Smart Cradle

GROUP 10

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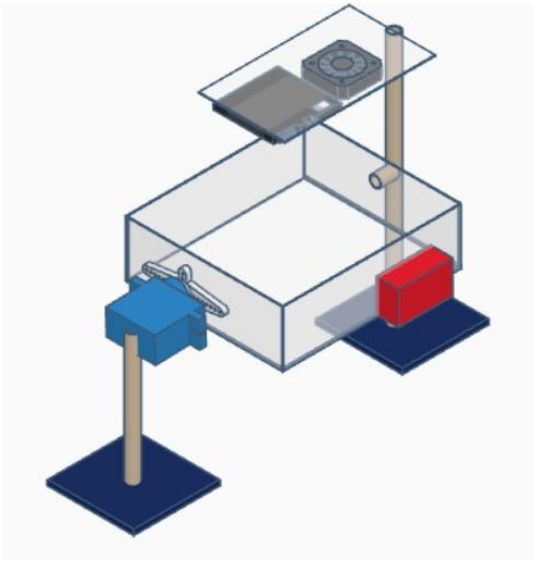
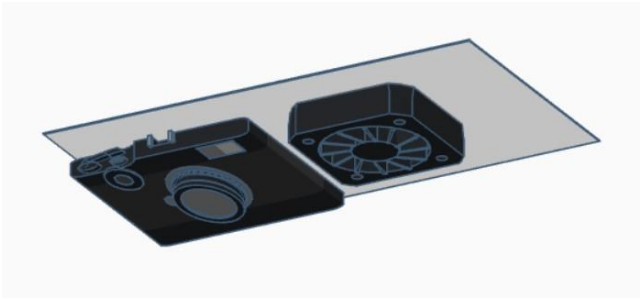
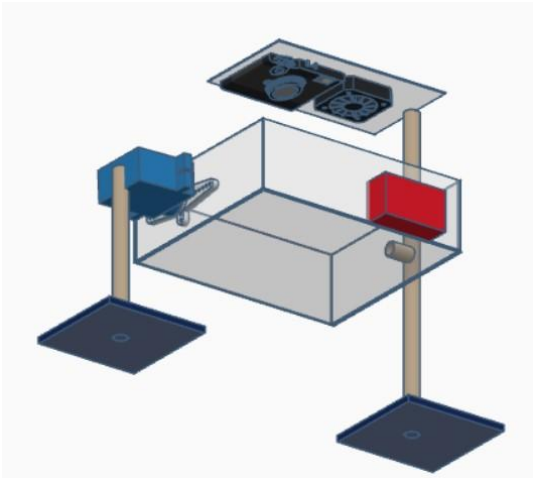
ABOUT OUR PROJECT

- Monitor the baby
- Check the room temperature
- Get Notifications
- Swing the Cradle
- Switch on the Fan
- Play Music

