Smart Cafe

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1 System Introduction

1.1 Background Information

Popularity of Cafes has increased in recent years. Cafes have limited seating arrangements and people sit in them for longer duration. The customer visiting times for them are unusual and not like restaurants, as restaurants only get people during lunch and dinner time only.

1.2 Problem Statement

Traditionally, the lights in a cafe are turned on always, same is the case with ventilation or heating systems. It leads to wastage of energy resources. A person has to constantly count the number of free spaces available and update the inlet sign at the door accordingly, this takes a time because of counting again and again. Also, the quantity of staff has to be increased to cater for these needs, as some has to count the customers, some has to turn on/off the lights, and some has to adjust the temperature. So the management of human and energy resources gets difficult and majority of the resources are wasted usually, which increases running cost. Likewise, the cafe manager has to manage all the persons and tasks. Furthermore, the manager or owner cannot get real time notifications of the things that are happening around in the cafe.

1.3 Project Goals

Our project aims to embed the concept of smart cities and Internet of things into a cafe, this would be realized by inclusion of smart sensors and actuators in the building. It would automate major processes of the cafe without or limited involved of humans and help the manager in saving human and energy resources easily. Further, it would add some extra features that would increase the ambiance of the cafe and proper management by using real time status of the different sensors installed in the premises.

2 System Analysis

2.1 Functional System Requirements

User Story: Smart Cafe

As a: Cafe manager
I want to: know the number of customers in the restaurant at the moment
So that: I do not appoint a person to keep the record of number of customers visit each day

As a: Cafe manager
I want to: Know the temperature and humidity
So that: I can control heating and cooling to save energy and maintain comfortable environment for our customers.

As a: Cafe manager
I want to: Control the lights
So that I: Can save energy and electricity bills by turning it off when it's not needed

As a: Cafe manager
I want to: Know which customer needs assistance
So that: I hire fewer waiters to find out who's calling from where

As a: Cafe manager
I want to: Control the intensity of lights
So that: I can set the mood, tone and ambience of the place to comfort customers

2.2 Non-Functional System Requirements

As a: Cafe manager
I want to: Satisfy my customers with the quality of service and ambiance even though I will be using smart devices and IOTs.
So that: I can set the mood, tone and ambience of the place to comfort customers

2.3 Acceptable Criteria

Given: that the cafe is opened

- Electricity should be there
- Smart IOT system should be switched on
- Internet should be working
- User has android application

When: The Cafe manager request for the sensor's information
Then: Ensure that the user gets the latest information at that time

2.4 Mandatory Requirements

- If a customer enters into the cafe, the light must be turned on
- If the temperature is high, the fan must be turned on
- The cafe should have enough seats so that the customers can sit, the counter should be correct

2.5 Desirable Requirements

- If a customer enters into the cafe, the notification that the light is turned on can be delayed
- The waiter should reach the customer as soon as the button is pressed
- The intensity of the lights should be changed when angle (potentiometer) is adjusted
- Customers get satisfied with the overall experience of the smart cafe

3 System Architecture Design

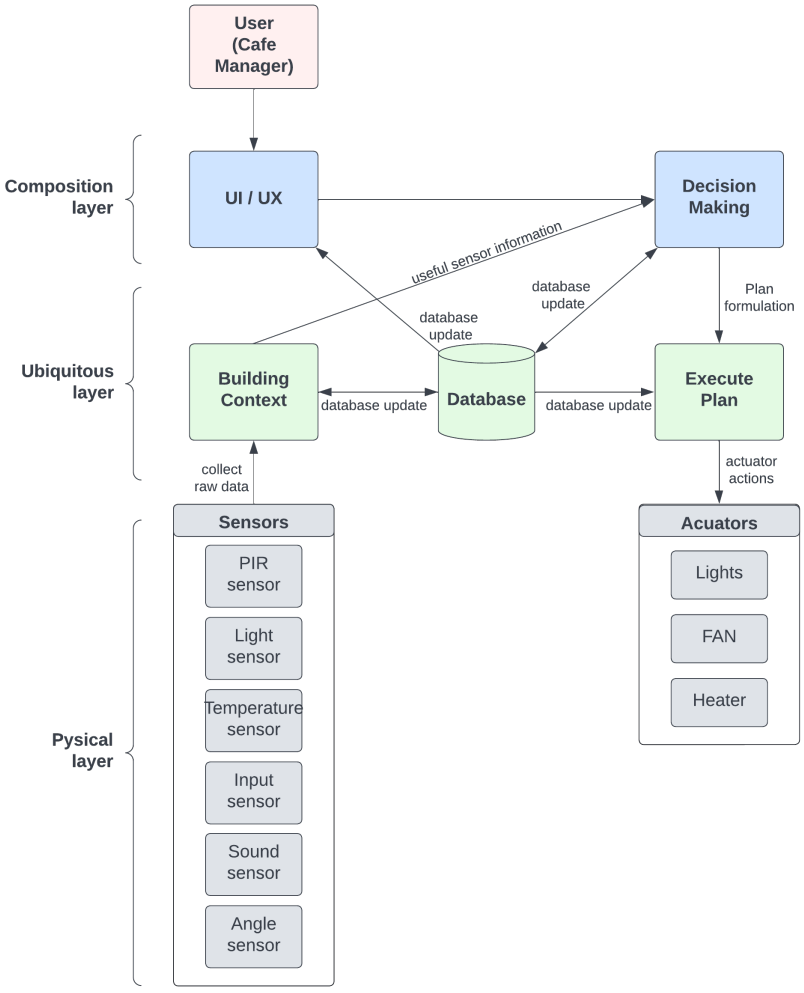

Fig. 1. System Architecture Design of Smart Cafe