



FINAL PROJECT

# Aplikasi Monitoring Kebun Hidroponik Berbasis *Mobile*

Fernanda Daymara Hasna





## Latar Belakang

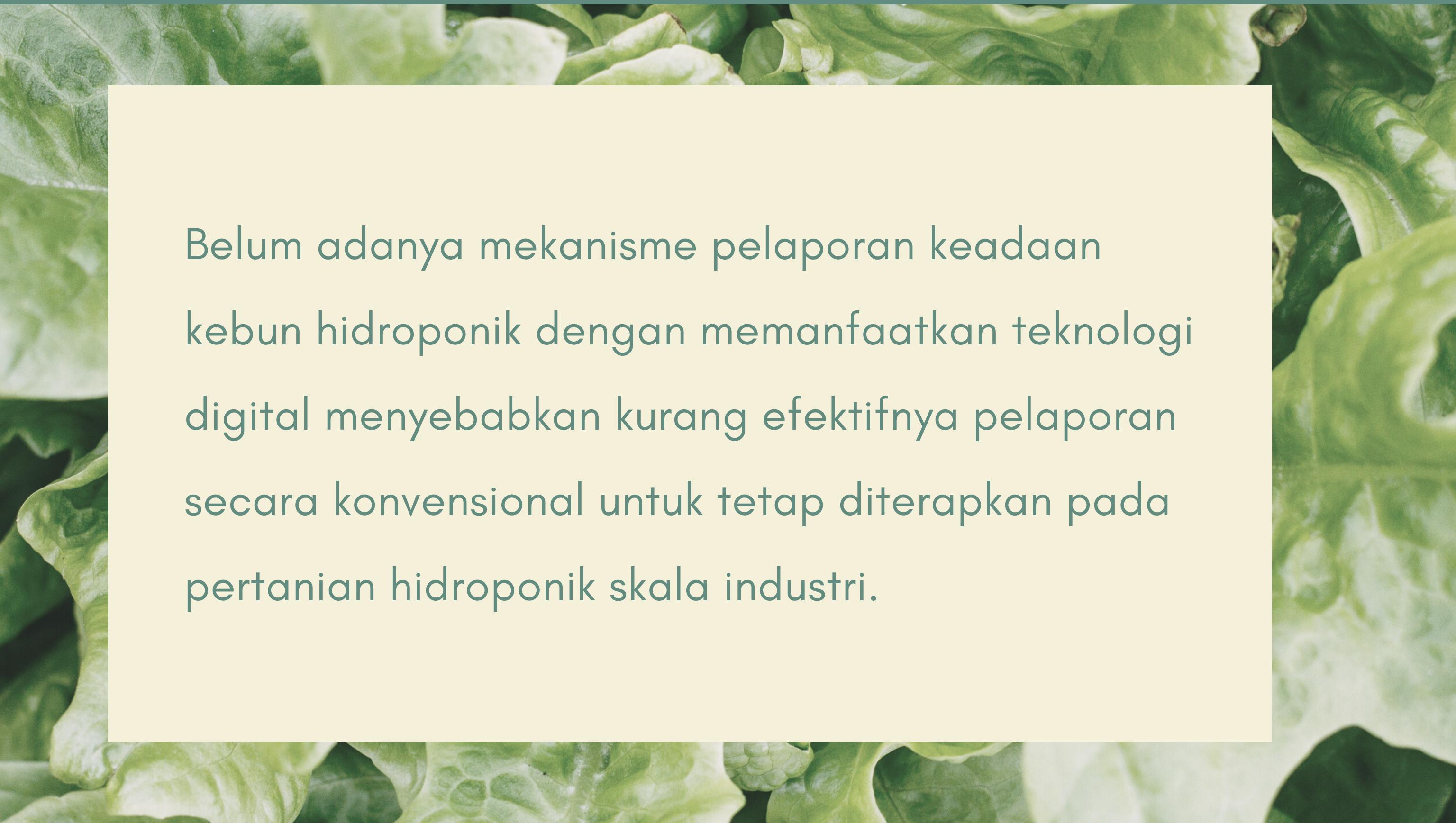
- Sistem pelaporan masih dilakukan secara manual dan tidak terintegrasi
- Pekerjaan rutinitas dan beban kerja yang kompleks



## PENDAHULUAN

# Permasalahan

Belum adanya mekanisme pelaporan keadaan kebun hidroponik dengan memanfaatkan teknologi digital menyebabkan kurang efektifnya pelaporan secara konvensional untuk tetap diterapkan pada pertanian hidroponik skala industri.



Untuk memudahkan pekerjaan petani,  
maka penulis mempersesembahkan :

# Nydrobionics

Aplikasi Monitoring Kebun Hidroponik

yang diharapkan dapat mempermudah petani dalam memberikan laporan keadaan dan memantau kondisi lingkungan kebun hidroponik yang menunjang kualitas tanaman dan hasil panennya.