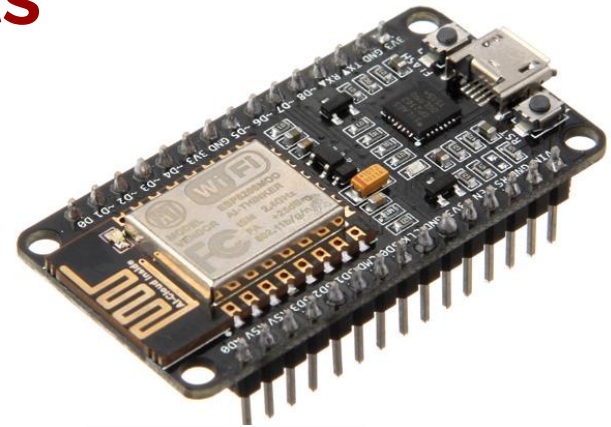


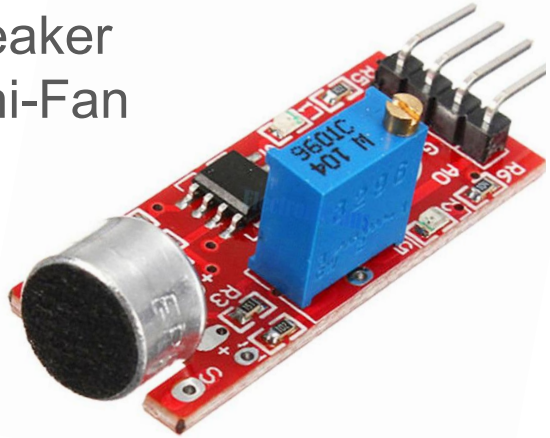


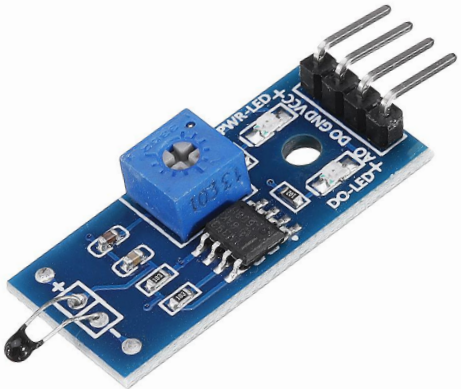


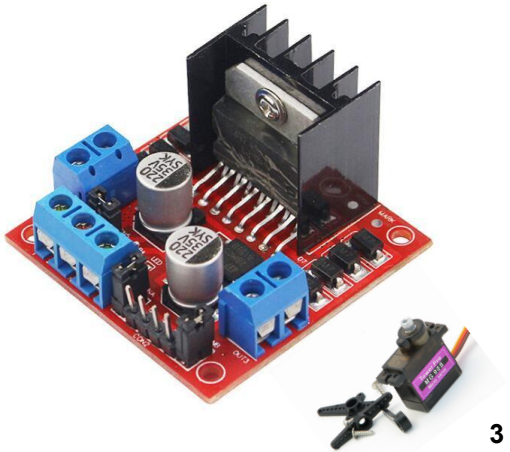
Hardware Components

- ESP 12E NodeMCU V3 module
- LM393 Sound Module
- Thermal Sensor Module
- Servo Motor
- L298N Motor Drive
- Camera Module
- speaker
- Mini-Fan



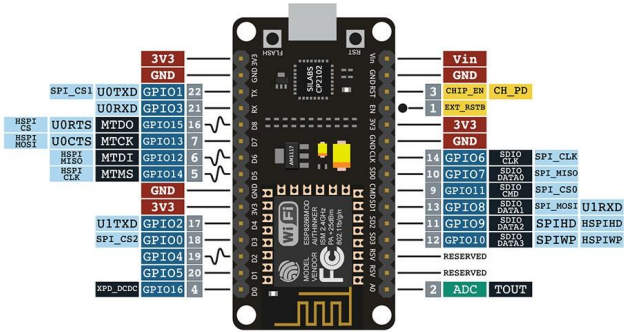






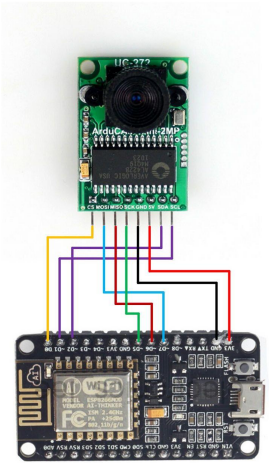
NodeMCU

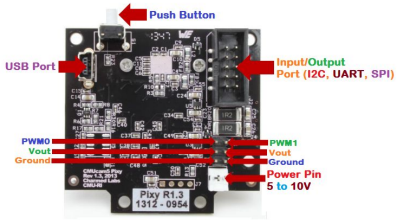
- WIFI module inbuilt
- Clock Speed: 80 MHz
- Input Voltage: 7-12V



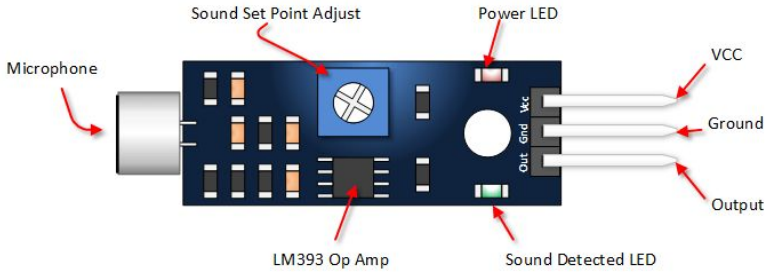
Camera Module

- Voltage: 2.5V to 3.0V
- Vision Angle: 25 degree
- Color saturation level auto adjust



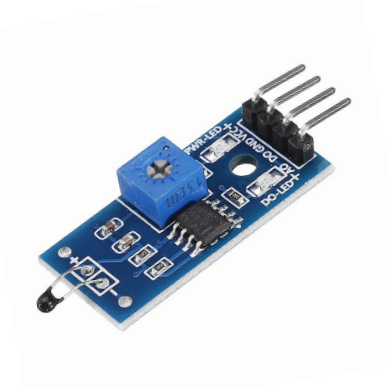


Sound Sensor



- Operating Voltage: 3.3V to 5V DC
- Operating current: 4~5 mA
- Microphone Sensitivity : 50Hz to 1500Hz

