# Embedded System Software

## Team 1 Presentation

## - KU SMART FARM -

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# Index of Contents

1. Scenario

What is KU Smart Farm?
What kind of Requirements need?

2. Goal

What we want to achieve?
What makes it better?

3. Internal Design

How composes it?
how data flows?

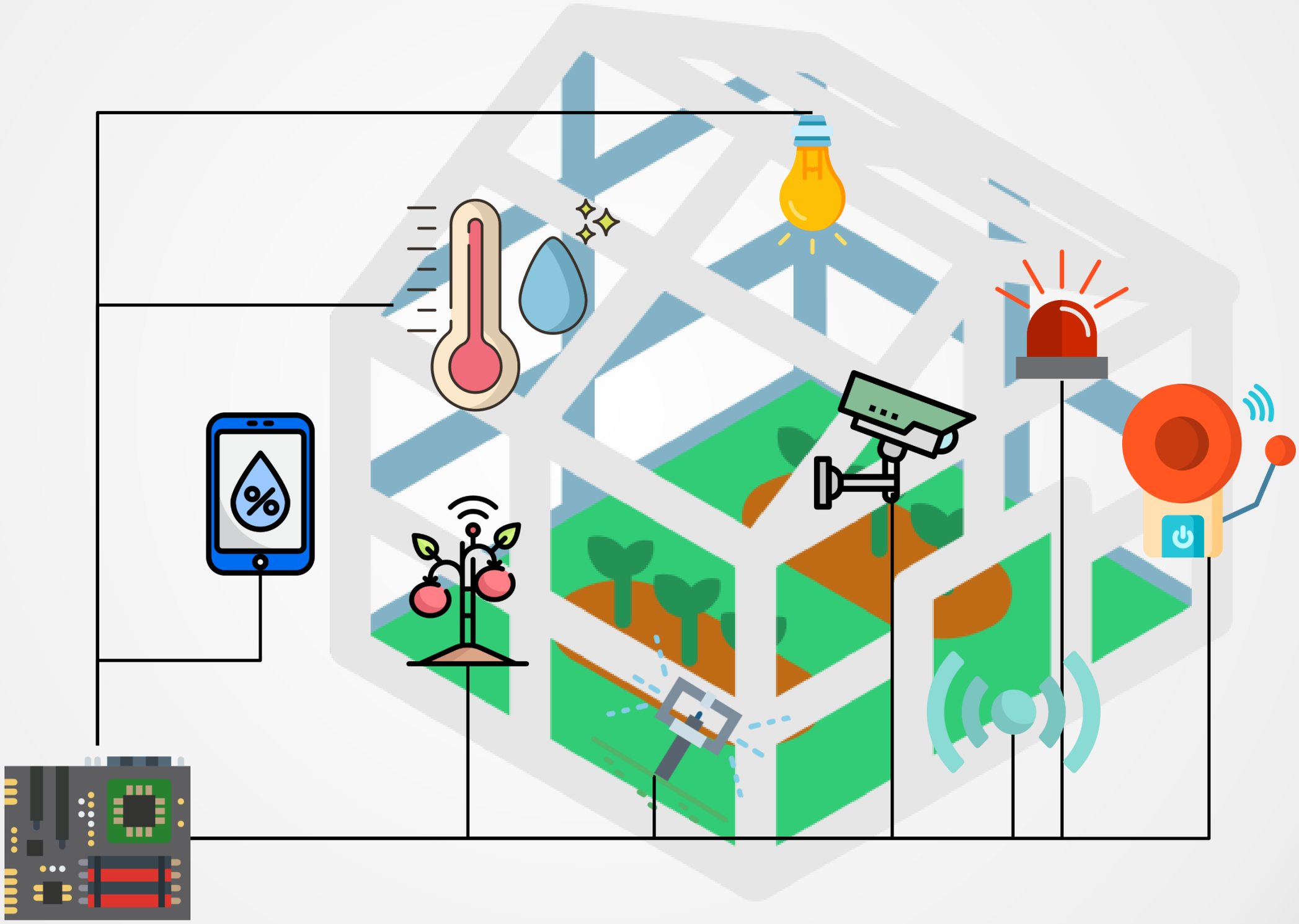
4. Excellence

What’s the Strength
KU Smart Farm has?

