Where did the time go?

John Viaud, Bilal Abdulmajid, Vitali Surmach

Professor Jia Yanxia

Introduction

Study shows that most people spend a full quarter of their active hours on their mobile device, limiting productivity and potentially taking a toll on their health.

Our Android application is able to track and visualize device usage to help users understand how much they use their devices.

- By focusing on intuitive UI/UX, users can be presented with lots of data without being overwhelmed
- Data is both easy to find and easy to understand.
- We also try to personalize the data by projecting the user's goals over the data we are collecting

Motivation

- Track device time usage
- Setting and keeping track of goals for device usage
- Improve the functionalities of Screen Time(iphone) and Digital Wellbeing (Android)

Related Work

Screen Time

- Confusing Navigation
- Overwhelming amounts of information on one page

Digital Wellbeing

- **Not existing until Nov. 2019. (works for versions after Android Pie or Android 10.**
  - **Ours work for version 8 and up.**
- Dated UI
  - Not following material design guideline
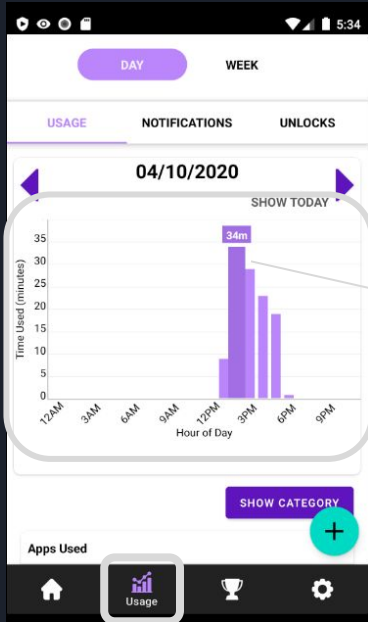- Overwhelming amounts of information on one page
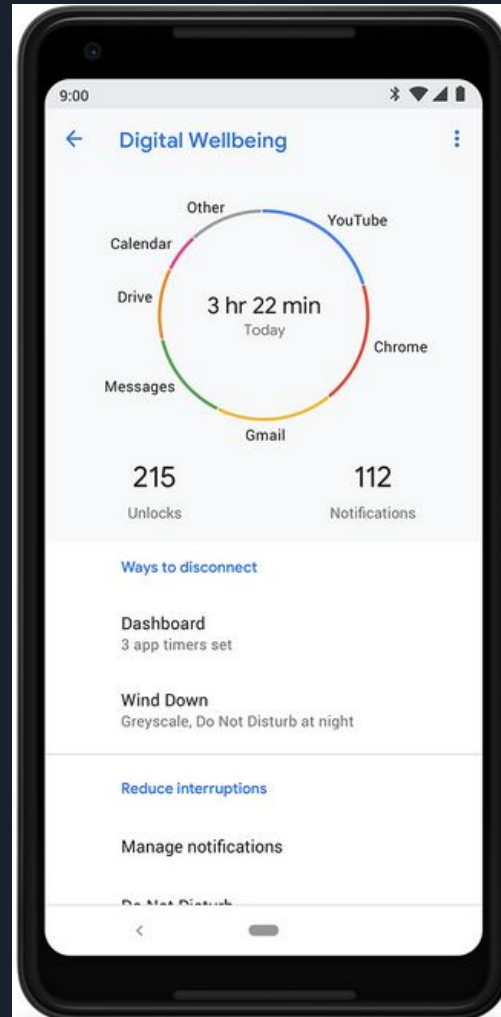
Demo

Usage Daily/Weekly

Using HelloCharts, we pull in the days information from SQL database, and graph it.

Shows the fragments for Usage, Notifications, and Unlock daily/weekly tabs.

Allows to navigate 28 days back graphing each day from 12am to 12pm or from Sunday to Saturday for weekly charts.

