Eco-Trans

C22-PS328

Bangkit Product-based
Capstone Project

Our Team

C22-PS328

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Mobile Development

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What is Eco-Trans

Eco-Trans is an application that can **calculate** how much **carbon emissions** are saved on your trip. Your accumulated saved carbon emission will be converted to coins and later can be exchanged to various interesting vouchers. Eco-trans also delivers forecasting weather related such as **temperature, UV-Radiation and AQI.**

Why we build Eco-Trans

- More than 25% of the greenhouse gas emission is formed from the transportation sector.
- There are only 19% people in Jakarta who use public transportation (2019)
- High AQI levels increase the risk of disease by more than 50% for heart disease, and stroke.
- Make a social movement to reduce the Temperature and AQI

https://www.climate-transparency.org/new-paper-the-role-of-electric-vehicles-in-decarbonizing-indonesias-road-transport-sector
https://www.cnnindonesia.com/nasional/20190128204510-20-364562/jk-pengguna-transportasi-umum-di-jakarta-hanya-19-persen

Existing Solution

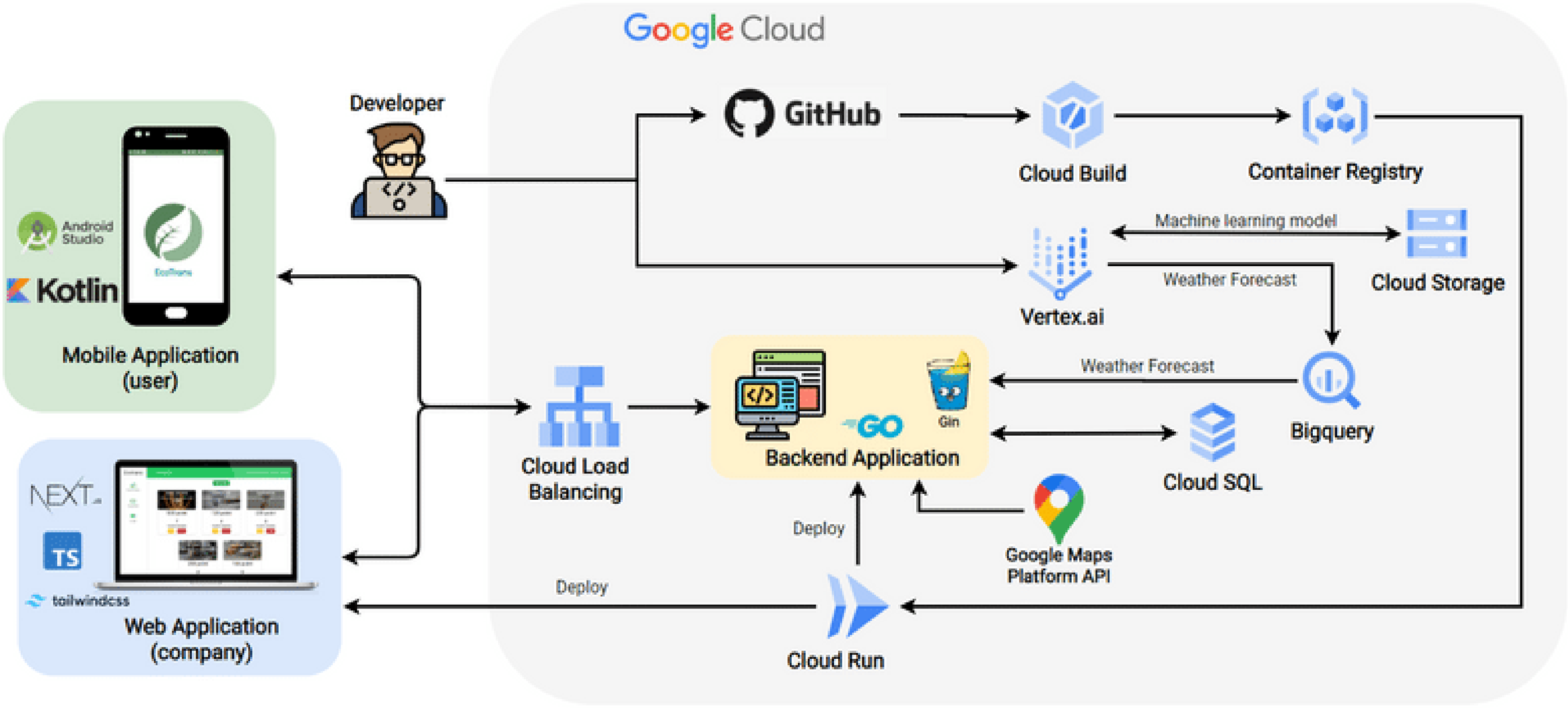
A blockchain-based platform in Portugal which rewards communities for not emitting CO2 by creating and enabling voluntary local carbon markets in which green digital credits circulate as 'eco-tokens'.

What are missing?

