Row-5

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FA22-BSE-038

SDA - Final lab

Home automation System

Architecture of Home Automation System:

Multilayer Architecture.

Data Collection layer (DCL)

DBs, user Devices, Sensors

Data Management layer (DML)

Listener ⇒ Data Storage ← Monitor

Data Acquisition

Control layer

Context operations

Aggregation, Transformation, Filtering

splitting

Service Inference layer (SIL)

Context Reasoning, Context Acquisition, Access control

Service Management layer.

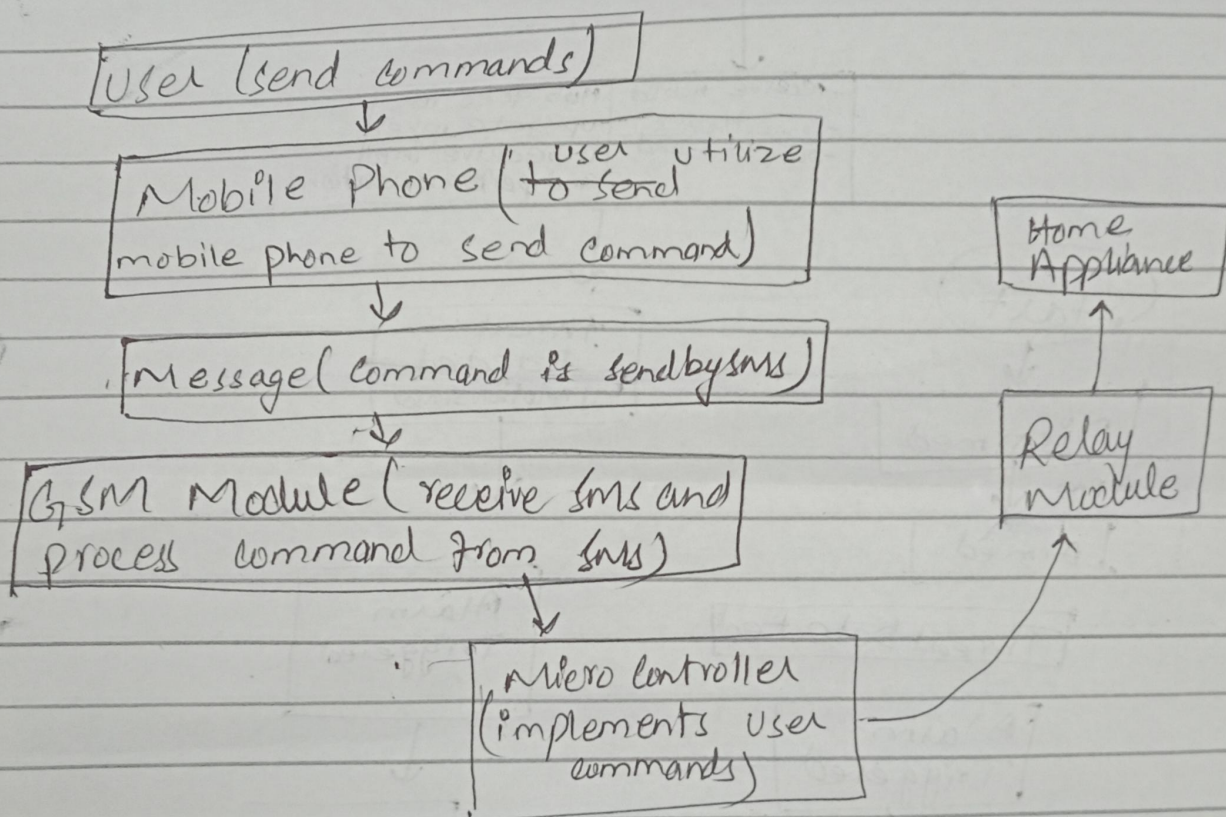Device/sensor Management   Data/service Management

Communication management.

Reference: www.ijacsa.thesai.org

Home Automation System.

Architecture Block Diagram.

User (send commands)

⬇

Mobile Phone (user utilize to send mobile phone to send command)

⬇

Message (command is send by sms)

⬇

GSM Module (receive sms and process command from sms)

⬇

Micro controller (implements user commands)

Home Appliance

⬆

Relay module

⬆

Class Diagram
Security System:

C User
- userId : String
- name : String
- authenticate() : Boolean
- send command (device: SecurityDevice, command: String) : void

↓ send command

C Hub
- hubId : String
- connect Device (device: SecurityDevice) : Boolean
- relay Command (command: String, device: SecurityDevice) : void

↓ send command

C Security Controller
- process Command (command: String) : void
- connect To device (device: SecurityDevice) : Bool
- trigger Alarm () : void

C Motion sensor
- sensorId : String
- detectMotion() : Boolean
- send Alert() : void

Security Device
- process Command (command: String) : void
- ON/OFF Camera (command: string) : Boolean
- open/close Door (com: string)

C Alarm   bool
- Alarmed (com: Bool)
- Disarm Alarm (flag: Bool) Bool

send command ↓

send Command

C Camera
- cam-id : String
- position: string
- state (command: string)

C Door
- door-id: string
- position: string
- open/close (command: string)

State Diagram:

Start ⟶ [User send command] User

[- receive hubId | Hub goes to]
[- connect Device | up state where]
[- relay command | it receive into]
[| and perform operations.]

(Start)
↓
[Disarmed]
Arm ↓
[Armed]
↓
[Threat Detected]
↓
[Alarm Triggered]
↓
Trigger Alarm
↓
[Alarm Sounding]
↓
Disarm Alarm
↓
(End)

[Threat Detected by Motion sensor]
↓
[Alarm Triggered]
↓
[Alarm Sounding]
↓
[Disarm Alarm]
↓
(End)