Clicking on a specific bar displays all the time and the apps you have used for that hour or day, including the exact time for each app.
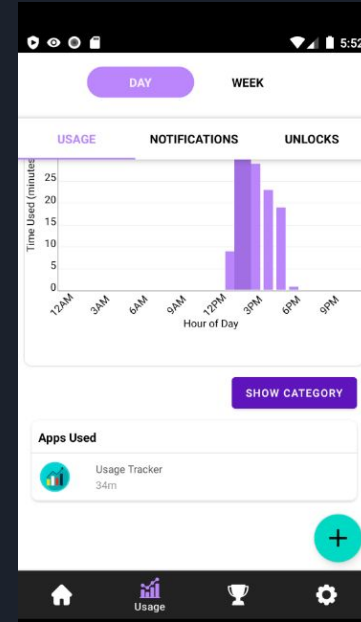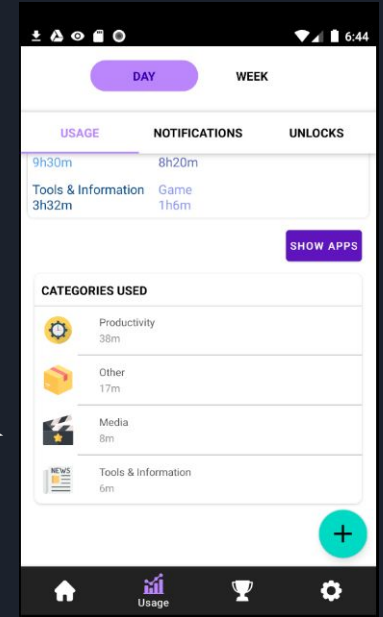
Usage Categories

- Tools & Information
- Social & Communication
- Media
- Game
- Productivity
- Other
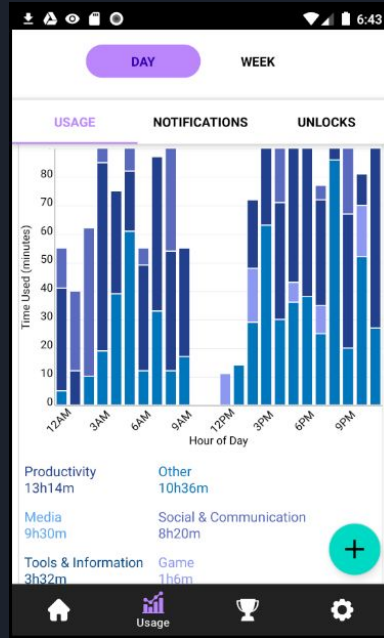
It will also generate a new used list, instead of apps it displays categories used during that day or hour.

Clicking on categories will display a graph with bars for each category in that hour or day.

Settings

- General
  - Applications
    - Select which apps to track
  - Dark mode
- Parental Control
  - Phone limit
    - Set a time limit to the overall usage of the phone
  - App limit
    - Set a time limit on apps
  - Wifi
- Advanced
  - Export to CSV
    - View a usage report of specified data
  - Permissions
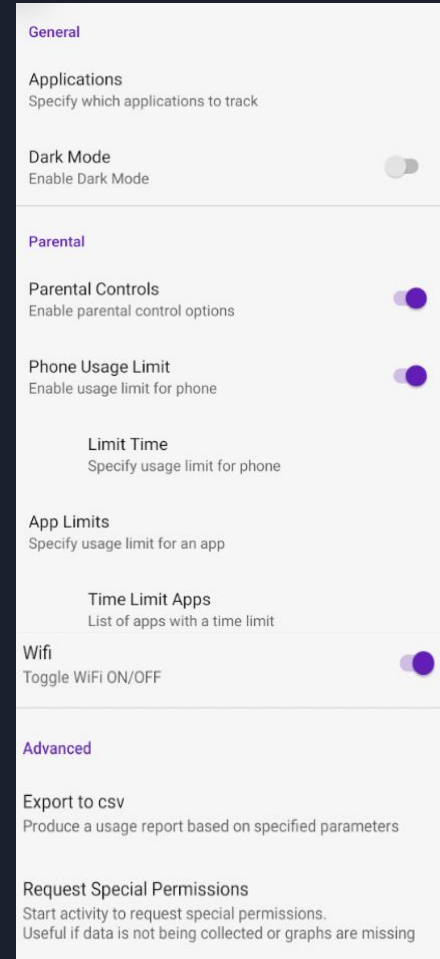
System Architecture