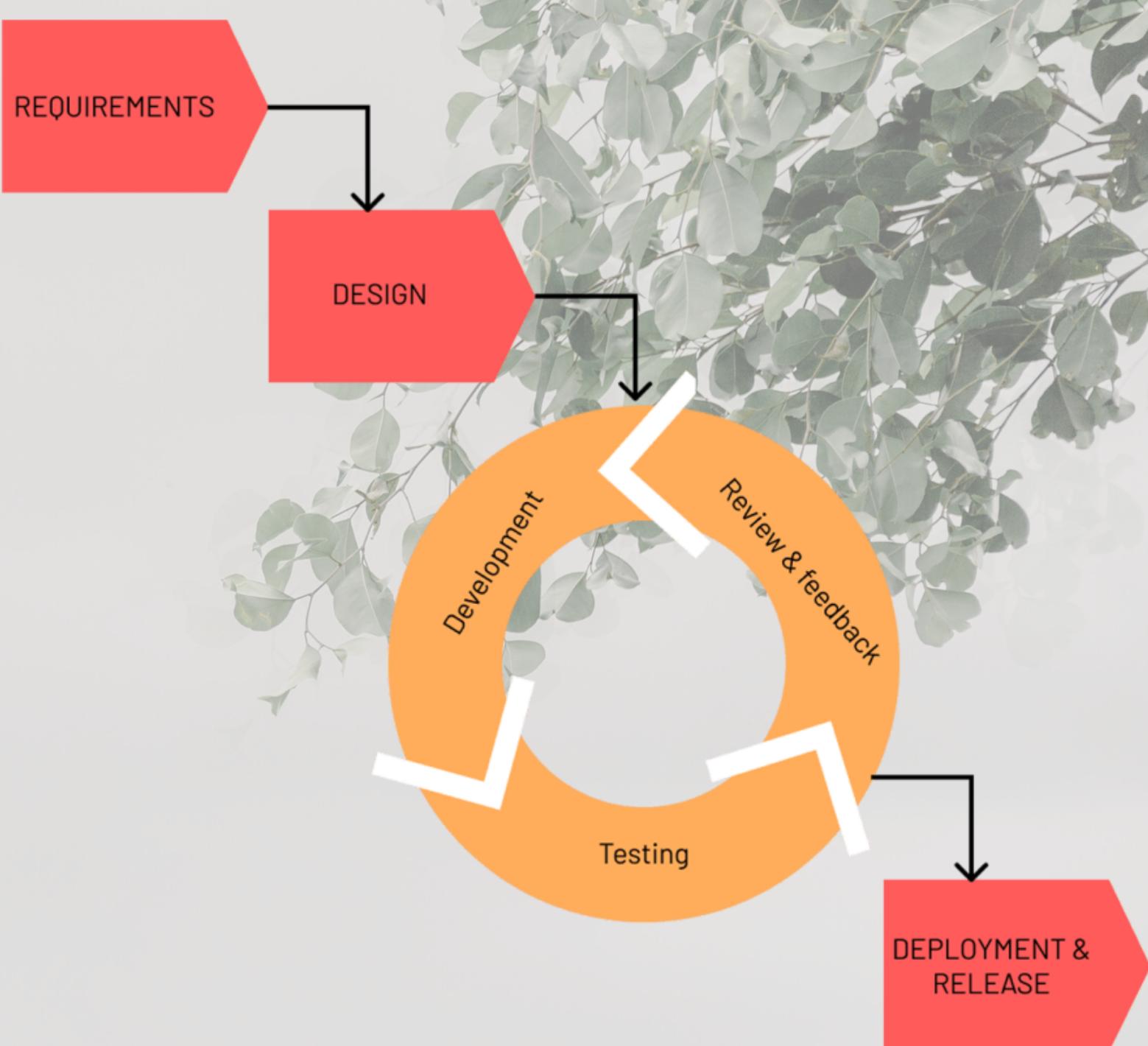
- Aplikasi *mobile* yang dikembangkan untuk **Android**.
- Setiap akun hanya dapat memiliki **1 jenis role yang tidak dapat diubah**, yaitu Owner (pemilik).
- Setiap akun hanya **terintegrasi dengan 1 kebun** sehingga Owner hanya dapat memiliki 1 kebun.
- Setiap kebun dapat memiliki **beberapa kit** yang dapat dibuat oleh setiap anggota kebun.
- Pengelolaan tanaman yang ditanam hanya meliputi **penambahan tanaman**.
- Data monitoring kebun dapat **diinput manual** melalui aplikasi yang dirancang.



## Batasan Masalah

## TEKNOLOGI YANG TERAPKAN

- Metodologi *Hybrid*
- Arsitektur MVVM
- View Binding
- Firebase Cloud Firestore



## PROFIL APLIKASI

**Nydrobionics** adalah *mobile application* berbasis Android untuk monitoring kebun hidroponik agar memudahkan system pelaporan kondisi kebun dan meningkatkan akurasi data saat dicek dan dilaporkan.

Aplikasi ini memungkinkan pengguna untuk memantau keadaan kebun hidroponik dengan tujuan dapat mengatur konsistensi variabel-variabel yang memengaruhi kualitas hasil panen.



# FITUR YANG DIKEMBANGKAN



## HYDROPONIC MONITORING

Pemantauan keadaan kebun seperti kondisi suhu, kelembaban udara , tingkat keasaman air, kejernihan air, kapasitas tanki air dan pupuk cair

## PLANT NYDRODB

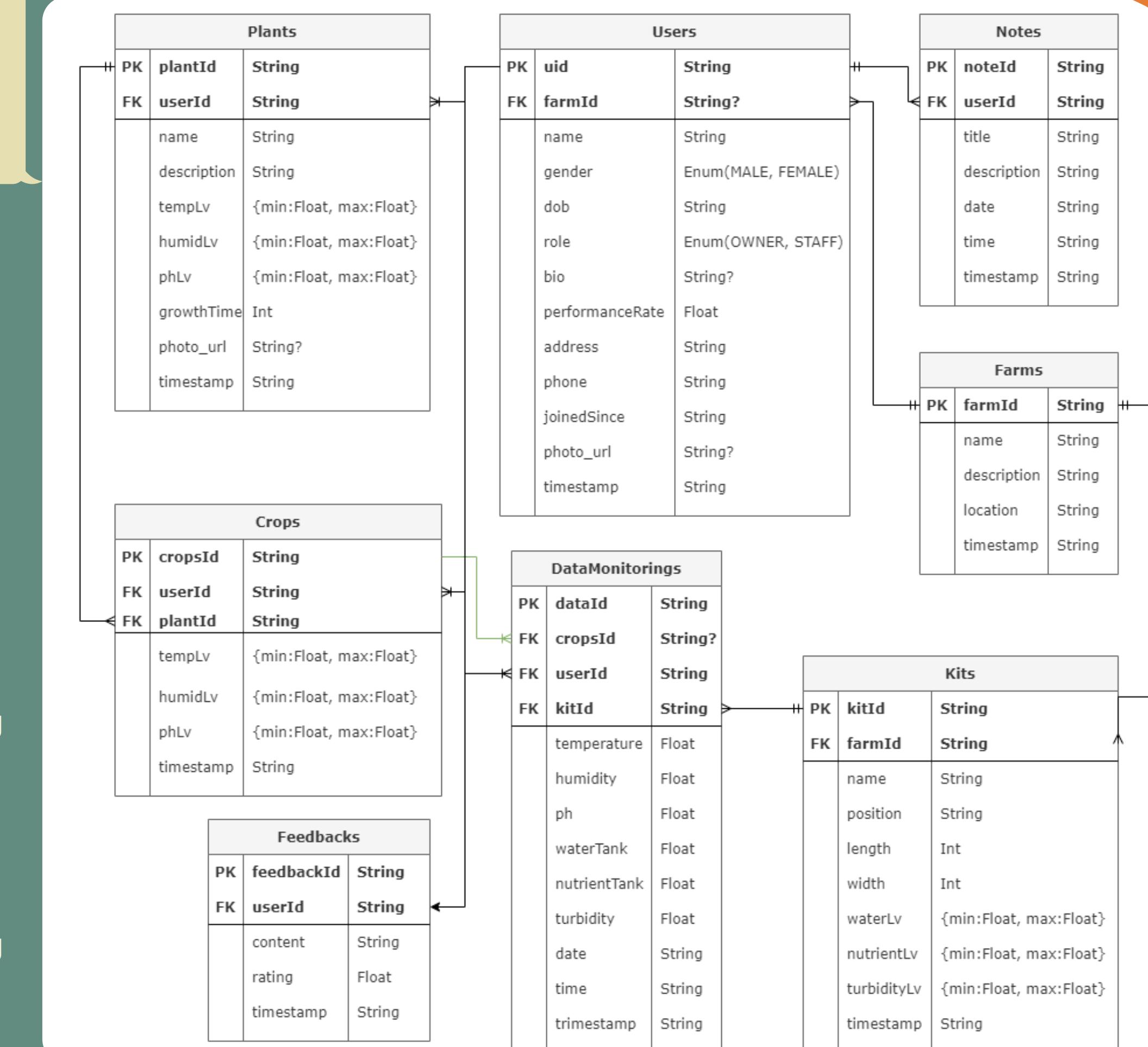
Database tanaman seperti nama tanaman, nilai ideal (suhu, kelembaban udara, dan pH air), dan estimasi waktu yang dibutuhkan untuk siap panen.

