Ankara Yıldırım Beyazıt University
Department of Computer Engineering

CENG 201 – Object Oriented Programming
Course Project

G09: Smart Home Automation System

Analysis Report

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1. Introduction

The Smart Home Management System aims to provide users with the ability to monitor and control smart home devices, such as lights, thermostats, and security cameras. The system allows users to perform remote operations and receive alerts, enhancing the convenience and security of their homes.

2. Requirements

2.1. Functional Requirements

2.1 Functional Requirements

Device Control: Users can turn smart devices on and off and set timers for them.
Device Monitoring: Devices can send alerts when specific events occur (e.g., motion detection).
Remote Accessibility: Users should be able to control devices remotely via an application or web interface.
User Authentication: Ensure secure access to the system for authorized users only.

2.2. Non-Functional Requirements

Scalability: The system should handle multiple devices and users concurrently.
Security: Data encryption and secure communication between devices and the server should be implemented.
Responsiveness: The system should provide real-time updates and alerts to users.
Reliability: The system should operate without disruptions and provide reliable alerts.

3. System Models

3.1. Scenarios

Controlling the Lights

Purpose: Murat wants to control the lights (turn on/off, adjust brightness).

Input: The user selects the option to control lights from the menu and chooses an action (turn on/off, set brightness).

Output: The status of the light is updated (on/off), and brightness is adjusted.

System Behavior:

When Murat wants to turn on the living room light, the system calls the turnOn() function of the Light class.

To adjust the brightness, the system calls the setBrightness() function, and the set value is displayed on the screen.

Adjusting the Thermostat Settings

Purpose: Murat wants to adjust the home's temperature.

Input: The user selects the thermostat menu and chooses the temperature adjustment option.

Output: The thermostat's temperature setting is updated and displayed on the screen.

System Behavior:

When Murat wants to adjust the temperature, the system uses the setTemperature() function of the Thermostat class.

The updated temperature information is shown on the screen.