- No similar platform or app in Indonesia
- Don't give air quality and weather information (to increase user awareness about the impact of using public transport)
- Don't have maps feature to suggest routes

Implementation

Cloud Architecture and Tech Stacks



Time-Series Forecasting with Stacked LSTM

Our models generate hourly forecast of these variables:

- Air Quality Index
- Tempe-rature
- UV Index

Datasets:

- Beijing Multi-Site Air-Quality Dataset 2016-2017 *(used due to lack of Jakarta's hourly air-quality dataset)*
- Temperature dataset from Jakarta in 2019
- Jakarta UV index dataset from Ambee Data

Pipeline

- Collecting Data
- Perform data Cleaning
- Data Modeling
- Model Deployment

Utilized services:

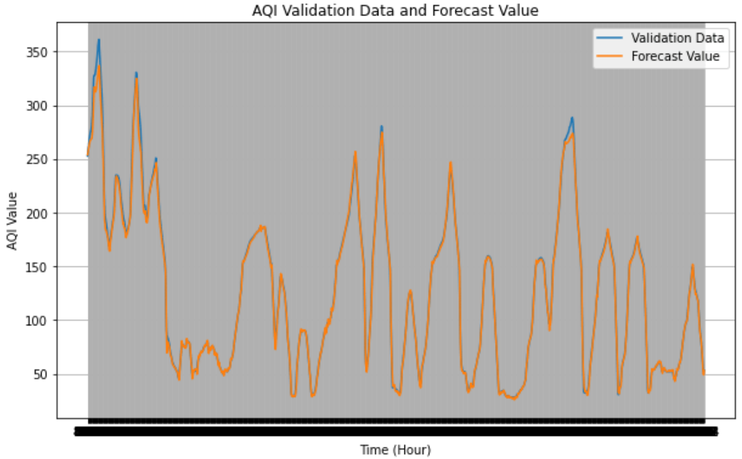
Vertex AI

Google BigQuery

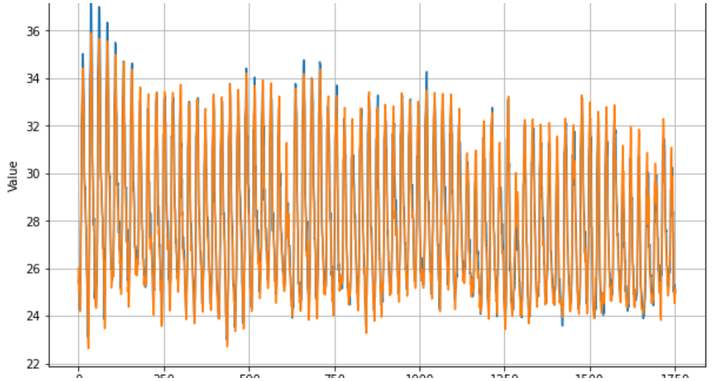
Google Cloud Storage

The Results of Time-Series Forecasting

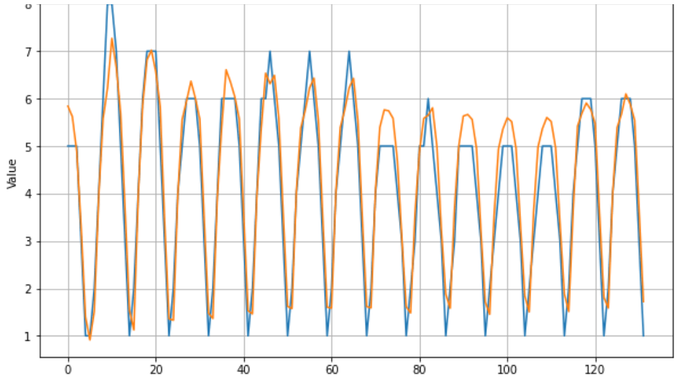
Air Quality Index



Tempe-rature



UV Index



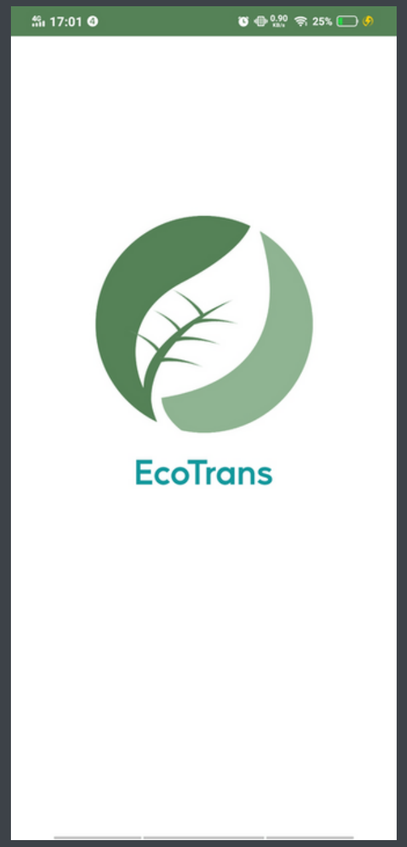
Mean Absolute Error (MAE)