## SCHEDULE AND NOTES

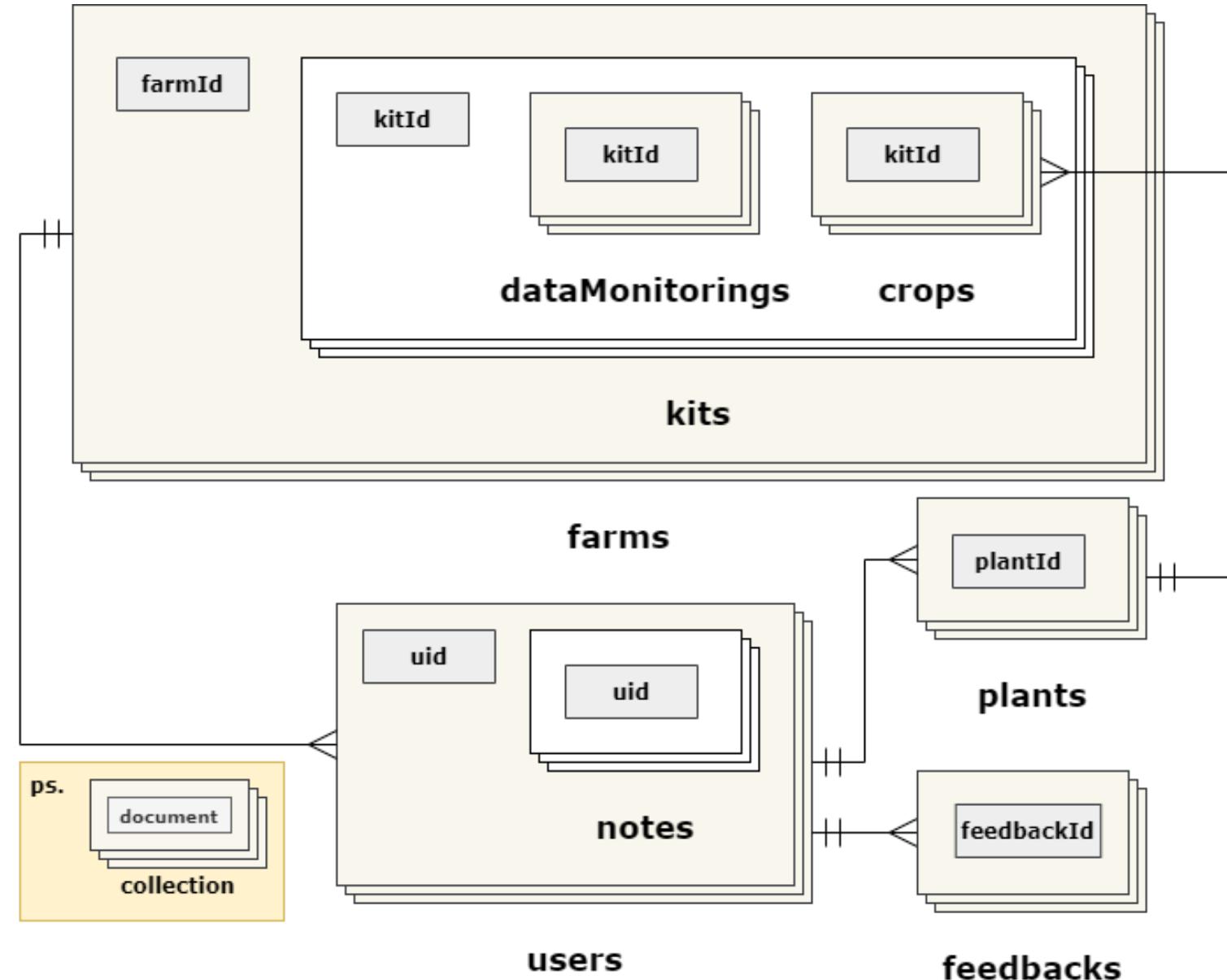
Database catatan dan jadwal untuk petani hidroponik

# Entity Relationship Diagram

- 1 user =
  - ∞ note
  - ∞ feedback
  - ∞ dataMonitoring
  - ∞ crops
  - ∞ plants
  - 1 farm
- 1 note = 1 user
- 1 farm =
  - ∞ user
  - ∞ kit
- 1 kit =
  - ∞ dataMonitoring
  - ∞ crops
  - 1 farm
- 1 crops =
  - ∞ dataMonitoring
  - 1 user
  - 1 plant
- 1 plant =
  - ∞ crops
  - ∞ dataMonitoring
  - 1 user
- 1 feedback = 1 user



# Struktur Database



ERD mengalami perubahan menjadi bentuk *collection-document* dengan ID sebagai *document ID*:

- 1 **Users**  
+ Notes
- 2 **Farms**  
+ Kits (dataMonitoring & Crops)
- 3 **Plants**
- 4 **Feedbacks**