Foreground

Background

Database

Polling

Service
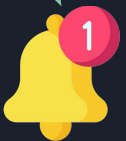
- **Visualization**
- **Goals**
- **Settings**
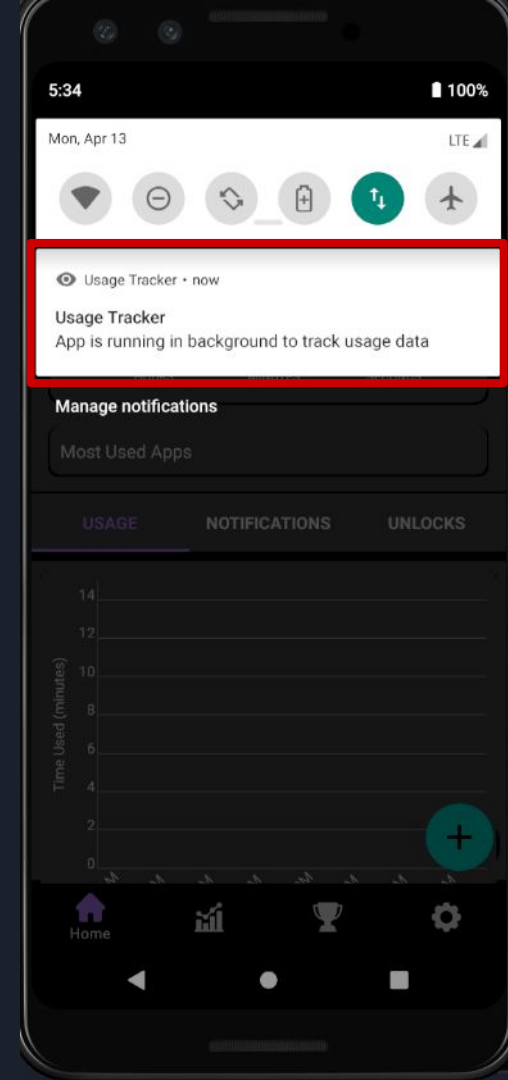
Usage

Unlocks/Locks

Notifications

System Architecture cont. (Background Service)

- Application runs in background indefinitely or until force closed

  - Track Usage, Locks

  - Track Limit

  - Transparency

System Architecture cont. (Polling)

- Usage Stat Manager
  - Built into Android OS
  - Returns usage statistics in a neat HashMap when given a time interval
  - Doesn't work as intended
- Polling
  - Usage
    - Regularly poll usage from UsageStatManager and calculate usage for each app.
  - Track Limit
  - First App Used

Algorithms & Architecture cont. (Database)

- SQLite
  - Database Objects (Classes)
    - Usage Table
    - Goal Table
    - Dynamic queries
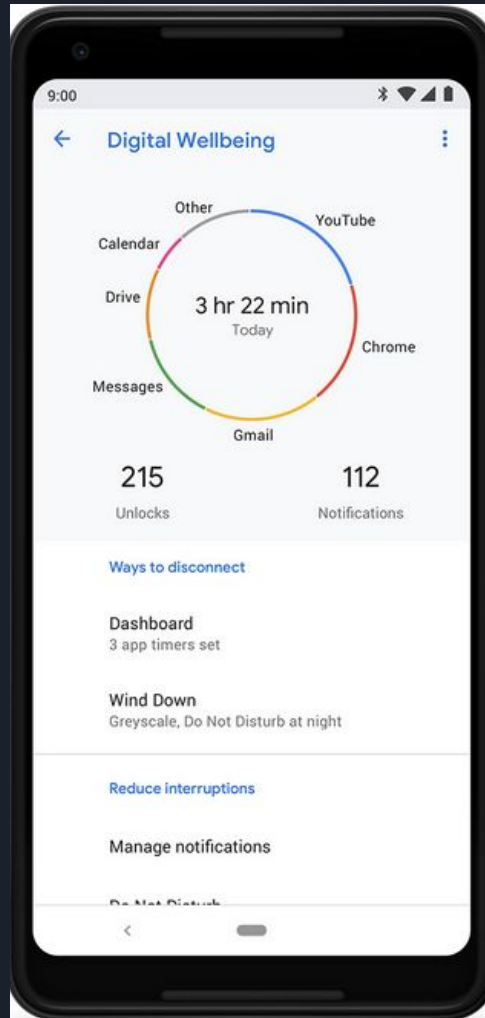- Data Retention
  - Saved locally
  - Clean old data