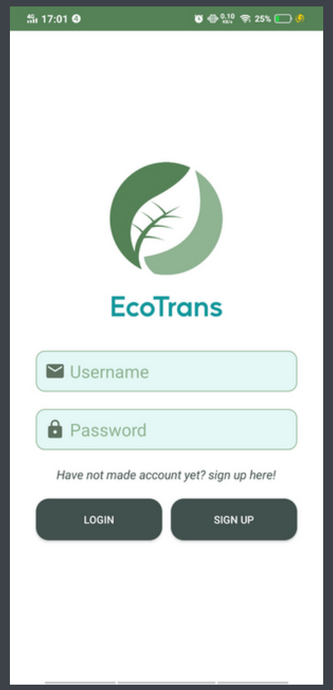
2.470957

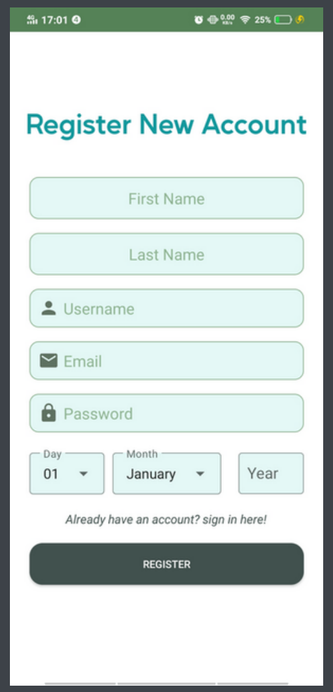
0.639276

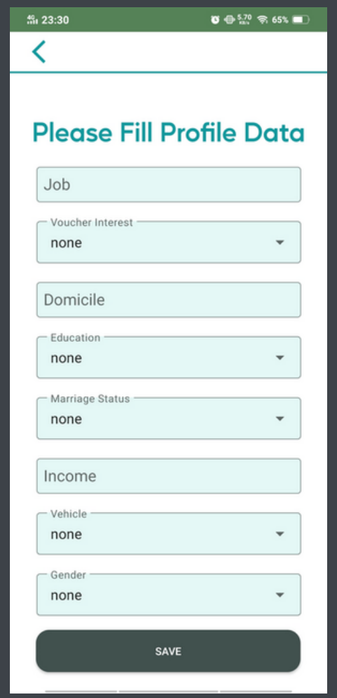
0.4844505

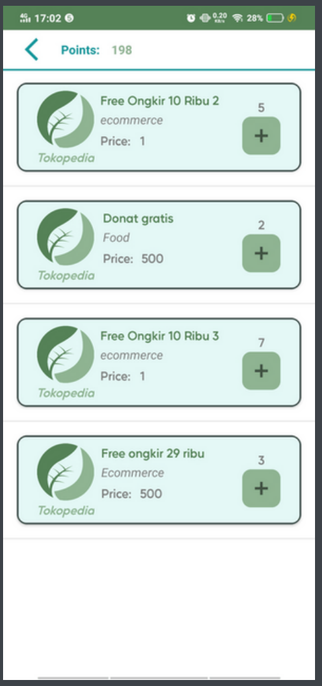
EcoTrans Mobile App Design

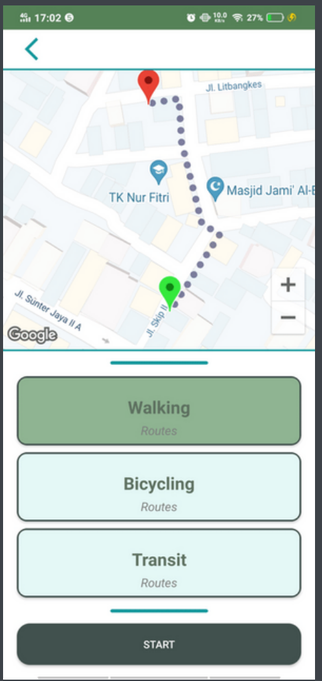


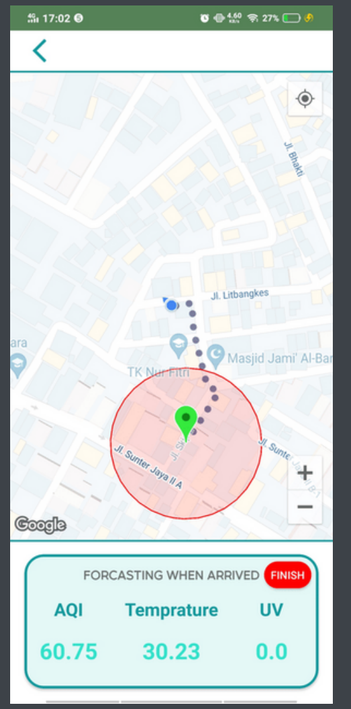


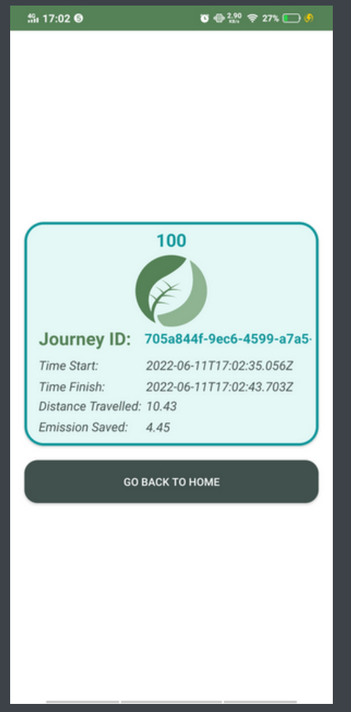




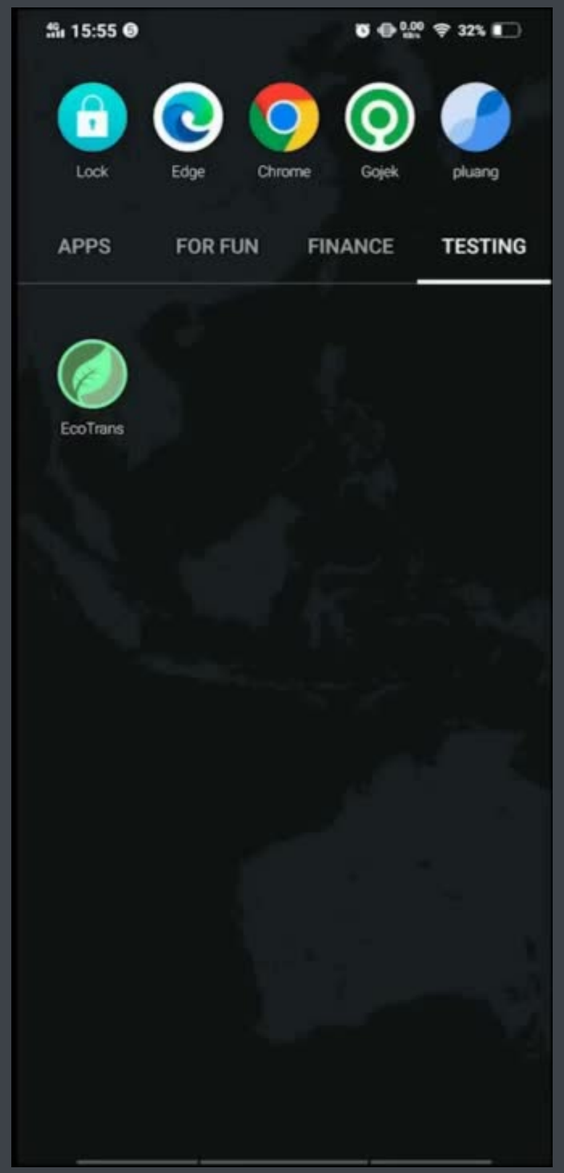




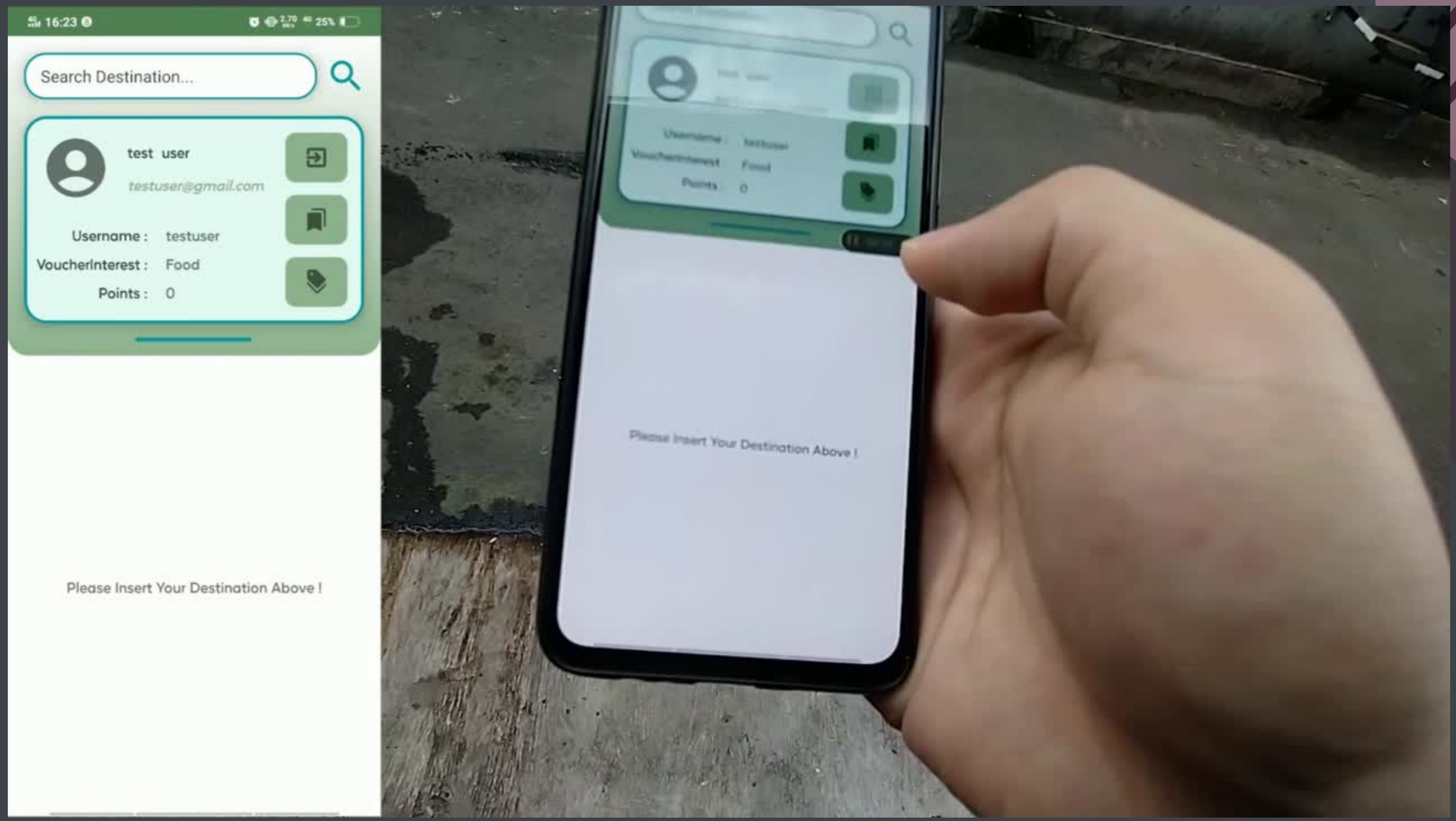




Android Application Demonstration

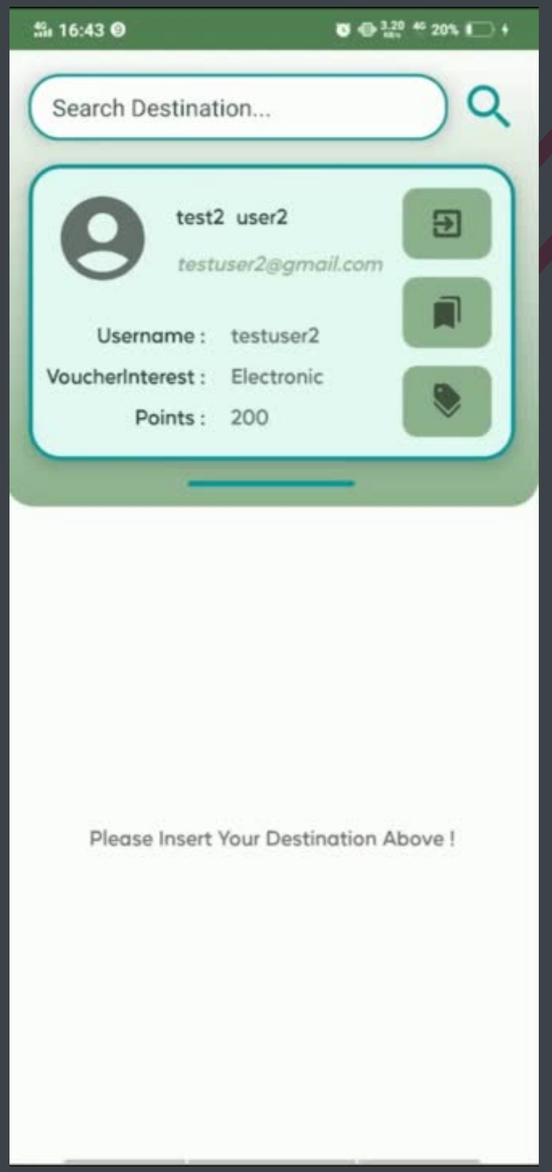


Register account & user login

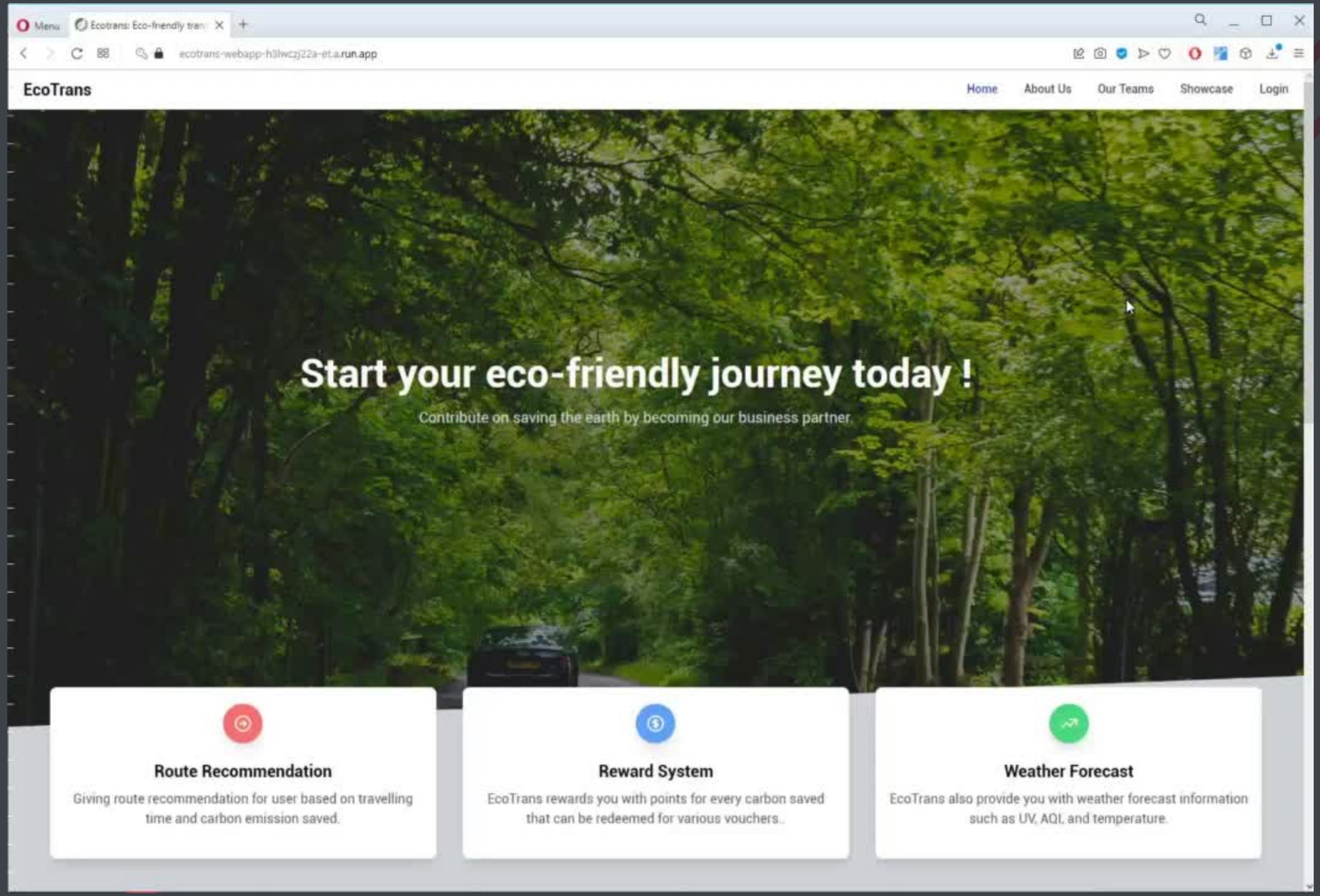


Route recommendation

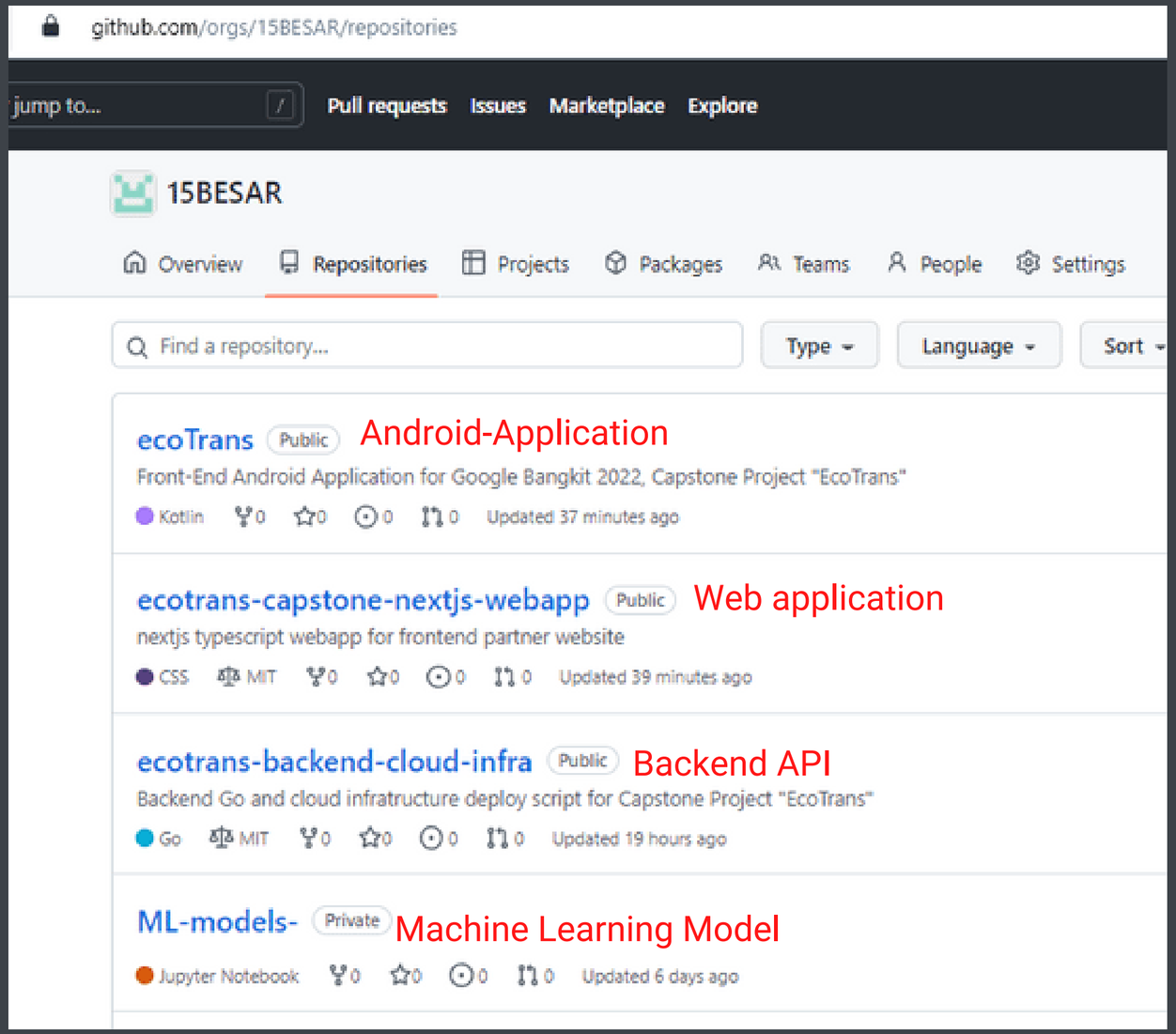
Point system & Redeem Voucher



Web Application Demonstration