# Activity Diagram

- **Application Intro**

Splash Screen, Sign In, Sign Up, Forget Password

- **Create and Edit Profile**

Create User Profile, Create Farm Profile

- **Main Application**

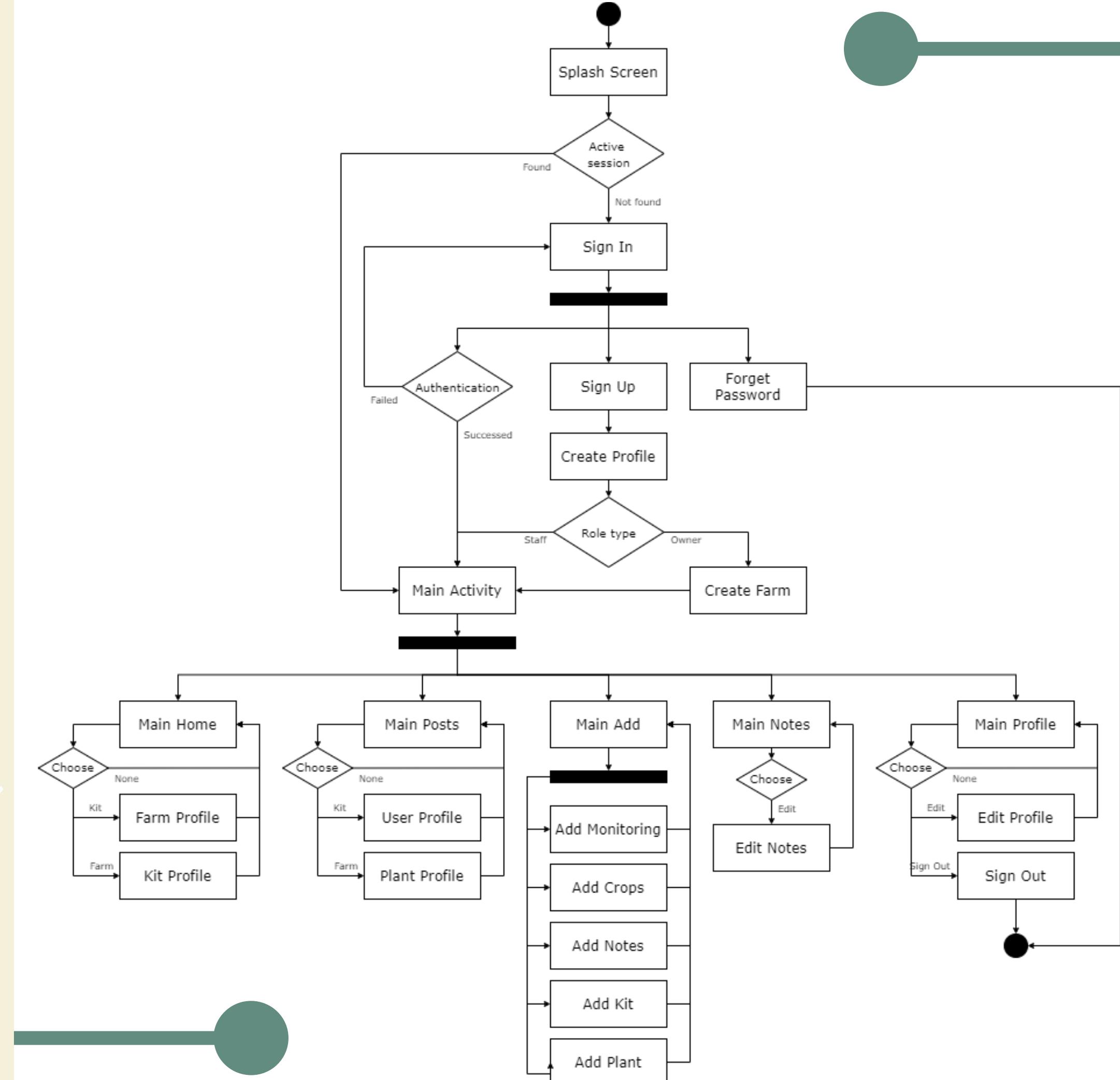
Main Home, Main Posts, Main Add, Main Notes, Main Profile