Thermal Sensor



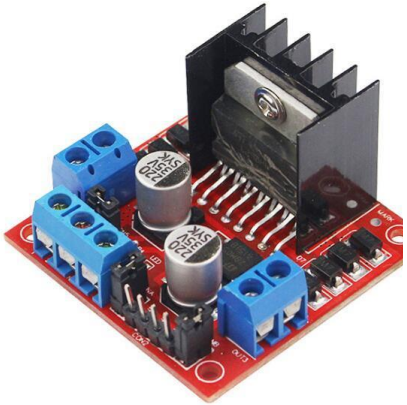
- Working voltage: DC 3.3-5V
- Can measure temperature ranging from -55°C to 150°C
- ±0.5°C Accuracy

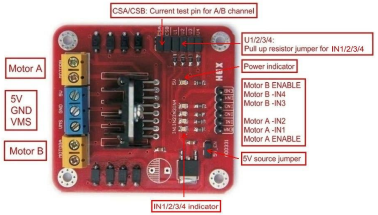
Servo Motor

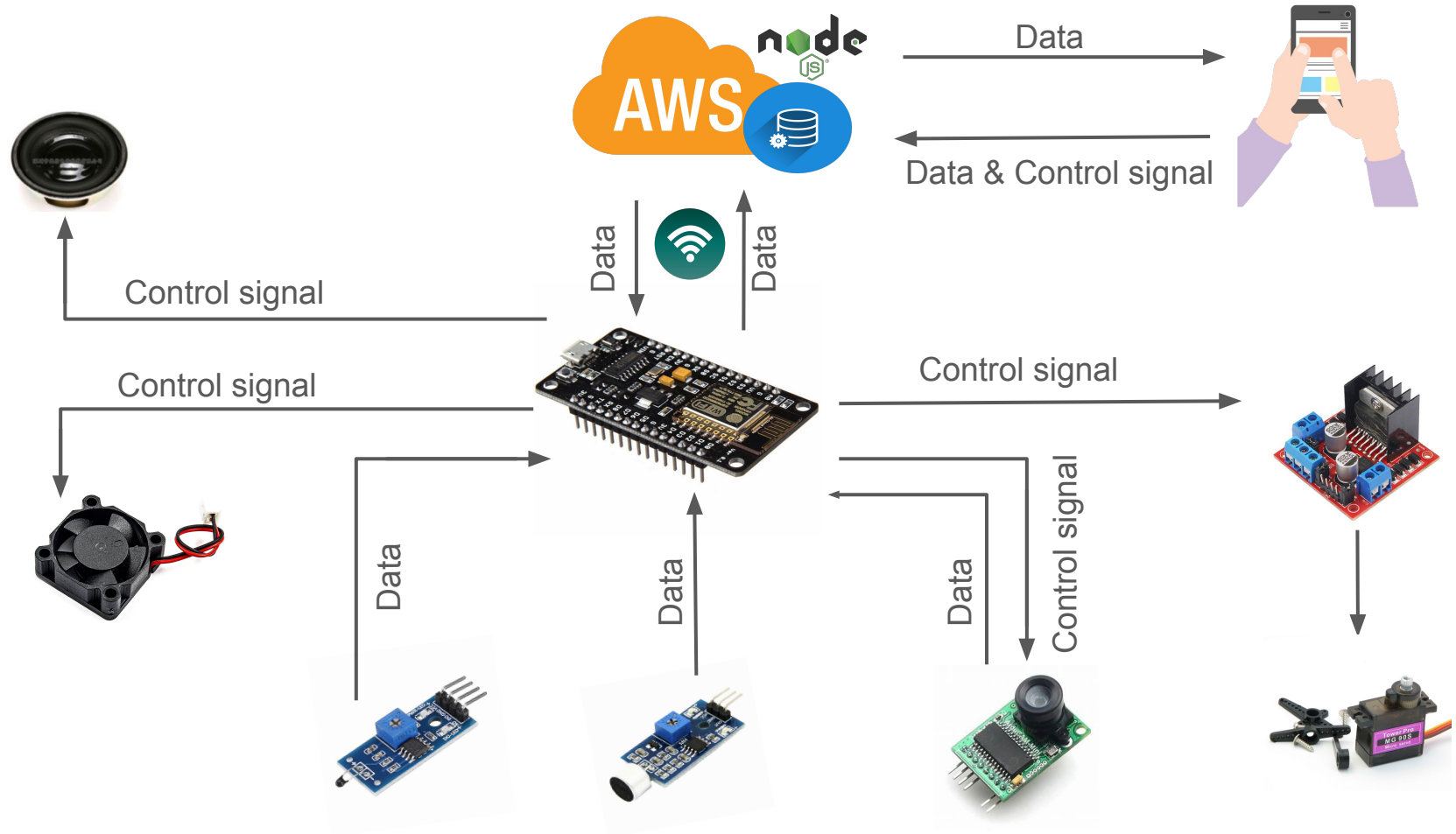
- Torque: 20kg.cm (at 4.8V)
- Working Voltage: 4.8V-6V
- Current Usage: <1000mA