INSERT

QUERY

UPDATE

DELETE
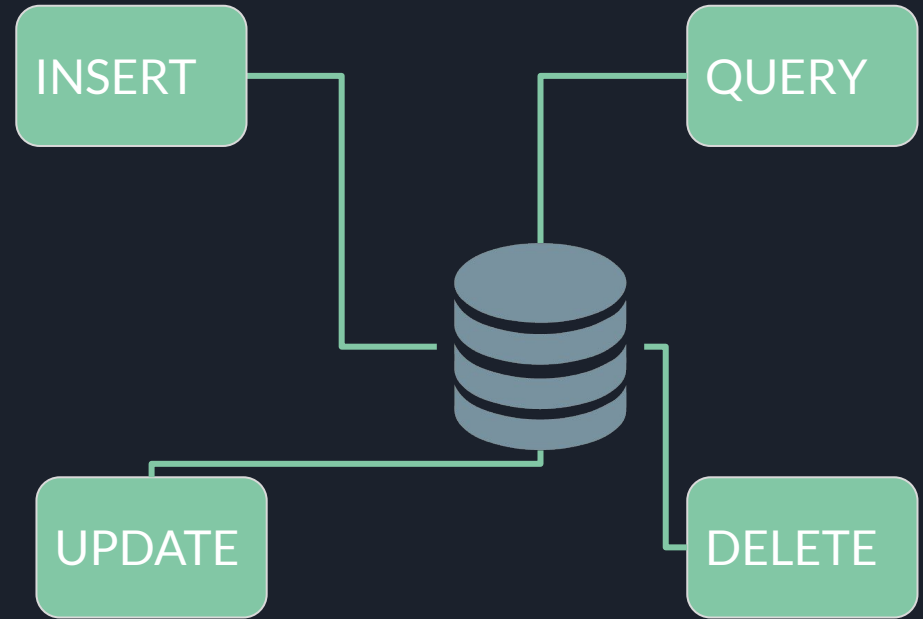
UI/UX

Screen Time

- Overwhelming amounts of information on one page

Digital Wellbeing

- Dated UI
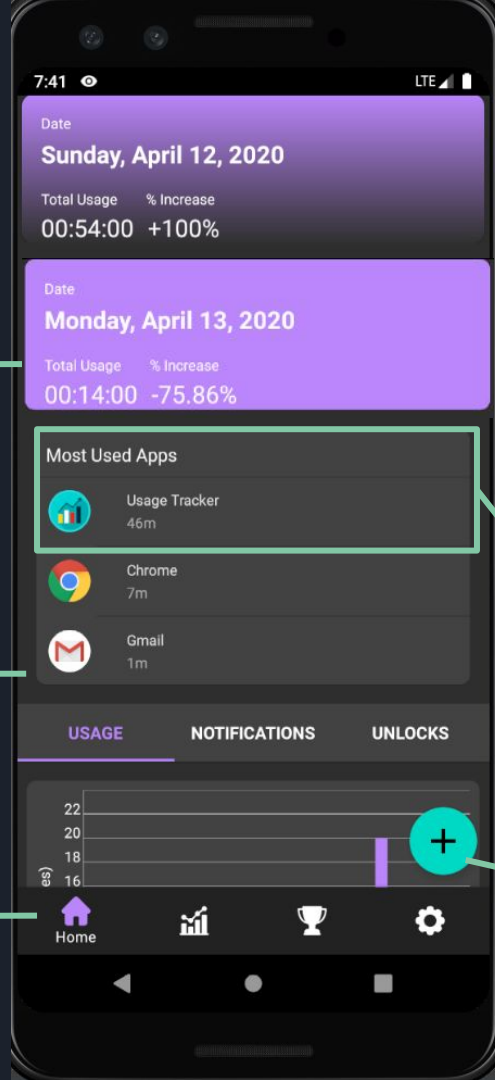- Principles of Material design not reflected.