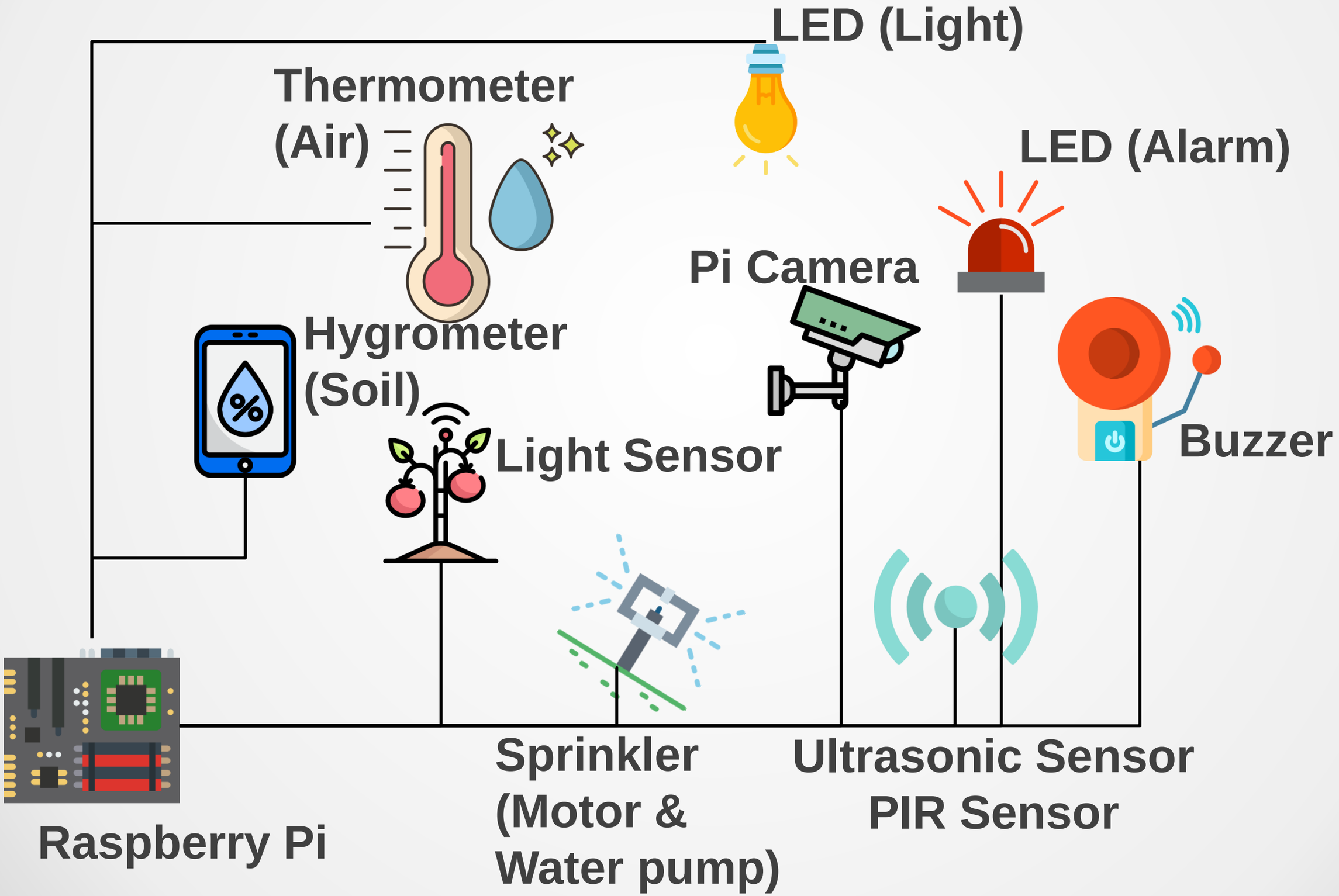
5. Plan

What we have to do?
How much time we have?

# KU Smart Farm



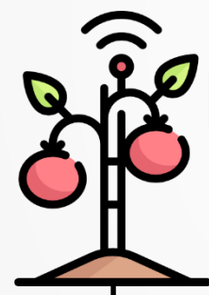
# We Use 10 Kinds of Sensors/Actuators



# Scenario I

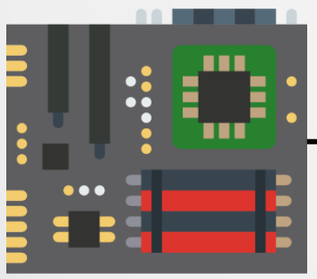
LED (Light)

3. LED를 켠다.



Light Sensor

1. 빛 조도 밝기를 감지한다.



Raspberry Pi

2. 센서로 부터 받은 값을 중앙 컨트롤러에게 보냄. 중앙 컨트롤러로 부터 신호를 받으면 LED를 켜는 신호를 보낸다

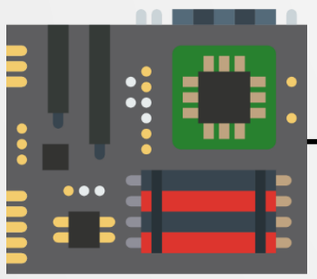
# Scenario II

Hygrometer
(Soil)

1. 토양 습도를 측정한다.

Sprinkler
(Motor &
Water pump)

3. 스프링 쿨러를 켠다.

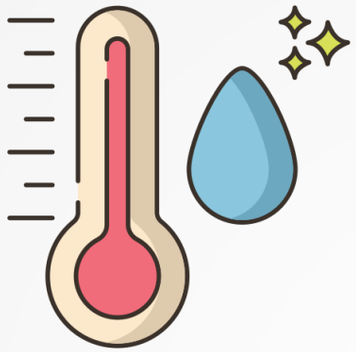


Raspberry Pi

2. 센서로 부터 받은 값을 중앙 컨트롤러에게 보냄. 중앙 컨트롤러로 부터 신호를 받으면 스프링 쿨러를 켜는 신호를 보낸다

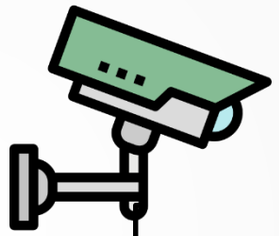
# Scenario III

Thermometer (Air)

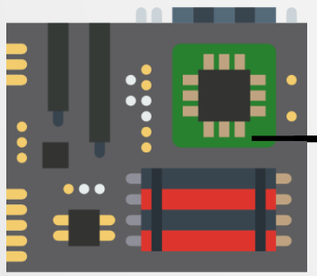


LED (Alarm)

1. 대기 중 온도를 감지한다.



3. 비상 알람을 켠다.



Raspberry Pi

2. 센서로 부터 받은 값을 중앙 컨트롤러에게 보냄. 중앙 컨트롤러로 부터 신호를 받으면 알람을 켜는 신호를 보낸다

# Scenario IV

LED (Alarm)

Pi Camera

Buzzer

3. 비상 알람과 카메라를 작동시킨다.