Motor Driver

- Power Supply: DC 5 V - 35 V
- Operating current range: 0 ~ 36mA
- On-board +5V regulated Output supp






AWS
node
JS
Data
Data & Control signal
Data
Data
Control signal
Control signal
Control signal
Data
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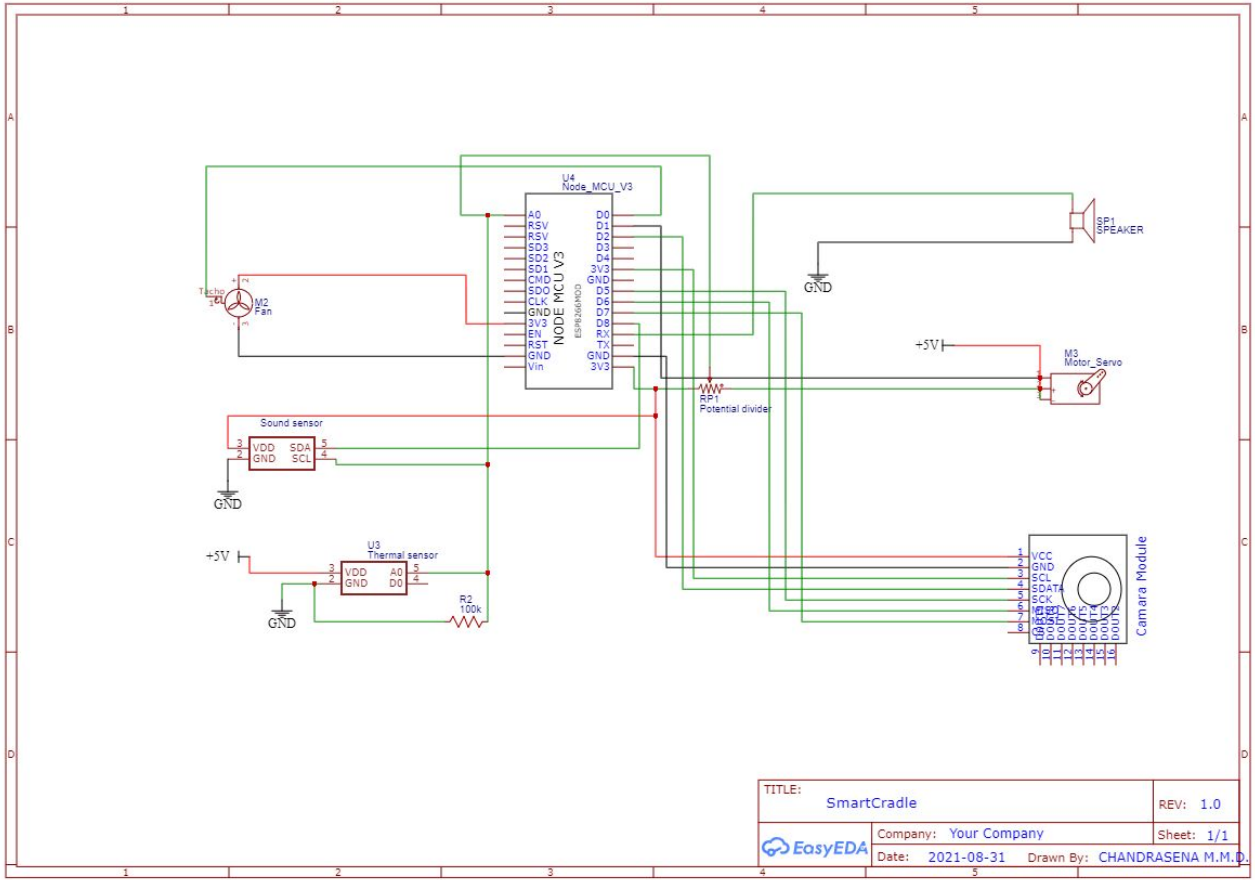
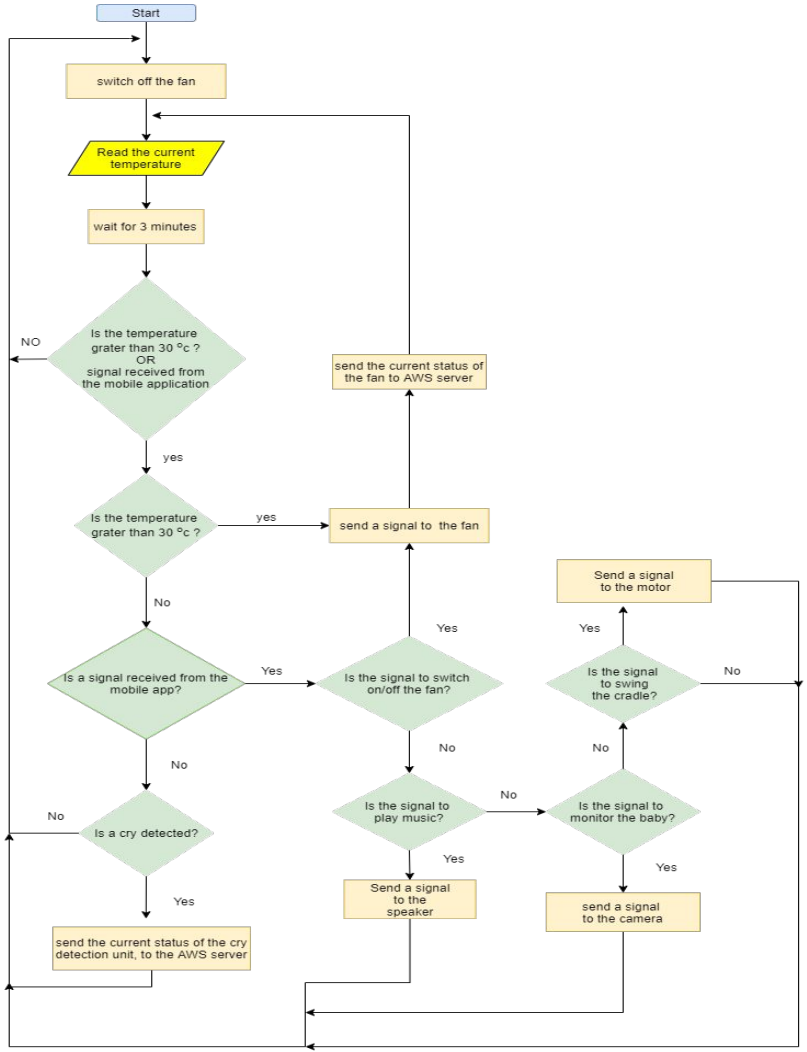
Control signal