- **Profile**

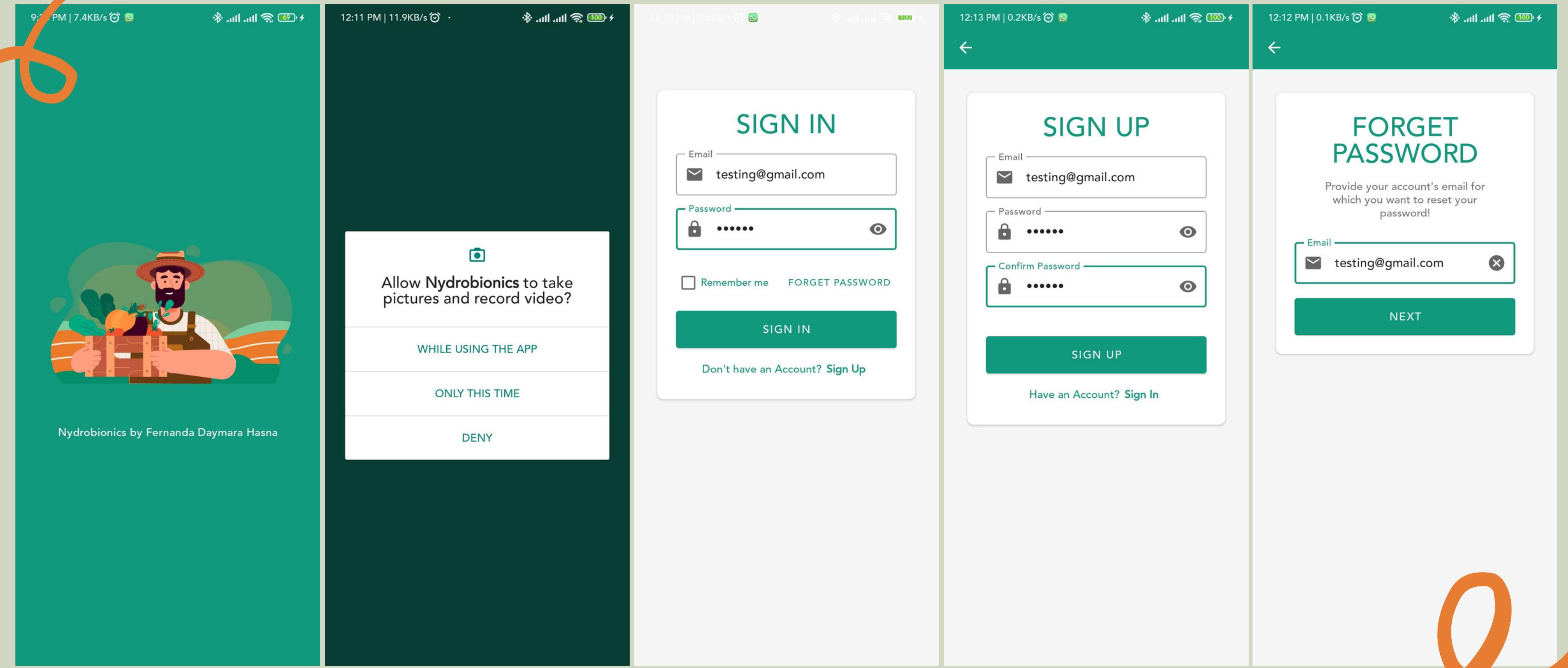
User Profile, Farm Profile, Kit Profile

- **Add and Edit**

Data Monitoring, Crops, Note, Kit, Plant



# Application Intro



# Edit Profile

12:16 PM | 0.1KB/s   
← Farm

Farm Name  
Kebun Coba Aja

Farm Description  
Ini buat coba coba  
18/100

Farm Location  
Bekasi

Farm Staff  
 testing@gmail.com  
Testing Account

ADD STAFF

SAVE

12:15 PM | 37.8KB/s   
← Edit Profile



Email  
testing@gmail.com

Name  
Testing Account

Phone Number  
08123456789

Address  
Bekasi

Bio  
Akun cobacoba aja  
18/100

Date of Birth  
05 October 202

SAVE

# Create Profile

12:14 PM | 90.8KB/s

Create Farm

Farm Name  
Kebun Coba

Farm Description  
Ini buat coba coba  
18/100

Farm Location  
Bekasi

CREATE FARM

12:14 PM | 2.7KB/s

Create Profile



Email  
testing@gmail.com

Name  
Testing Account

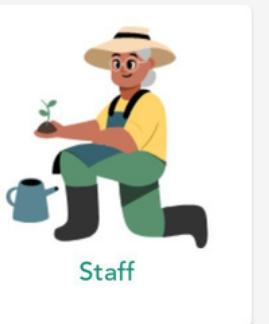
Phone Number  
08123456789

Address  
Bekasi

Bio  
Akun cobacoba  
13/100

Date of Birth  
05 October 202

Select your role



Owner is someone who has the farm.

CREATE PROFILE

# Main Application

12:18 PM | 0.4KB/s 100%

Home

Kebun Coba Aja

Kit satu  
Updated on 2021/10/16 12:18

TEMPERATURE 0.2 °C	HUMIDITY 0.1	ACIDITY LEVEL 0.1
WATER LEVEL 0.1	NUTRIENT LEVEL 0.1	TURBIDITY 0.1

SHOW MORE

12:16 PM | 6.1KB/s 100%

Social

lix.lixieee@gmail.com  
hurray

hore will ready to harvest in 6 days with ideal condition :

- Temperature : 0.20 - 5.50 °C
- Humidity : 0.10 - 0.30 RH
- pH : 0.20 - 0.30

2021/10/16 06:26

asdfgh@gmail.com  
test123

teating will ready to harvest in 1 days with ideal condition :

- Temperature : 0.10 - 0.20 °C
- Humidity : 0.10 - 0.20 RH
- pH : 0.10 - 0.20

2021/10/16 06:24

lix.lixieee@gmail.com  
hurray

aa will ready to harvest in 1 days with ideal condition :

- Temperature : 0.20 - 0.30 °C
- Humidity : 0.20 - 0.30 RH
- pH : 0.10 - 0.20

2021/10/10 20:21

lix.lixieee@gmail.com  
hurray

12:57 PM | 4.4KB/s 100%

Home

Kebun Coba Aja

Kit satu  
Updated on 2021/10/16 12:18

TEMPERATURE 0.2 °C	HUMIDITY 0.1	ACIDITY LEVEL 0.1
WATER LEVEL 0.1	NUTRIENT LEVEL 0.1	TURBIDITY 0.1

What would you like to do?

- Add recent data monitoring
- Add new crops to plant
- Add note
- Create new hydroponic kit to farm
- Add new plant to NydroDB

12:15 PM | 0.4KB/s 100%

Notes

2021  
kedua  
ini kedua  
2021/10/16 12:15

ketiga  
ini ketiga  
2021/10/16 12:15

Pertama  
ini deskripsi  
2021/10/16 12:14

12:14 PM | 0.0KB/s 100%

Profile

Testing Account  
Akun cobacoba

Role Owner of Kebun Coba  
Joined company since 16 October 2021

Performance Rate

Email testing@gmail.com  
Phone Number 08123456789  
Address Bekasi

# Main Application

The application interface consists of five main screens:

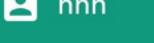
- Home:** Displays real-time sensor data for a kit labeled "Kit satu". Data includes Temperature (0.2 °C), Humidity (0.1), Acidity Level (0.1), Water Level (0.1), Nutrient Level (0.1), and Turbidity (0.1). A "SHOW MORE" button is present.
- Social:** Shows posts from users "hurray" and "teating". Each post includes a timestamp and a list of ideal conditions for harvesting.
- Profile:** A central profile screen with a sidebar menu containing General, Support, Role, Joined company, Performance Rate, Email, Phone Number, Address, Language Settings, App Permission, Feedback, About, and Sign Out options. The version number 1.0 is at the bottom.
- Notes:** Lists notes from 2021, such as "kedua ini kedua" and "ketiga ini ketiga".
- Profile (Right):** Details for a user named "Testing Account" (Akun cobacoba). It includes a profile picture, role (Owner of Kebun Coba), joining date (16 October 2021), performance rate (★★★★★), email (testing@gmail.com), phone number (08123456789), and address (Bekasi).

