from the urls.

## 5.4 XML

XML is a markup language used to describe data. In this app it is utilised for designing layouts.

The basic concept of Android UI is defined using the hierarchy of View and ViewGroup objects. A ViewGroup is an invisible container that organises child views. An example of this hierarchy is seen in 5.2.



**Figure 5.2:** An example of the View and ViewGroup objects.[16]

## 5.5 GUI

Below are some screenshots from the implemented GUI.



### 5.5.1 Dashboard



**Figure 5.3:** Implemented dashboard with mood selection buttons.

### 5.5.2 Calendar view

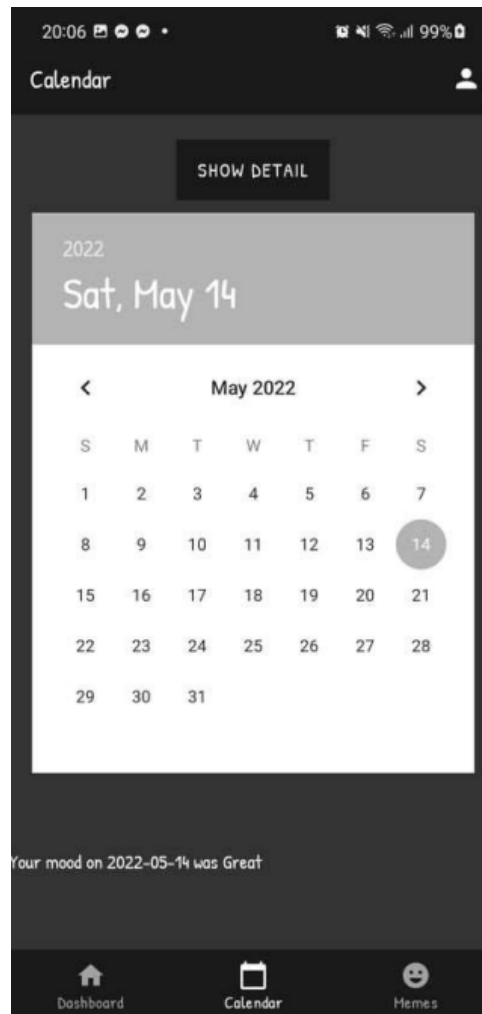


Figure 5.4: Implemented calendar view.

## Chapter 6

### Testing

This chapter describes the user testing and its results. A group of five people received the first version of the app, test cases to test the core functionality of the app and finally instructions to use the app daily for a week. Then they answered questions regarding their experience and were able to provide general feedback aswell.

#### 6.1 Test cases

Below is a list of test cases that were used to test mood selection flow and calendar view with day detail. These test cases were used to detect bugs in the application and show participants how the core functions work.

##### 6.1.1 TC1: Mood selection flow

Test steps and expected results:

Steps	Expected results
1. Choose a good mood from the dashboard.	Photo upload screen appears.
2. Select capture picture option.	Camera is turned on.
3. Take a photo.	The photo is saved, a screen with taken photo and textfield for notes appears.
4. Write down some notes and continue.	The dashboard appears.
5. Choose a bad mood from the dashboard.	One of uploaded pictures appears below mood buttons.

**Table 6.1:** TC1 steps and expected results.

##### 6.1.2 TC2: Calendar view and day detail

Test steps and expected results:

Steps	Expected results
1. Go to Calendar.	Calendar view appears.
2. Select a non-empty day (with mood saved).	Data about selected day appears below the calendar.
3. Click on Show detail.	A screen with date, uploaded photo, mood and memory appears.

**Table 6.2:** TC2 steps and expected results.

## 6.2 Asked questions

After a week-long testing period, participants answered following YES or NO questions:

- Q1: Was the app intuitive to use?
- Q2: Did you like the GUI?
- Q3: Did the personalised mood selection flow motivate you to log your mood?
- Q4: Did the memes motivate you to open the app?
- Q5: Did it improve your mood to see the photos you uploaded?