Circuit Diagram

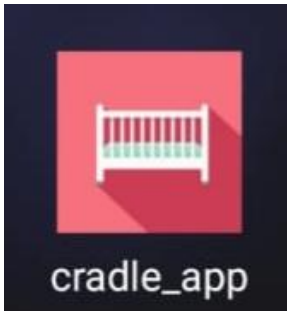


Hardware Flow Chart

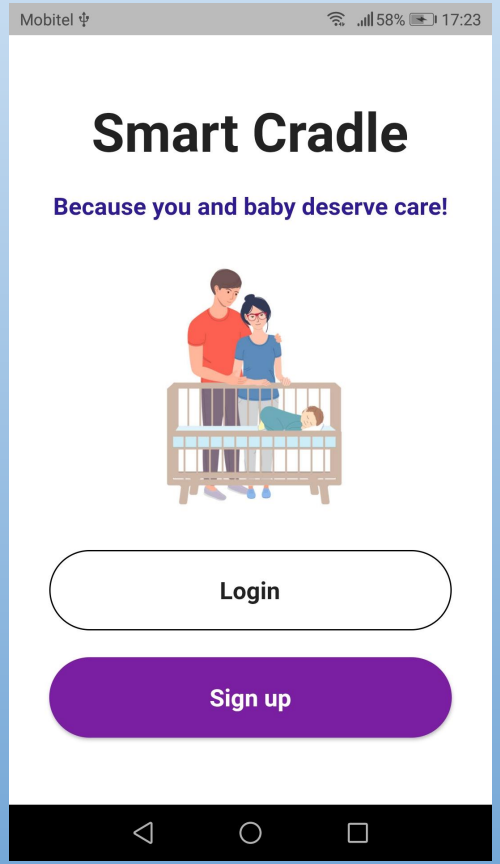


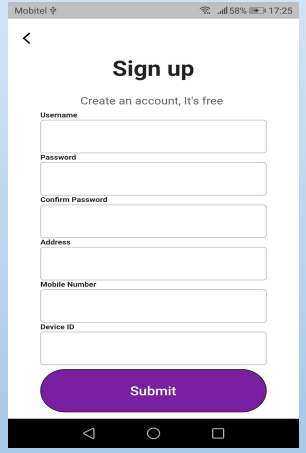
Software Development

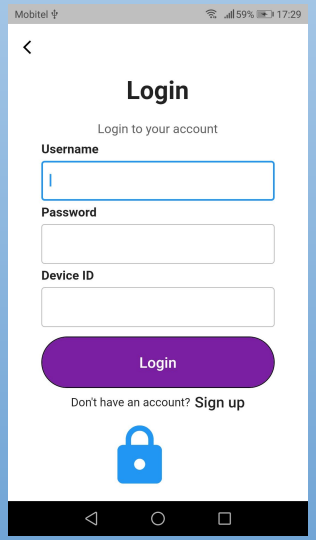
Mobile Application

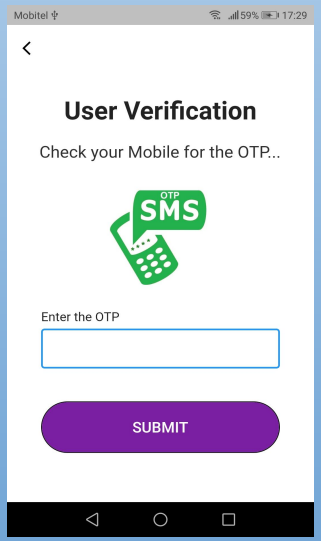