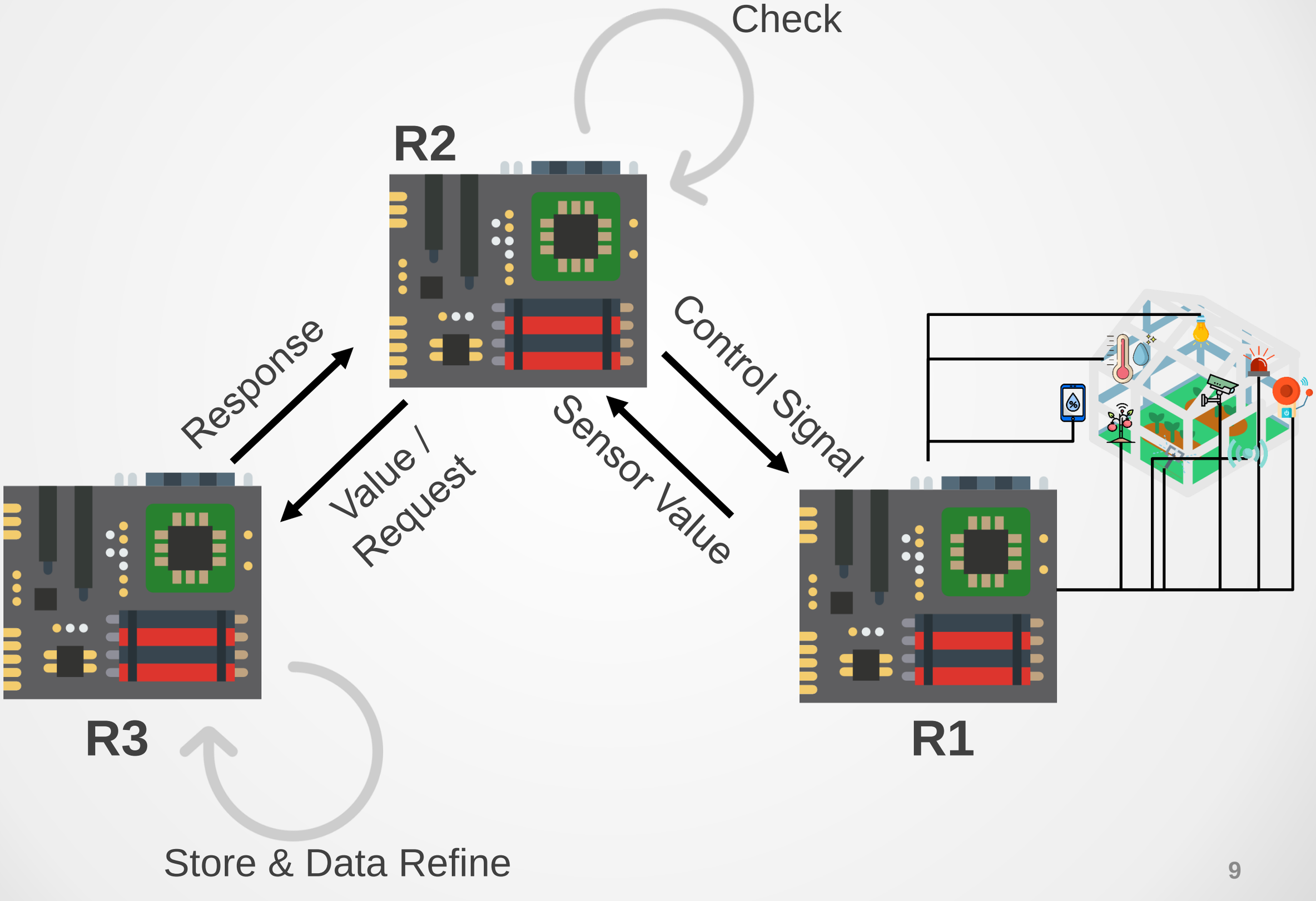
Raspberry Pi

Ultrasonic Sensor
PIR Sensor

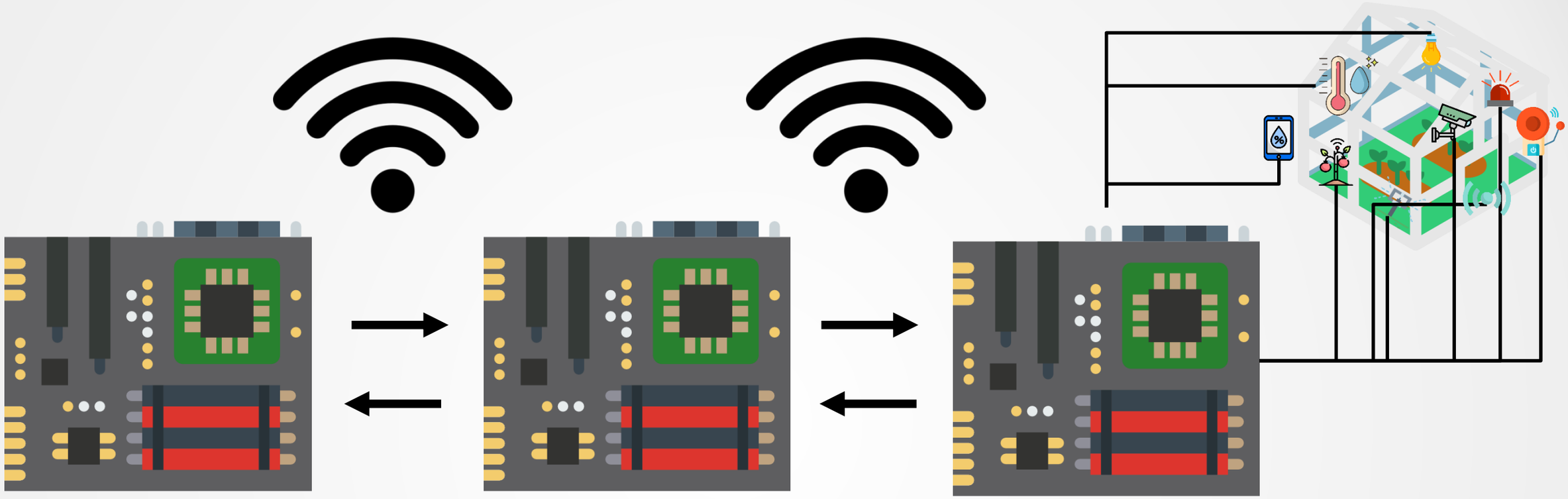
1. 모션과 거리를 측정한다.