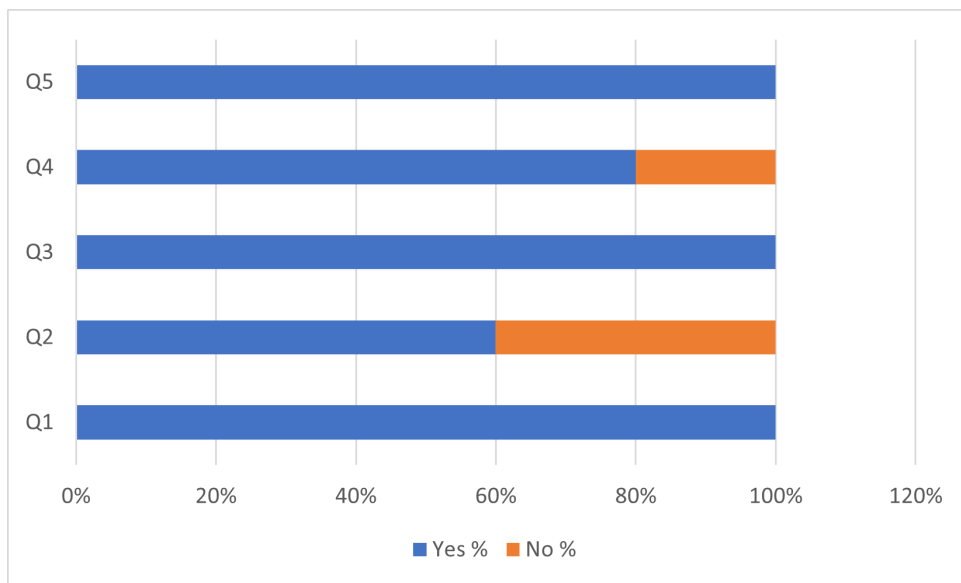
After that, participants got an option to provide general feedback and recommendations.

## 6.3 Testing results

The participants found several issues while testing:

- The notification sometimes went off on different times than selected.
- When having dark theme on, the calendar and mood buttons were invisible.

As is seen in Figure 6.1, all of the participants found the app intuitive to use and were motivated to log their mood daily due to the personalised mood selection flow. All of the participants also reported mood improvements after seeing the photos they uploaded to the app. Only 60% of participants liked the GUI and 80% of participants found the memes interesting enough to open the app.




**Figure 6.1:** Answers to YES or NO questions from 6.2.

Participants provided following feedback and recommendations:

- Mood buttons could be color coded.
- There could be info about mood tracking inside the app.
- There could be some mental health resources linked.
- There could be an option to retroactively change the mood.
- The memes are fun, but there could be more sources of different content as well.

These recommendations could be implemented in future versions as is mentioned in chapter 8.





## Chapter 7

### Conclusion

The goal of this thesis was to design a mobile mood tracking application that focuses on being personal to each user and then implement the first version of this application. The whole idea of personalisation was that on good days, the user would create their own content (a picture) to make them feel better on bad days.

First, a survey was sent to a group of 18 people. This survey helped to establish awareness of mood trackers and subsequently verify that personalising the app could help users with revisiting the app and selecting moods daily.

Then, four popular mood trackers were analyzed. This analysis helped to clarify the main features on which the most used mood trackers are built.

The application design used the information from the previous steps and included functional and non-functional requirements, use cases and wireframes. The core features were mood tracking with a five button mood scale, mood selection flow (take a photo on good days, display photo on bad days), a calendar view with data from previous days, a meme page and simple profile page with daily notification.

The first version of the application was implemented for Android in Kotlin and satisfied all of the functional and non-functional requirements and use cases.

At last, a week-long testing phase helped detect some bugs that were unfortunately not fixed in this version. The participants also provided valuable feedback to help improve possible future versions and confirmed that making their own content helped motivate them to open the app and boosted their mood on bad days.

Overall, the application accomplished its goal and is a solid building block to expand on in the future.







## Chapter 8

### Future development

As this thesis included the implementation of only the first version of the application, there is great potential for adding more functionality to compete with other applications on the market.

Some of possible features to add are:

- statistics,
- custom notifications,
- activity/emotion selection,
- different source of memes.

Of course, a big part of future development would be to fix all the issues found in testing phase and implement some of the suggestions received.





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## Appendix A

### Acronyms

API	Application Programming Interface
CTU	Czech Technical University
FEE	Faculty of Electrical Engineering
GUI	Graphical User Interface
HTTP	Hypertext Transfer Protocol
IDE	Integrated Development Environment
JSON	JavaScript Object Notation
MVP	Model View Presenter
MVVM	Model-View-ViewModel
OS	Operating system
SRMH	Self-rated Mental Health
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
WHO	World Health Organisation
XML	Extensible Markup Language





## Appendix B

### Attachments

Name	Content description
survey.xlsx	Data from survey in chapter 2.
mood-tracker.apk	APK file to install the app.
source.zip	A zipped folder with the apps source code.

**Table B.1:** Content description of attachments.