User Interfaces









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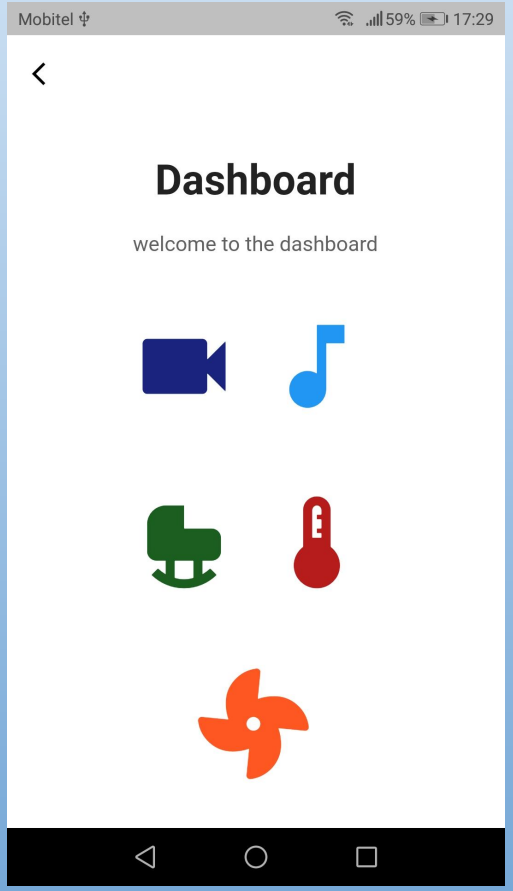
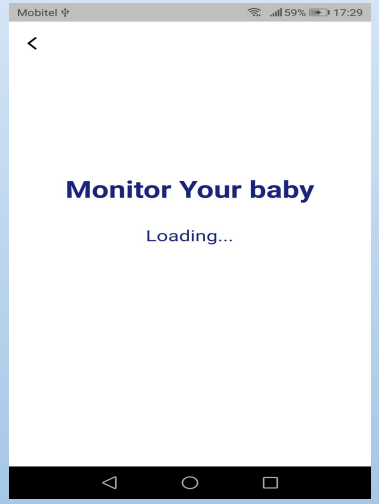
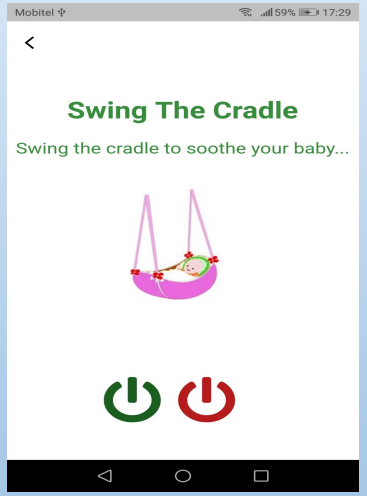
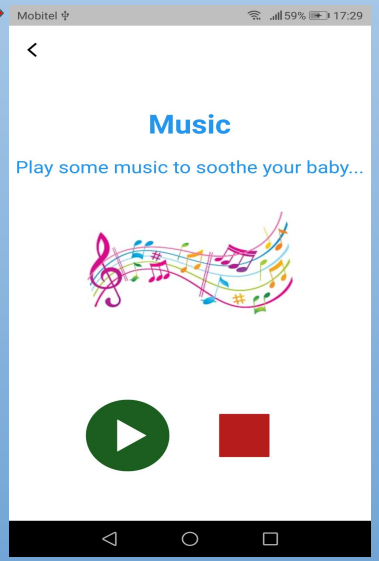
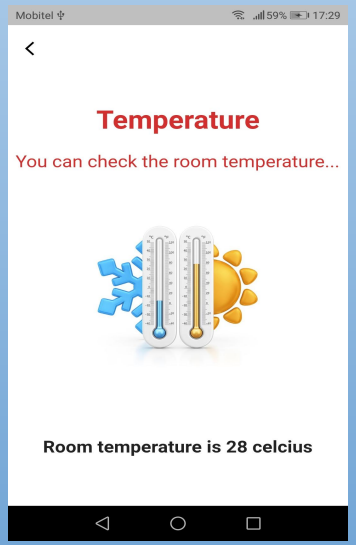