3.2. Use Cases

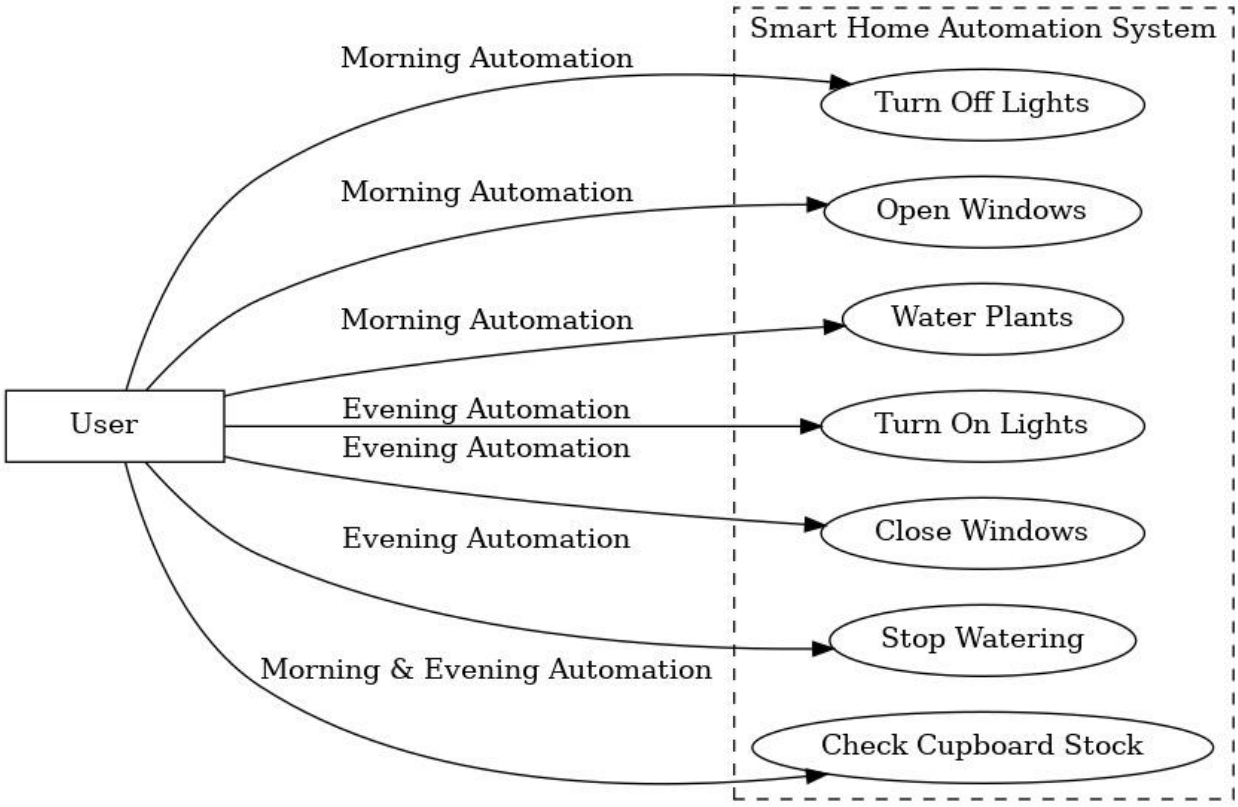

Figure 3.2- User use Smart Home Automation System

3.3. Object and Class Model

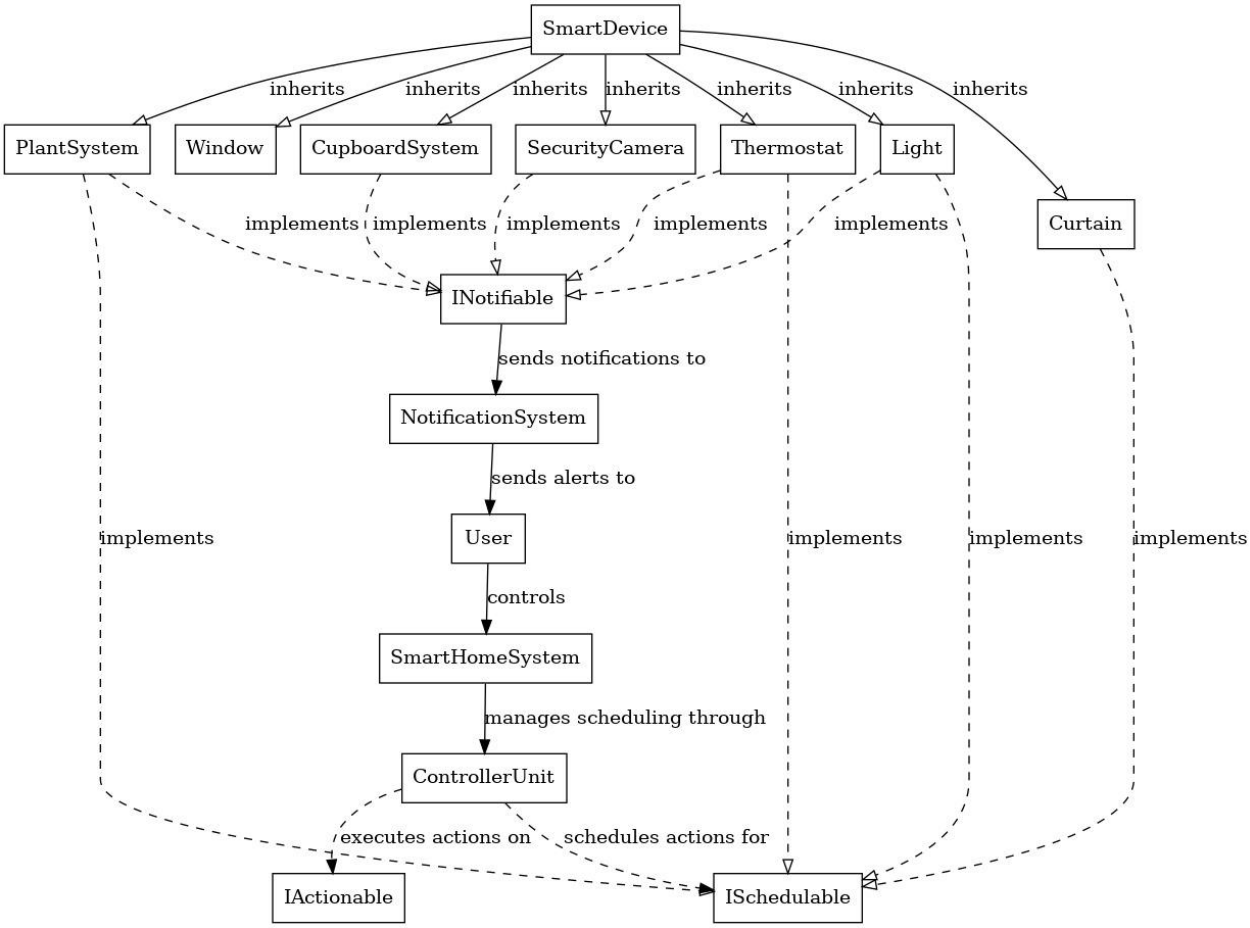

Figure 3.3 Object and Class Model

3.4. User Interfaces

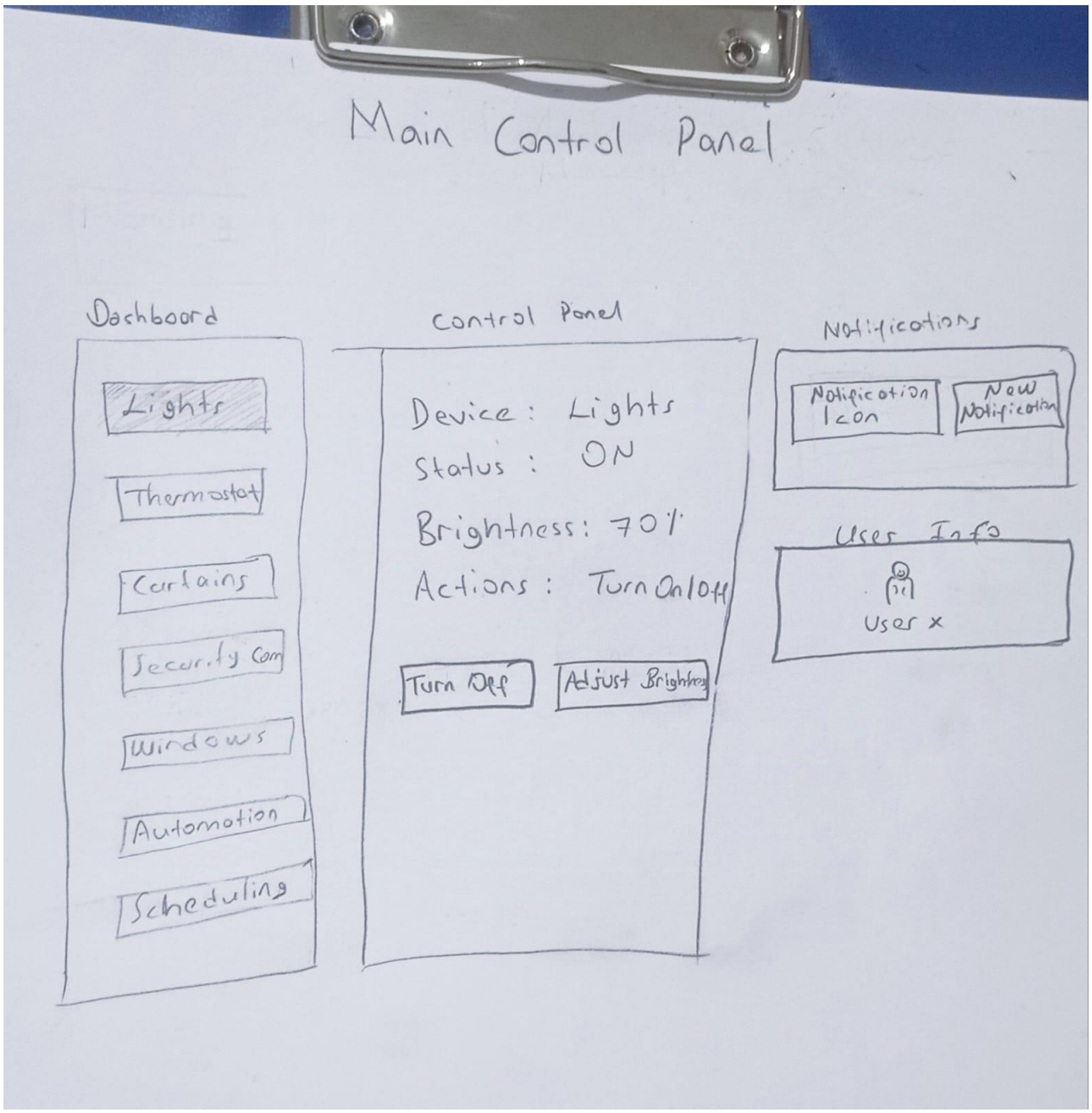

Figure 1.4.1 Main Control Panel-Lights

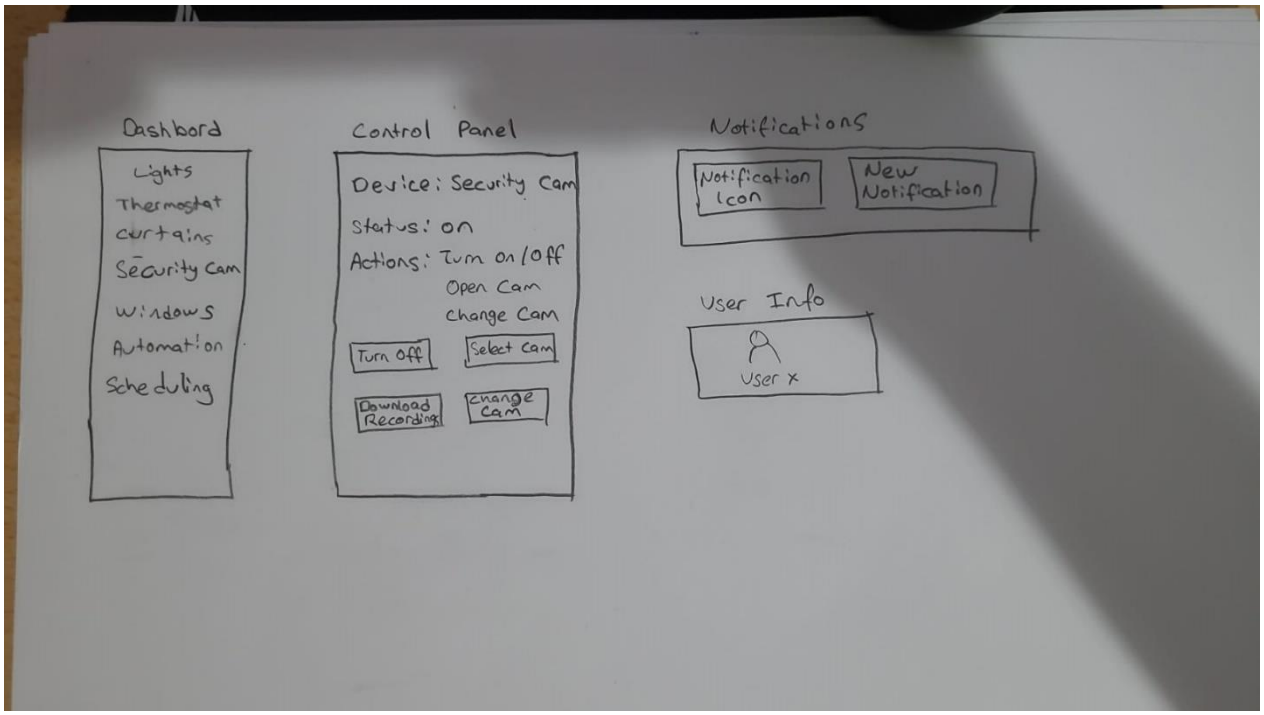