2. 센서로 부터 받은 값을 중앙 컨트롤러에게 보냄. 중앙 컨트롤러로 부터 신호를 받으면 알람과 카메라를 켜는 신호를 보낸다

# System Architecture

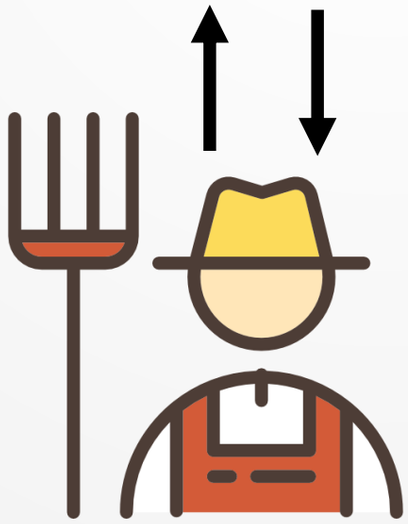


# Overview



Storage

Controller



User

Dev-Controller

# Goal

04

## Network

we use Network to Raspberry-Pis communicate each other.

03

## User-Interface

we Implement user-interface so that user can handle easily

02

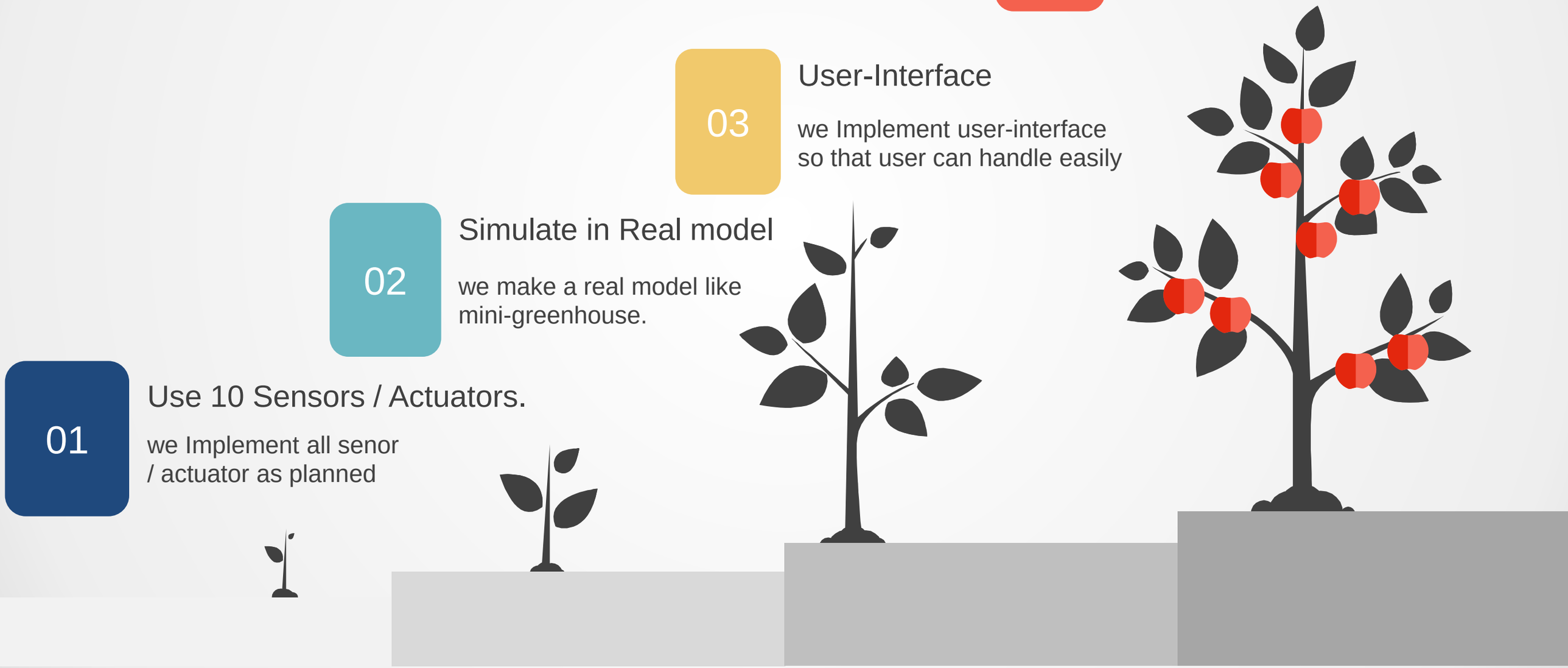
## Simulate in Real model

we make a real model like mini-greenhouse.