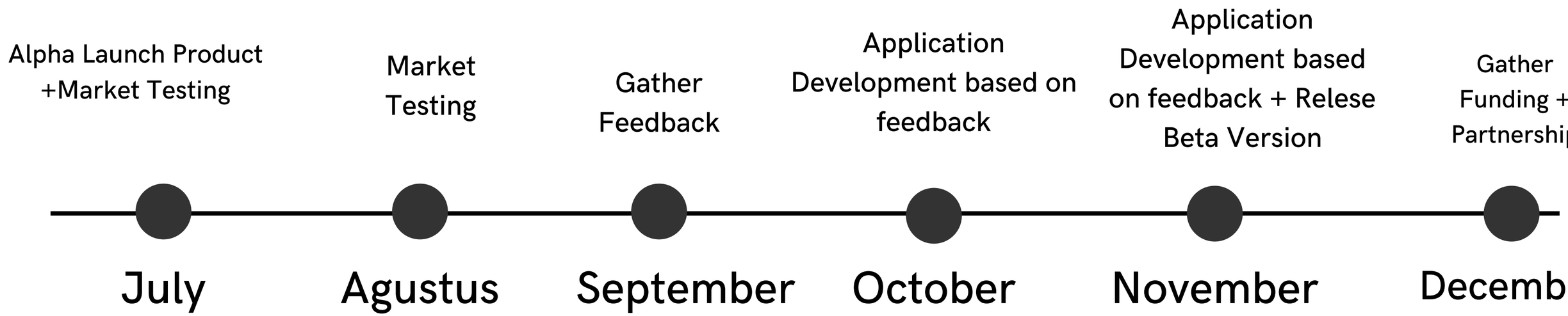


Documentation



- Collaborations are done inside repositories inside github organisations.
- A description of the project is given in the readme along with instructions for replicating the project

Timeline for next 6 Months



Budgeting Case #1: USD 5K

Budgeting - 1 - USD 5k / IDR 70m

Category	Proportions*	Budget (max) in USD
Team Salary	29%	$1.450 / Rp 20.300.000
Research / Operational 1. buying/renting things, 2. prototyping, 3. infrastructure 4. learning/capacity building, 5. survey/FGD/data collections 6. transportation expenses 7. Additional salary for external experts, observer, respondents 8. productions preparations, tooling 9. legalities, patent/copyright registration, product certification	71%	$3.550 / Rp 49.700.000