UI/UX cont.
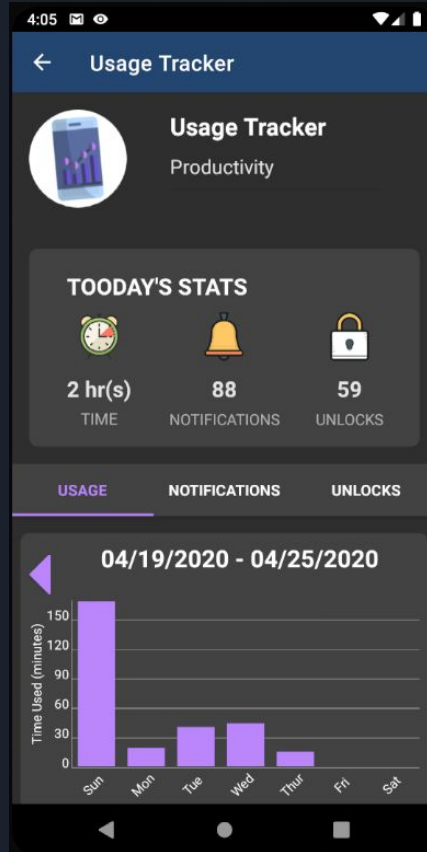(Material Design Guidelines)

Gradient

Elevation

Primary Color

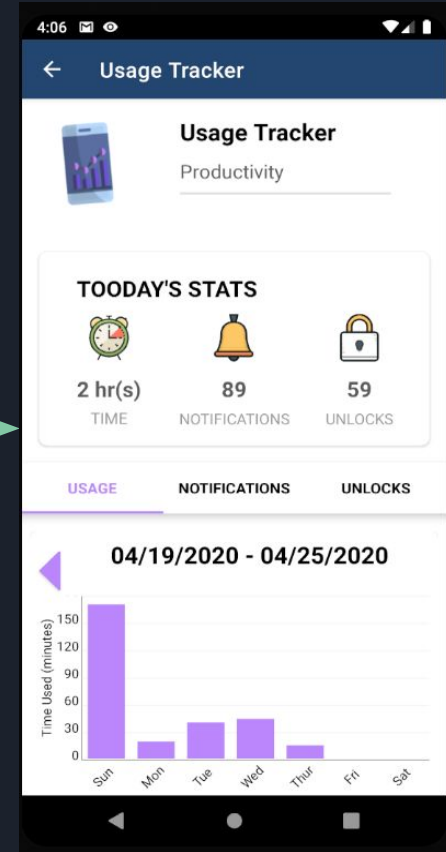Headings/Subheading

Secondary

UI/UX cont.
(Material Design Guidelines)

Color Theme stays consistent

Increase / Decrease Contrast

Challenges

- Making sure our data integrates well with our graphs.
- Some API levels would not function properly.
- Getting permissions to collect usage statistics.
- Letting the background services pass the information in the background.
- Getting the usage stat manager to work.

Future Work

- Improve the polling and storing of data.
- Increase the accuracy in the data.
- Give more control of the data and apps you want to track.

Questions?

References

1. https://www.really.sg/articles/7-time-management-tips-that-will-increase-your-productivity/
2. Icons: https://www.flaticon.com/