01

## Use 10 Sensors / Actuators.

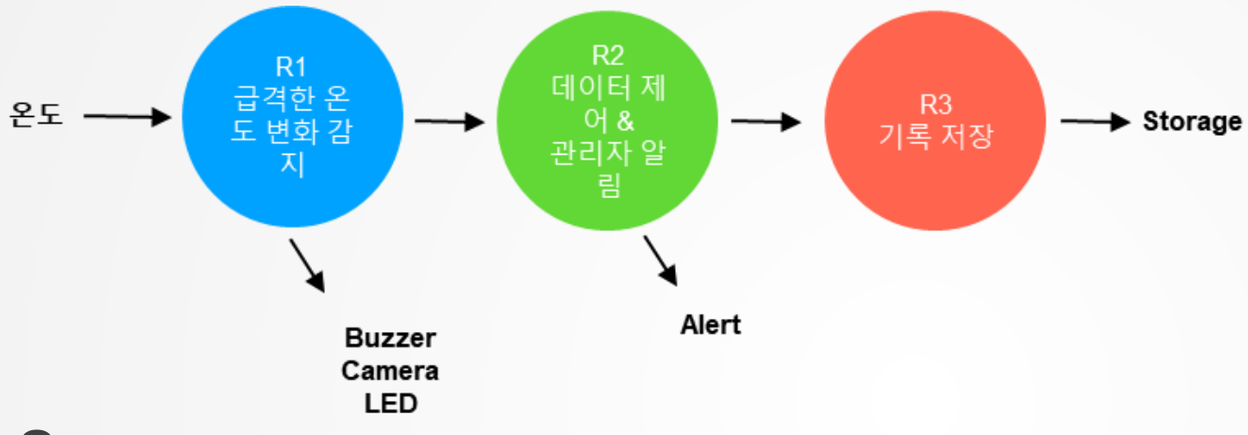
we Implement all senor / actuator as planned