# User Profile

12:16 PM | 2.4KB/s 📺 100%

← hurray

 hurray Email

 hhh

 Farm

lix.lixieee@gmail.com  
hurray

aa will ready to harvest in 1 days with ideal condition :

- Temperature : 0.20 - 0.30 °C
- Humidity : 0.20 - 0.30 RH
- pH : 0.10 - 0.20

2021/10/10 20:21

lix.lixieee@gmail.com  
hurray

plant2 will ready to harvest in 2 days with ideal condition :

- Temperature : 0.10 - 0.20 °C
- Humidity : 0.10 - 0.20 RH
- pH : 0.10 - 0.20

2021/10/10 20:13

lix.lixieee@gmail.com  
hurray

w will ready to harvest in 2 days with ideal condition :

- Temperature : 0.10 - 0.20 °C
- Humidity : 0.10 - 0.20 RH

# Kit Profile

12:18 PM | 0.5KB/s 📺 100%

← Kit satu

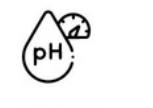
 

OVERVIEW DATA MONITORING CROPS

Updated on 2021/10/16 12:18

 TEMPERATURE 0.2 °C

 HUMIDITY 0.1

 ACIDITY LEVEL 0.1

 WATER LEVEL 0.1

 NUTRIENT LEVEL 0.1

 TURBIDITY 0.1

● Temperature (°C)

0.0 0.5 1.0 1.5 2.0 2.5 3.0

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

● Humidity (RH)

0.0 0.5 1.0 1.5 2.0 2.5 3.0

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

● Acidity Level (pH)

0.0 0.5 1.0 1.5 2.0 2.5 3.0

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

● Water Level (L)

0.0 0.5 1.0 1.5 2.0 2.5 3.0

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

● Nutrient Level (L)