Budgeting Case #2: USD 10K

Budgeting - 2 - USD 10k / IDR 140m

Category	Proportions	Budget (max) in USD
All aspects covered in Budgeting - 1	50%	$5.000 / Rp 70.000.000
Additional Budget for Team Salary	14%	$1.400 / Rp 19.600.000
Future Development (R&D)	16%	$1.600/ Rp 22.400.000
Marketing and Sales	10%	$1.000 / Rp 14.000.000

THE END

APPENDIX

Business Model Canvas

Key Partners

Businesses

- Public transport providers (PT KAI, PT Transjakarta, etc.)
- Have sustainability plan related to environments *(voucher providers)*

Government:

- Dinas Perhubungan DKI Jakarta

Key Activities

- Research & Development
- Marketing
- Forecast Modeling
- App Maintenance

Key Resources

- Server
- Frontend, Backend, ML Developers
- Environmental Specialists

Value Propositions

- Rewards points to users based on carbon offsets, which can be redeemed to vouchers.
- Provides the best public transport routes based on travel time & least carbon emission.
- Hourly forecasting of Air Quality, Temperature & UV Index for travel plan insights.
- Helps users to reduce carbon footprints & air pollution.

Customer Relationships

- Support / Help Center
- Customer Relationship Management (CRM)

Channels

- Billboards
- Social Media
- Radio
- Google Playstore
- Online Ads

Customer Segments

Individuals:

- Live in DKI Jakarta & travel frequently
- Environmentally conscious

Businesses:

- Seek exposure through ads
- Have sustainability plan related to environments

Cost Structure

- Server
- Payroll
- Advertising
- Research & Development
- App Maintenance
- Office & Supplies

Revenue Streams

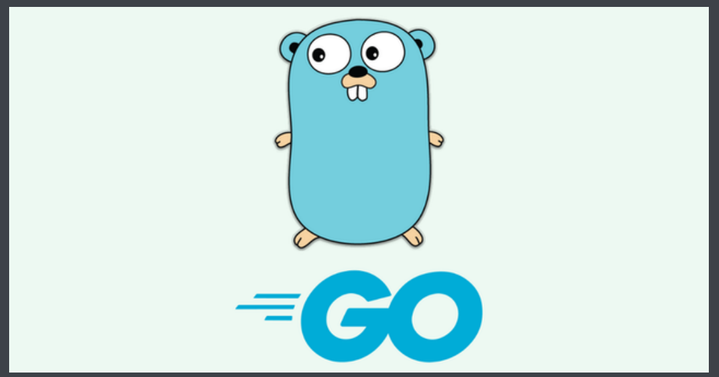
- Advertisement (Pay-Per-Click & other schemes)
- Funding
- Premium Accounts (future development)

Cloud Computing

Backend Deployment

Database

Programming Language (Backend)



Programming Language (Frontend)

NEXT.JS

Cloud Computing

Gmaps Platform

Our Application using Gmaps Platform to :

Real time location data of User

Route Suggesting

Find the carbon saved based on the route

Give direction to user to follow the route

Mobile Development

Android Studio (Kotlin)