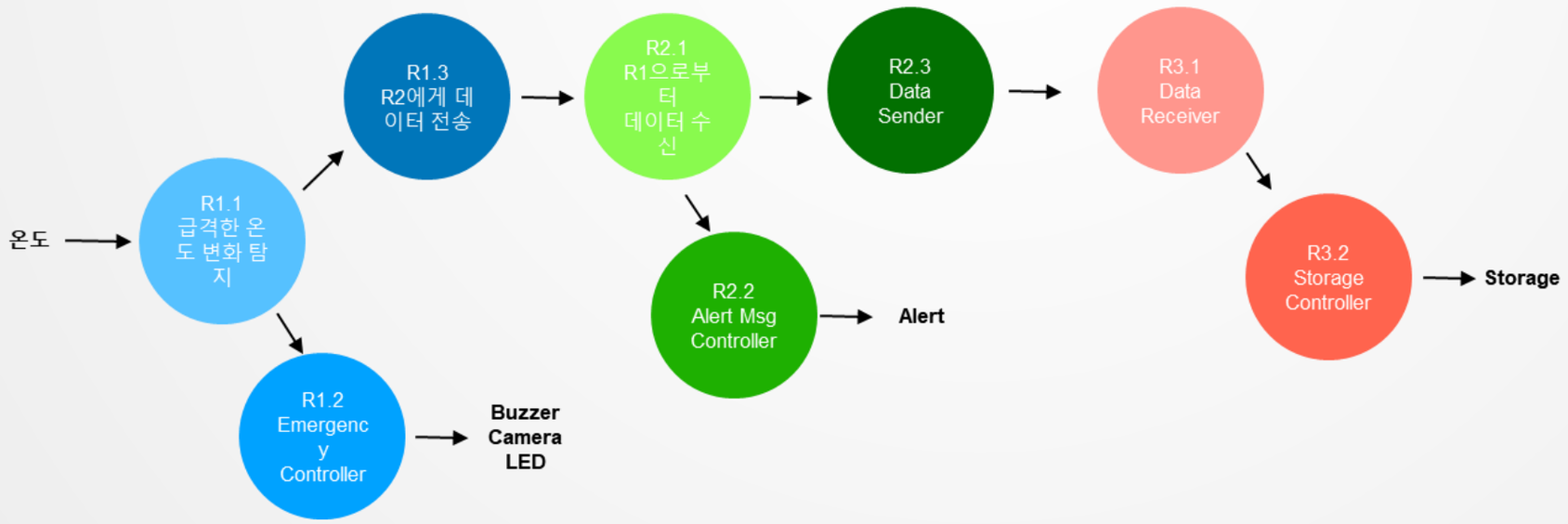
# Internal Design

**비정상 온도 식별 및 알림 시스템 : 온습도 센서 -> Buzzer & LED & Camera**

## Level 1



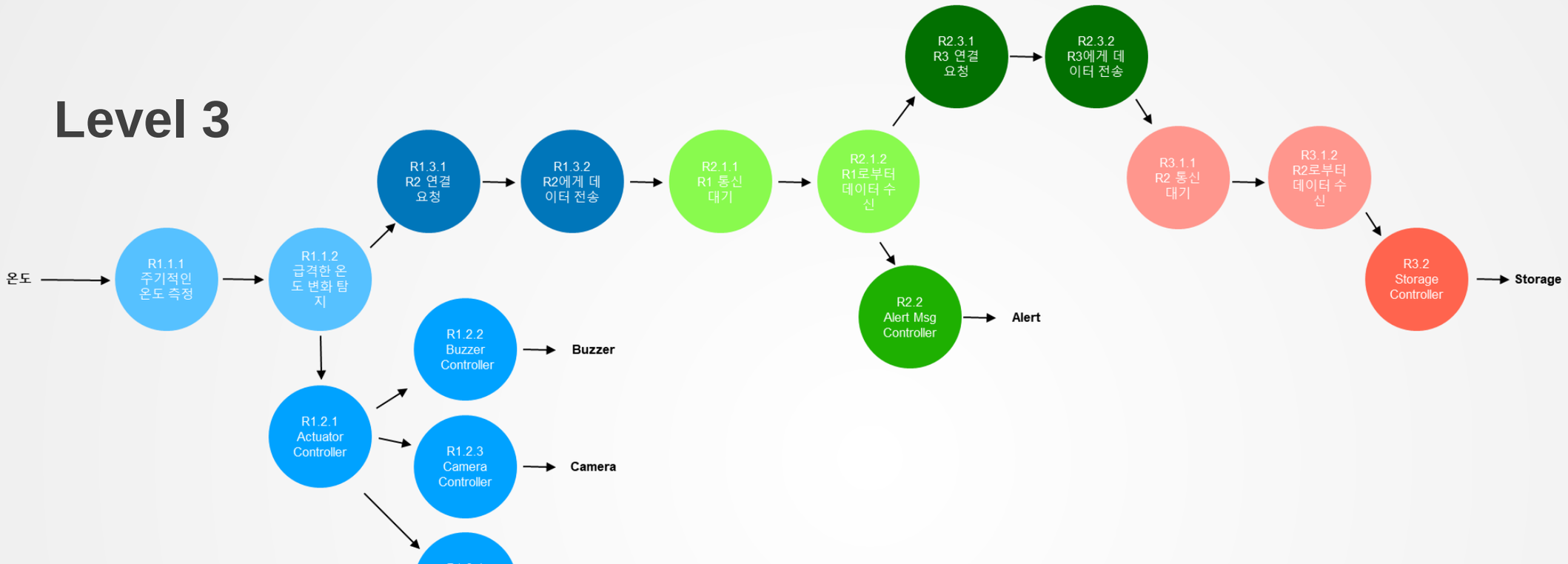

## Level 2



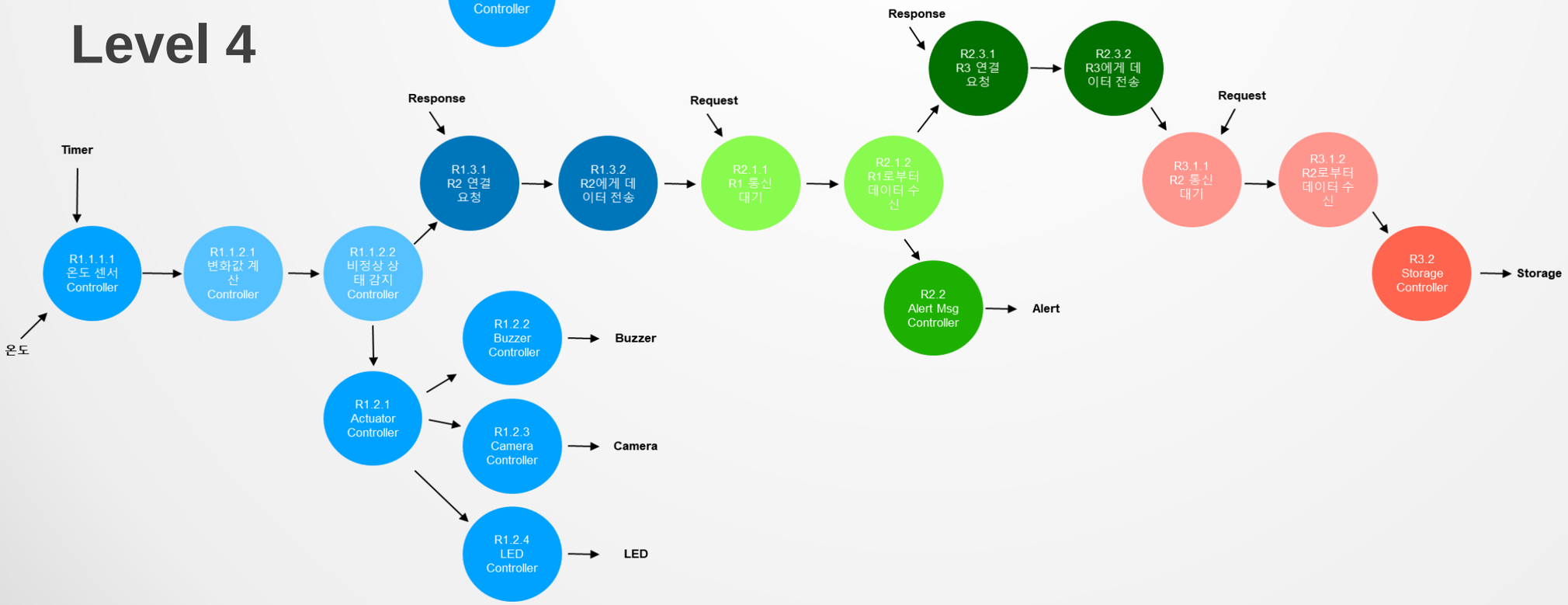
# Internal Design

## 비정상 온도 식별 및 알림 시스템 : 온습도 센서 -> Buzzer & LED & Camera

### Level 3

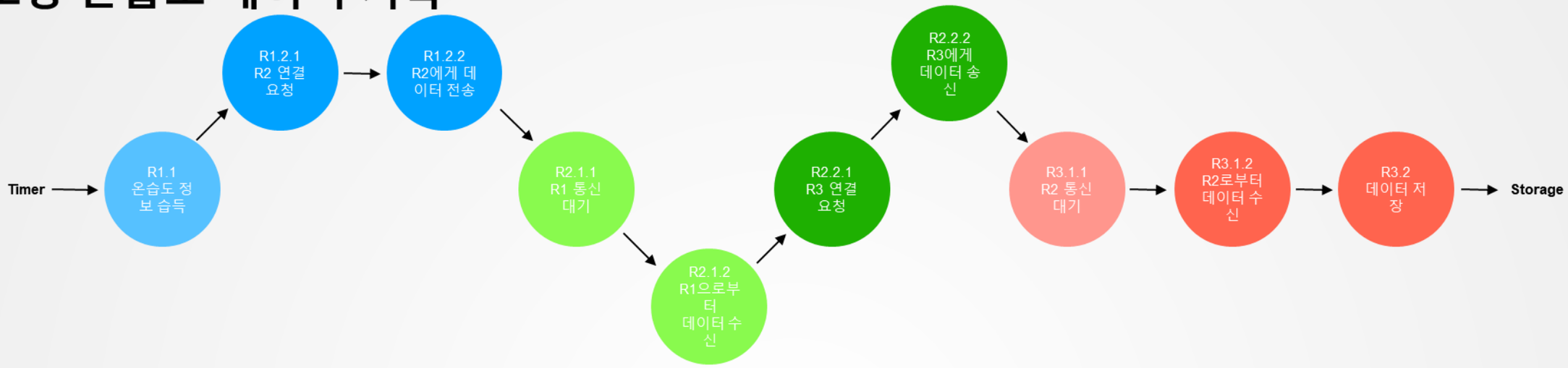



### Level 4

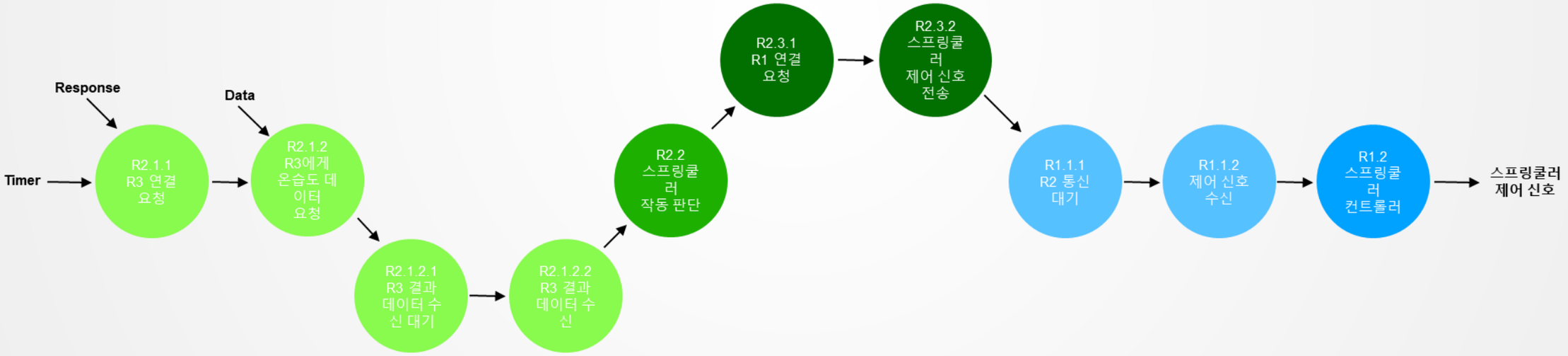


# Internal Design

## 토양 온습도 데이터 기록



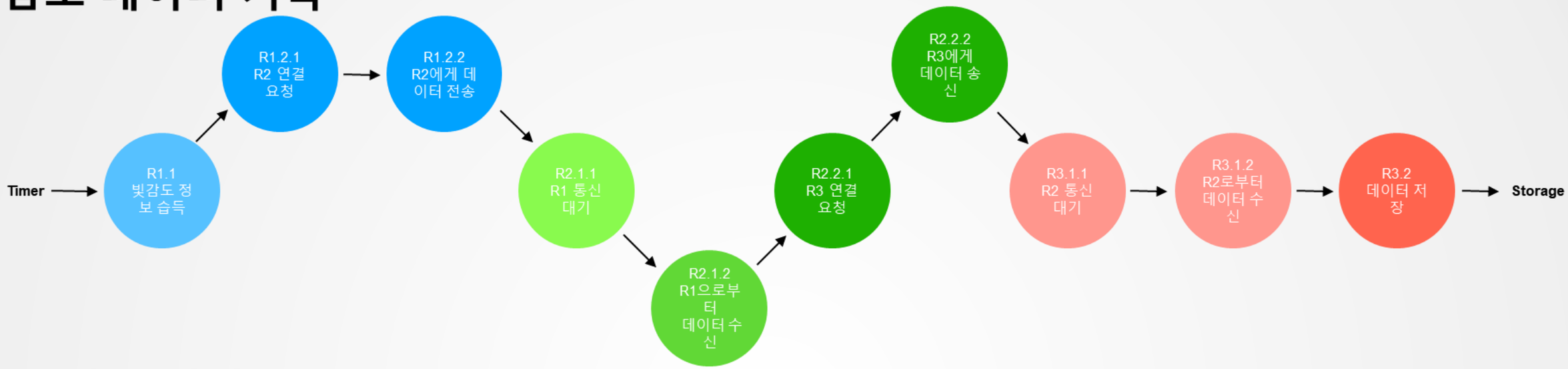

## 스프링쿨러 작동 제어



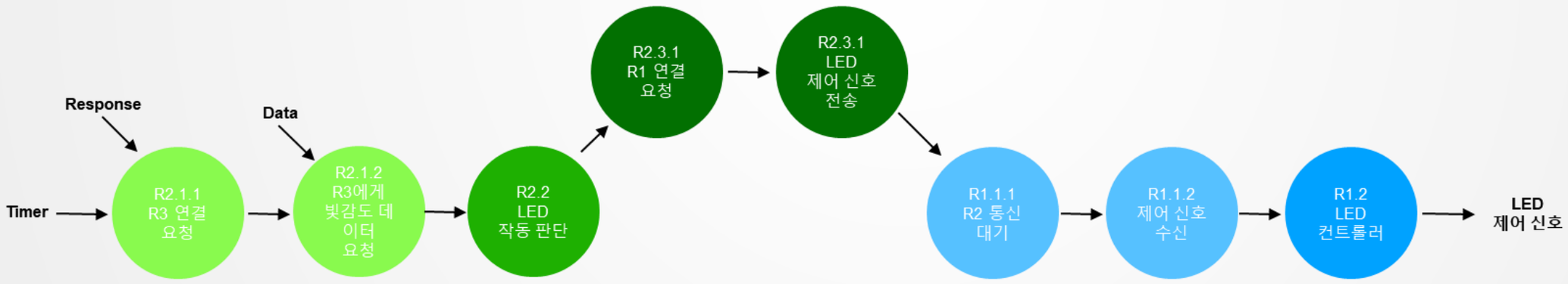

## 토양 온습도 데이터 계산

# Internal Design

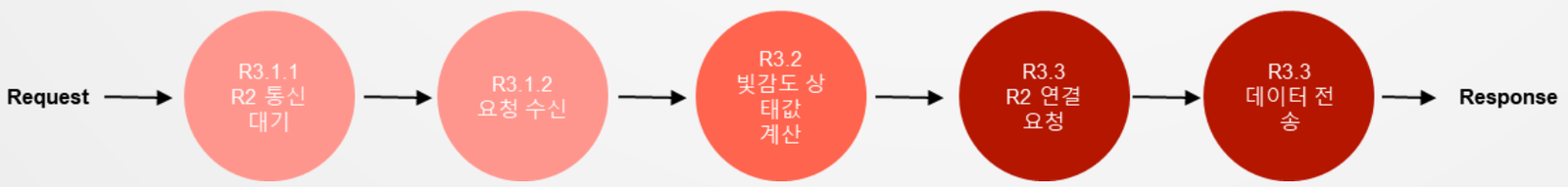
