**IST 659: Data Admin Concepts And Database Management**

**Project Proposal: Smart Home Automation System**

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**Business Description:**

The project aims to revolutionize the way homeowners manage and interact with their smart home devices. We are developing a Smart Home Automation System that centralizes device control, automation, and monitoring into a user-friendly platform. Our goal is to enhance the convenience, energy efficiency, and security of homes through intelligent automation.

**Problem Statement:**

With the proliferation of smart home devices, homeowners often face challenges in managing and coordinating these devices effectively. Users need a unified platform to control and automate devices seamlessly. Current solutions lack the ability to provide a centralized control system for diverse smart devices.

**Proposed Solution:**

We propose the development of a Smart Home Automation System with the following features:

* **User Management**: Allow users to register, create profiles, and manage their smart homes.
* **Device Integration**: Support a wide range of smart devices, including lights, thermostats, cameras, and sensors
* **Device Control**: Enable users to control devices individually or in groups
* **Automation Rules**: Allow users to create custom automation rules based on triggers and actions.
* **Event Notifications:** Provide real-time event notifications (e.g., motion detection, door openings)
* **Energy Efficiency:** Offer insights into device usage patterns to help users optimize energy consumption
* **User-Friendly Interface**: Develop a responsive and intuitive user interface for web and mobile devices

**Target Users:**

Our Smart Home Automation System is designed for:

* Homeowners and renters with smart home devices
* Individuals looking to enhance energy efficiency and security in their homes
* Tech-savvy users interested in home automation.

**Entities and Attributes:**

* **Users:**

User Id (Primary Key)

Username

Password

Email

First Name

Last Name

Phone Number

* **Houses:**

House Id (Primary Key)

User Id (Foreign Key)

Address

City

State

Zip Code

* **Rooms:**

Room Id (Primary Key)

House Id (Foreign Key)

Room Name

* **Devices:**

Device Id (Primary Key)

Room Id (Foreign Key)

Device Name

Device Type

Manufacturer

Model

Serial Number

Purchase Date

Firmware version

* **Device States:**

State Id (Primary Key)

Device Id (Foreign Key)

Timestamp

State Data (JSON data) eg. {"status": "on", "brightness": 75}

* **Automation Rules:**

Rule Id (Primary Key)

User Id (Foreign Key)

Rule Name

Trigger Device Id (Foreign Key)

Trigger Condition

Action Device Id (Foreign Key)

Action Command

Enabled (Boolean)

* **Event Notifications:**

Event Id (Primary Key)

User Id (Foreign Key)

Event Type

Timestamp

Message

Seen (Boolean)

A screenshot of a screen

Description automatically generated

**Entity Relations:**

* Each User can have multiple Houses (one-to-many relationship)
* Each House can have multiple Rooms (one-to-many relationship)
* Each Room can contain multiple Devices (one-to-many relationship)
* Each Device can have multiple Device States (one-to-many relationship)
* Each User can create multiple Automation Rules (one-to-many relationship)
* Each User can receive multiple Event Notifications (one-to-many relationship)

**Conclusion:**

Our Smart home Automation System Database project aims to create a comprehensive solution that simplifies smart home management and enhances the living experience. By centralizing control, providing automation capabilities, and delivering real-time notifications, we intend to empower homeowners to make the most of their smart home devices while promoting energy efficiency and security.