User Interfaces Progress Video

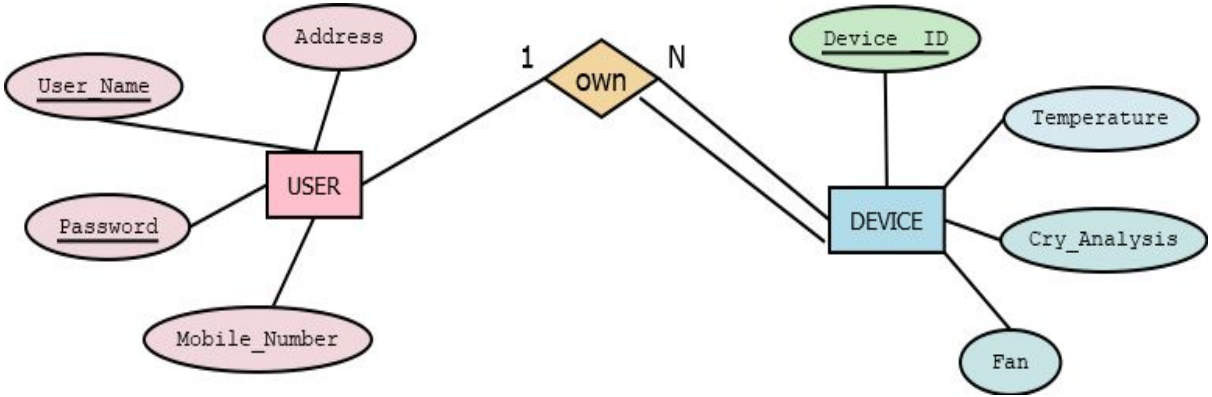
Cry Detection Notifications

Flutter

- Open Source
- No compatibility issues
- Simple and Fast
- High Performance

Flutter

ER Diagram & EER Diagram



USER

User_Name	Password	Address	Mobile_Number	Device_ID

DEVICE

Device_ID	Temperature	Cry_Analysis	Fan

MySQL

- Data Security
- High Scalability
- High Performance

NodeJS

- Fast and Highly scalable
- Large ecosystems of open-source libs

Software Testing

- **Unit Testing**

User Registrations and Logins

- **Integration Testing**

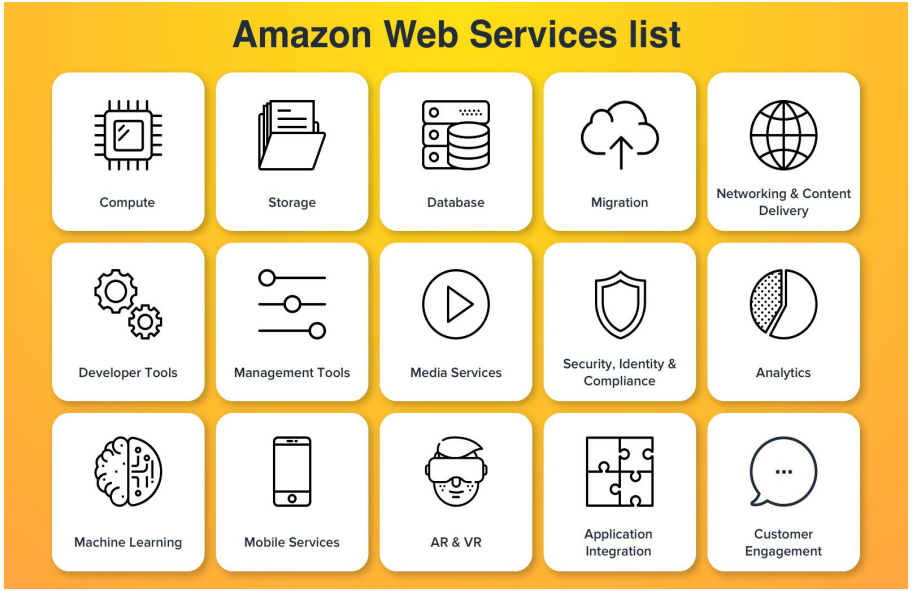
➔ Validity of the Username ,Password and OTP

➔ Updates of the Database

POSTMAN

AWS Cloud Server

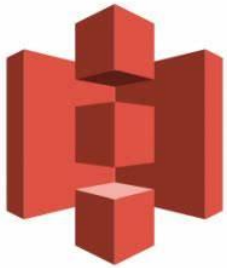
- **Virtualized computing infrastructure**
  - No capacity planning for hardware infrastructure.
  - Scalable resources
- **Secure**
  - Certificates -> authentication
  - Policy -> authorization
- **Service modules**
  - Platforms (eg: database servers , application runtimes)
  - Software



AWS storage services

Amazon RDS

Amazon DynamoDB



Amazon S3

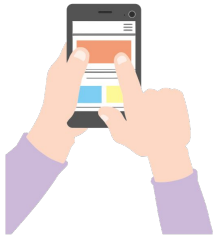
Amazon Kinesis

Amazon RDS

- Relational Database as a service