## 빛감도 데이터 기록




## LED 작동 제어

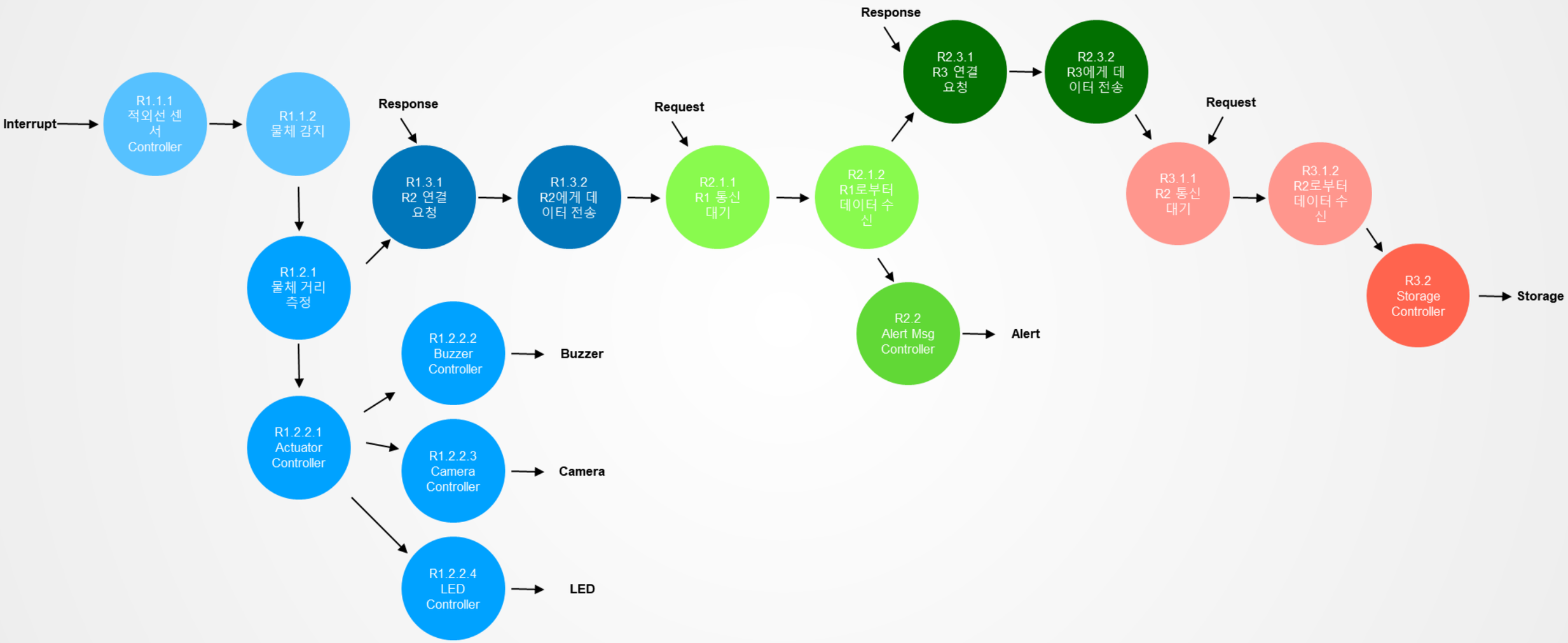



## 빛감도 데이터 계산



# Internal Design

## 미확인 물체 접근 식별 및 알림 시스템 : PIR & UltraSonic -> Buzzer & LED & Camera



# Excellence

## Works in a divided role

They work in a well-established role.

## Additional Effect

This is helpful to not only agriculture but also security and anti-fire.

## Practical

This makes us more efficient.
It is helpful.

## Over-Spec

We use 2 more new sensor than Requirements demand.

## Promising Field

Smart Agriculture is a very promising field.

## Simulate in a real model.

We simulate it in mini real-environment.

# Plan

## June, 2019

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| 26 | 27 | 28 | 29 | 30 | 31 | 01 |
| | | | Sensor / Device Coding + PPT | | | |
| 02 | 03 | 04 | 05 | 06 | 07 | 08 |
| | | | Control / Networking 구현 | | | |
| 09 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | | User Interface 및 Storage 구현 / 시뮬레이션 환경 제작 | | | 최종 점검 및 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| Document 작성 | | | | | | |

Sensor / Actuator 구현 & 각 모듈 인터페이스 정의

각 모듈 구현

통합 및 테스트, 유지 보수 / 시뮬레이션 환경 준비

최종 점검 및 Document 작성

# QnA