0.0 0.5 1.0 1.5 2.0 2.5 3.0

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

0.40 0.32 0.24 0.16 0.08 0.00

16 OCT ini 

# Add and Edit Data

12:08 PM | 0.1KB/s

Add recent data monitoring  
Kebun Coba Aja

Hydroponic Kit  
Kit satu

Temperature (°C)  
0.2

Humidity (RH)  
0.1

Acidity Level (pH)  
0.1

Water Level (L)  
0.1

Nutrient Level (L)  
0.1

Turbidity (NTU)  
0.1

ADD NEW CROPS

SUBMIT

12:19 PM | 3.4KB/s

Add New Crops  
Kebun Coba Aja

Hydroponic Kit  
Kit satu

Plant Name  
ini

Plant Description  
itu

Growth Time (days)  
3 days

Estimated Harvest  
19 October 2021

Temperature (°C)  
Minimum: 0.20 °C Maximum: 0.30 °C

Humidity (RH)  
Minimum: 0.30% RH Maximum: 0.40% RH

Acidity Level (pH)  
Minimum: 0.2 Maximum: 0.3

SUBMIT

12:15 PM | 0.0KB/s

Add note

Date  
Time

Title  
Ini judul

ini deskripsi

SUBMIT

1:04 PM | 8.1KB/s

Create New Kit  
Kebun Coba Aja

Hydroponic Kit Name  
kit satu

Kit Position Description  
ini satu

Kit Size  
Width: 1 Length: 2

Water Level (L)  
Minimum: 0.1 Maximum: 0.3

Nutrient Level (L)  
Minimum: 0.1 Maximum: 0.3

Turbidity (NTU)  
Minimum: 1 Maximum: 2

SUBMIT

12:17 PM | 53.2KB/s

Add New Plant

Plant Name  
Ini tanaman

Plant Description  