- Database engines: MySQL, PostgreSQL, MariaDB, Microsoft SQL Server, Oracle
- Easy compute and storage scaling
- Automated backups
- Encryption at rest and in transit

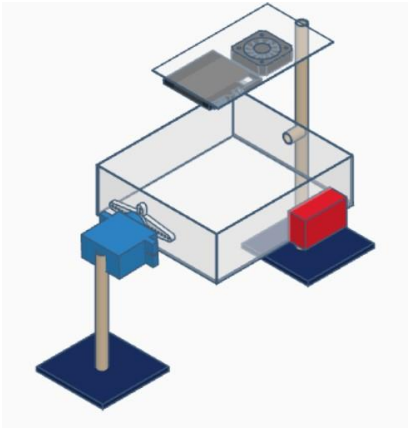
Protocols

- **MQTT communication protocol**
  - Light weight
  - Reliable
  - Event-driven (eg : publish,subscribe)



Subscribe

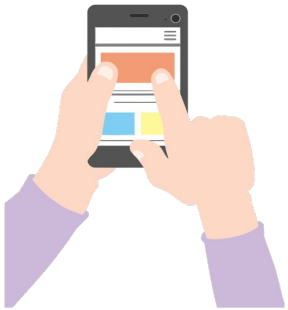
Publish



Publish

MQTT Message Broker

- **HTTPS** (Hypertext Transfer Protocol Secure)
  - **High security**
  - **Encrypted using TLS and SSL**
  - **Protects against man-in-the-middle attacks**



Security

- Use a cloud based server - AWS
- Use MQTTP and HTTPS protocols in communication
- Get username and passwords to manage user accounts
- Send an OTP to verify the user logins

amazon SNS

Budget

Component	Unit Price (LKR)	Quantity	Total (LKR)
NodeMCU	750.00	1	750.00
Servo Motor	1850.00	1	1850.00
Motor Driver	400.00	1	400.00
Power Pack	700.00	1	700.00
Sound Sensor	185.00	1	185.00
Mini Speaker	1150.00	1	1150.00
Temperature Sensor	135.00	1	135.00
Mini Fan	600.00	1	600.00
Camera Module	2950.00	1	2950.00
Other items	1000.00	1	1000.00
		Total	9720.00

Swing unit :

Rs 2950.00

Rs 1335.00

Rs 735.00

Q & A

Thank You !