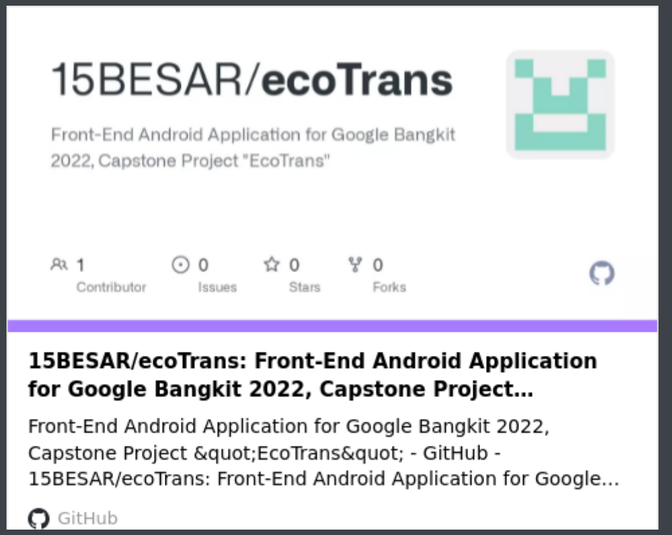
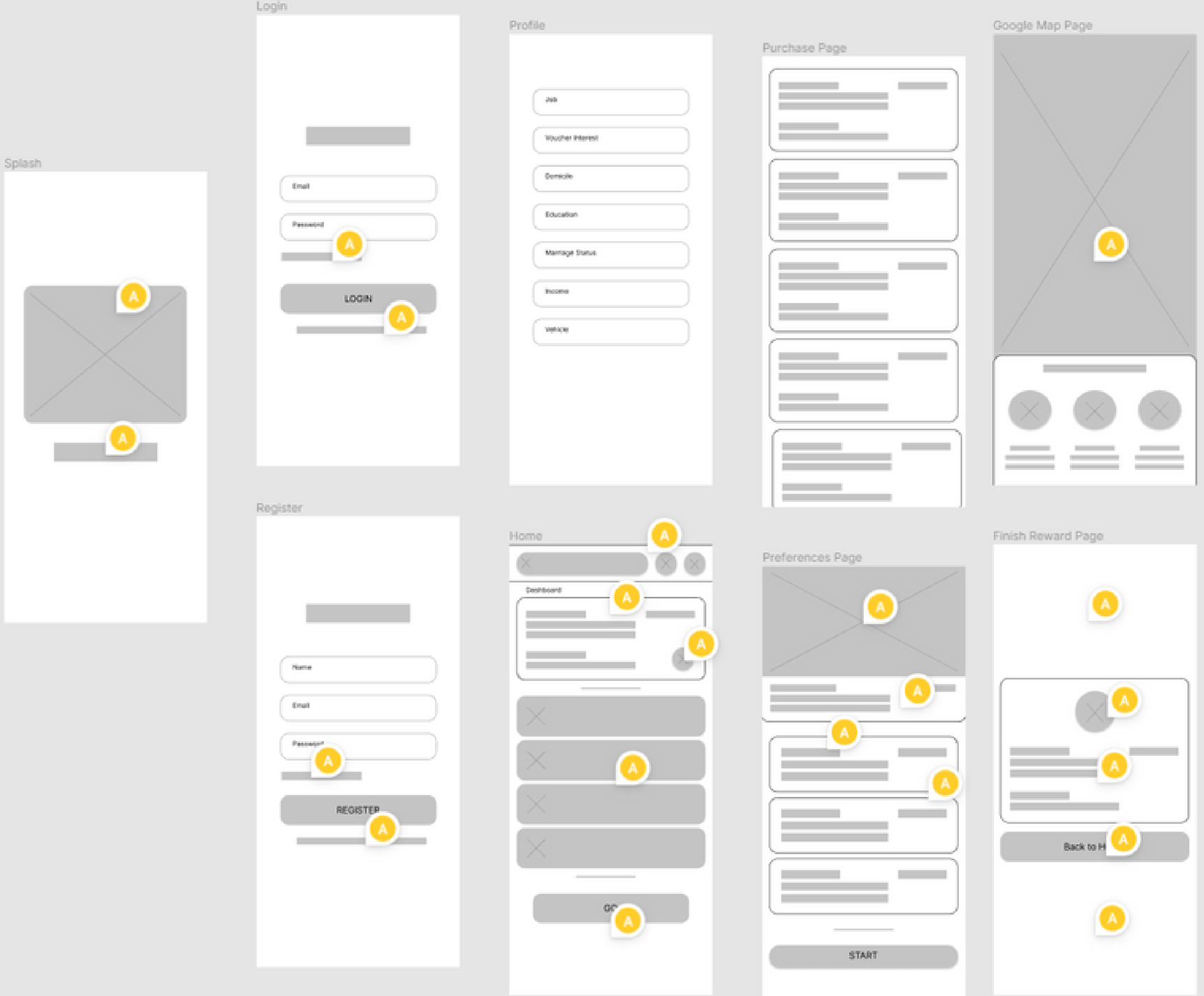
Modern Android Development

Android Jetpack

- Animations & Transitions
- Fragment
- Layout
- Permissions
- Data Binding
- Lifecycles
- LiveData
- ViewModel
- Android KTX

Frontend

Git Repository & Demo App



Mobile App Mockup Design