ini deskripsinya

Growth Time (days)  
2

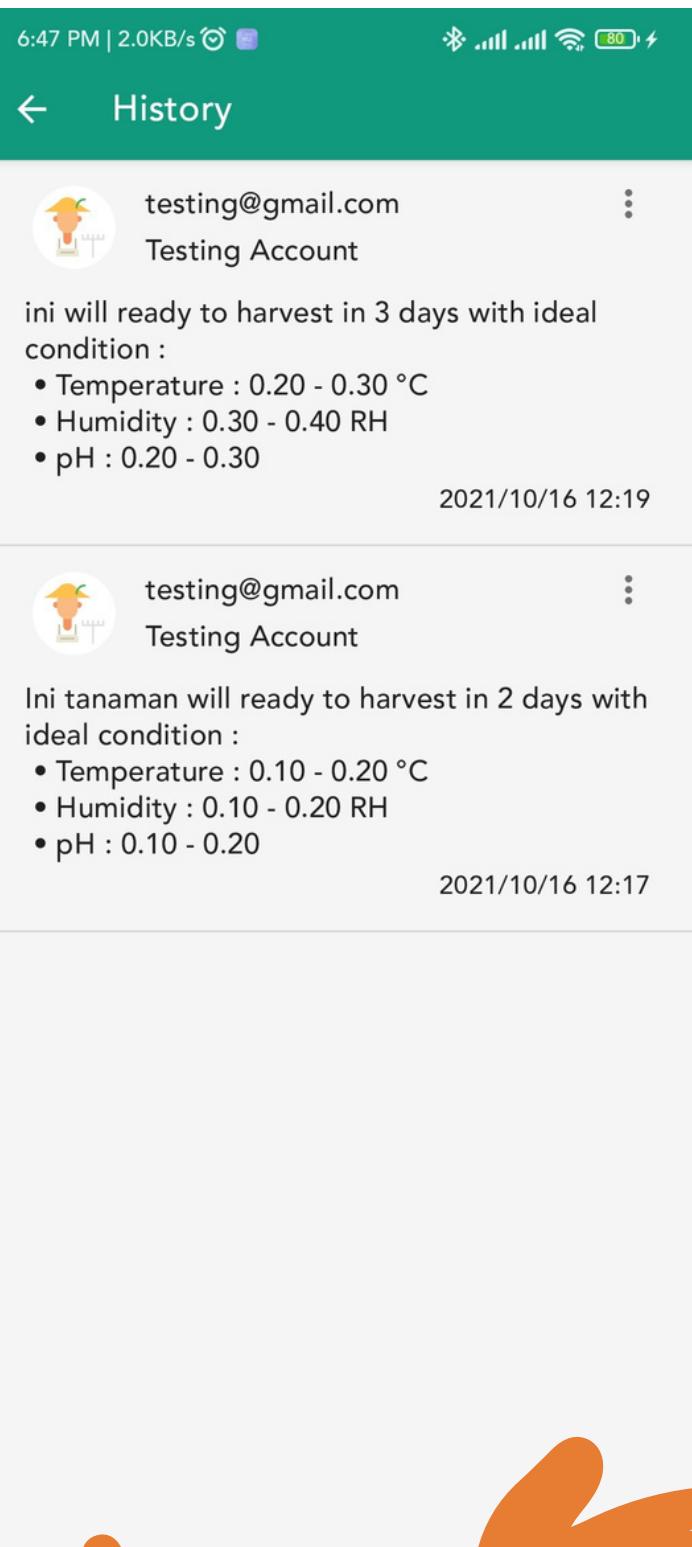
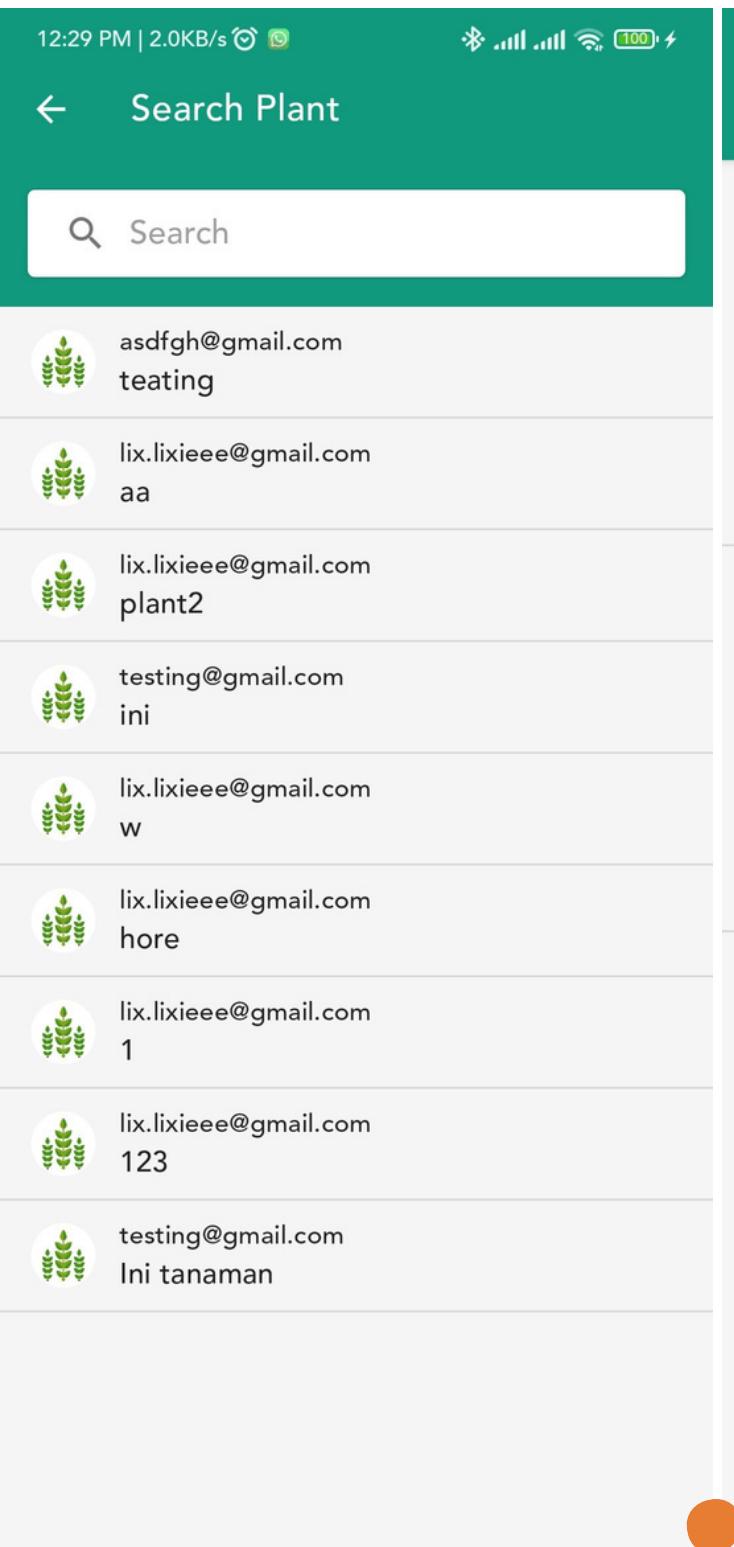
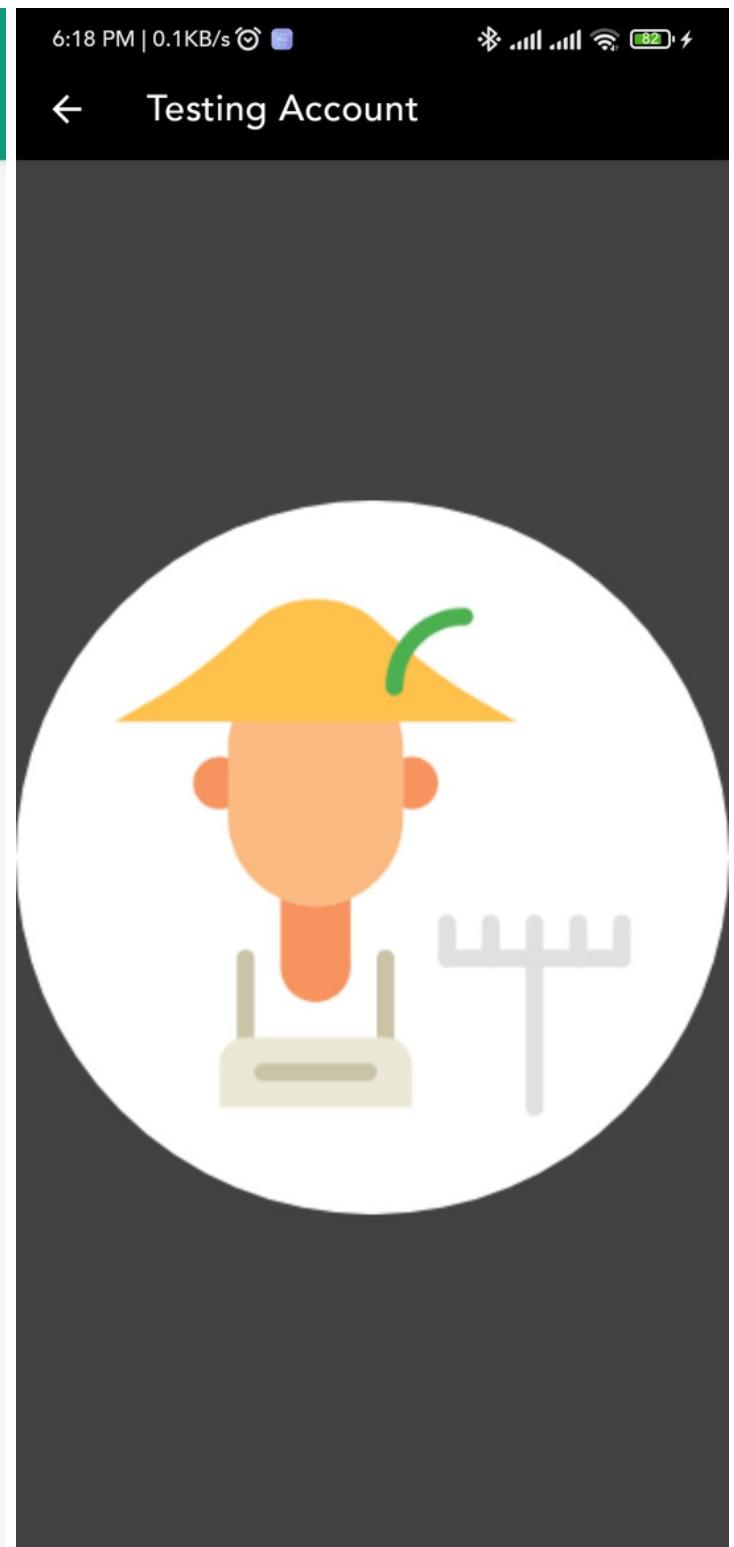
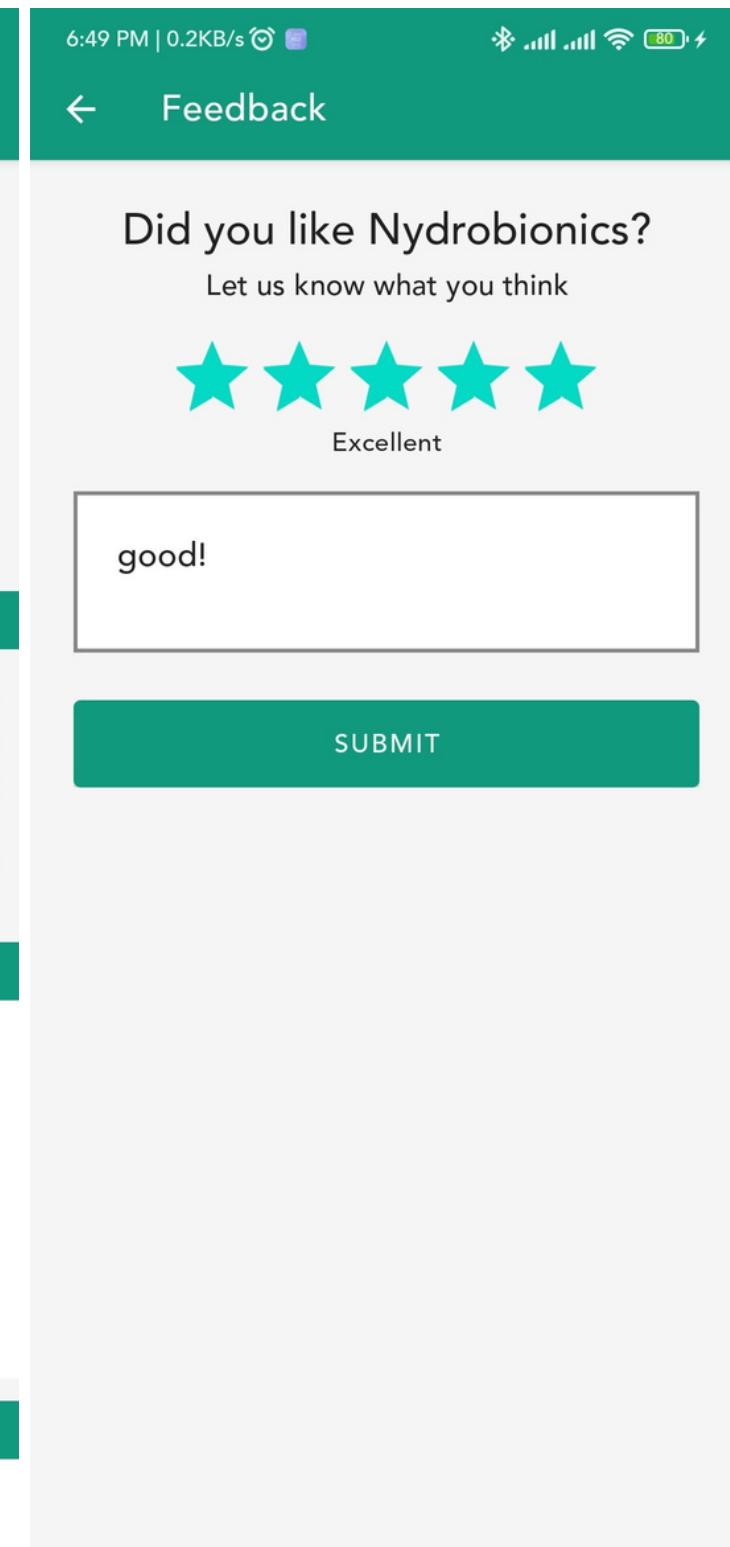
Temperature (°C)  
Minimum: 0.1 Maximum: 0.2

Humidity (RH)  
Minimum: 0.1 Maximum: 0.2

Acidity Level (pH)  
Minimum: 0.1 Maximum: 0.2

SUBMIT

# Others



# Penutup

## KESIMPULAN

- Mengelompokkan *block code* yang muncul secara berulang ke dalam satu *class* untuk memudahkan proses modifikasinya.
- Menggunakan *open source library* dari developer lain dapat mempermudah proses pengembangan.

## SARAN

- Memperbaiki dan menambah fitur lain, seperti :
  - Jenis postingan & *attach document*
  - Jenis *notes* seperti *reminder-schedule*, *todo-list*, *notes*.
  - *Deeplink* ke Firebase saat *forget password*
- Mengefektifkan *codingan back end*



**Nydrobionics**

Fernanda Daymara Hasna  
Mobile Application and Technology  
BBPLK Bekasi – 2021

A large teal rectangular area on the right side of the slide contains the title "Nydrobionics" in bold black font, accompanied by a teal leaf logo. Below the title is a white text block containing the author's name and details about the project.