Figure 3.4.2 Main Control Panel-Security Camera

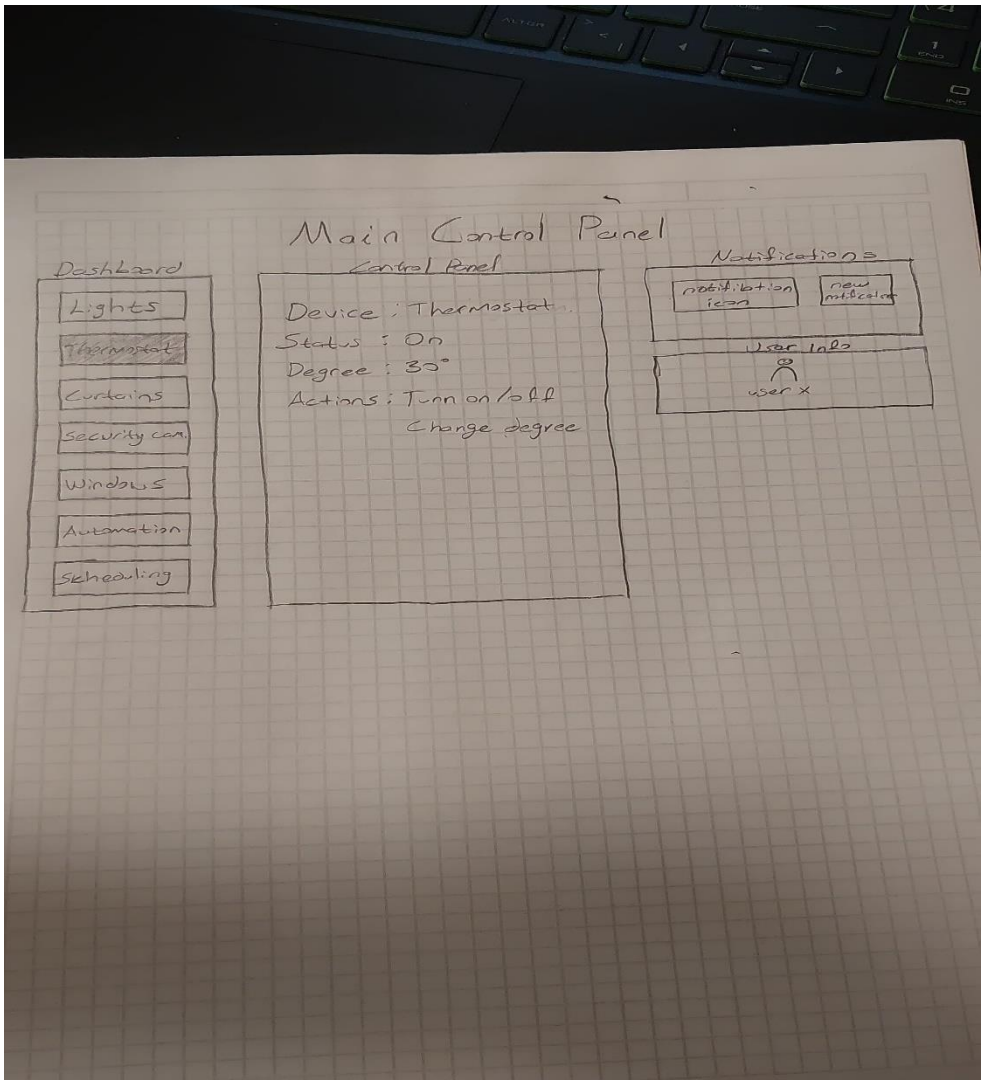

Figure 3.4.3 Main Control Panel-Thermostat

4. Conclusion

This report presents a comprehensive look at our Smart Home Management System, designed to enhance the way users interact with their living spaces. By allowing control and monitoring of smart devices like lights, thermostats, and security cameras, our system aims to make everyday life more convenient and secure.

At the Requirements part we divide as the Functional Requirements and Non-functional requirements so we define 4 requirements for Functional: as Device Control, Device Monitoring, Remote Accessibility and User Authentication, For the non-functional part : Scalability , Security , Responsiveness and Reliability.

At the 3. Part The System Model was explained as four sections like 3.1 scenarios, 3.2 Use Cases ,3.3 Object and Class Model and 3.4 User Interfaces. Each section's details can be seen above.The Controbution of the team was equally we meet online, and we shared tasks nicely.