SECP1513-03 TECHNOLOGY AND INFORMATION SYSTEM

Proposal Topic: Home Automation System

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1.0 Client Background

In this era of science and technology, technology has become a part of our daily lives, becoming indispensable even for daily tasks such as sleeping or eating. Thus, a home automation system has become a necessity for every family in this era. Specifically tailored for families where instances of forgetting to turn off appliances like air conditioners or TVs are common, this system enables them to remotely control their electronic devices through their mobile devices, regardless of the distance. This is just one short example of how this system can help each family, and it will consist of many benefits that, in the end, enhance overall happiness and generate cost savings for every family.

2.0 Existing Technology / Tool / Method / Solution / System Used by the Client Summary

The client currently employs a mix of standalone smart devices, such as smart thermostats, security cameras, and lighting controls. These devices are controlled by individual applications and lack a centralized system for seamless automation and monitoring.

SmartThings by Samsung is a powerful smart home app that uses Zigbee and Z-Wave for efficient device communication. The core is the SmartThings Hub, connecting various devices. Users easily set up custom scenes and rules. Cloud services enable remote access.

SmartThings solves interoperability issues between different smart device brands, offering a unified control experience. As a central hub, it eliminates the need to switch between multiple apps. Automation enhances home intelligence.

It serves as a central IoT component, supporting remote control via cloud services. Open APIs boost system customization. Through smart rules and scenes, users achieve intelligent interactions, making the entire home more responsive.

3.0 Problem with existing Technology / Tool / Method / Solution / System Used by the Client

Home automation systems which are an element of IOT have made multiple enhancements in terms of security, energy efficiency and many more. However, just like any other technology this system also has its own problems.

3.1 Privacy risks

The risk of privacy breaches of devices increases as the interconnections between devices become higher. Since the existing system may collect sensitive data of users' activities and addresses it may lead to unauthorized access.

3.2 Insufficient features and functionality

The existing home automation system needs multiple applications to control everything in our house which may cause cost inefficiency due to the purchase price of multiple applications and also very big data storage in our devices. This also causes some people to be confused easily since there are too many control apps to handle.

3.3 Compatibility with existing tools

There may exist some older infrastructures in homes such as television, air conditioners and refrigerators which are not easily integrated into the home automation system. The limited standardization may cause redevelopment of older homes to accommodate smart devices.

3.4 Stability and energy consumption

Home automation system solely depends on the Internet connection. Hence, if any disruption occurs it may lead to system downtime. Moreover, this system leads to power wastage since some devices consume energy even when not in use.

4.0 Proposed Idea / Solutions to Overcome the Problems

4.1 Solutions to privacy risks:

（1）Enhanced data encryption: Ensure that all collected user data is processed with strong encryption to prevent unauthorized access.

（2）Anonymized data: Where possible, user data is anonymized to minimize the risk of potential privacy breaches.

（3）User consent mechanism: Implement an effective user consent mechanism to ensure that users fully understand and agree to the privacy policy before using the system.

4.2 Solutions to Inadequate:

（1）Integrated platform: Design an all-in-one home automation platform that works with household appliance brands to integrate various devices into a single app, allowing users to control all their smart devices from a single interface.（For example, a control app）

（2）Multifunctional applications: Ensure that home automation applications have a wide range of features, including timed tasks, scenario Settings, and custom rules to meet the different needs of users.

4.3 Solutions to Compatibility Problems: :

Adoption of common standards: Drive the adoption of common standards in the home automation industry to ensure seamless integration of devices from different brands and models.

4.4 solutions to Stability and energy consumption:

（1）Automatic processing of network disconnection: Increase the function of the device in the state of no network connection. If the Internet is interrupted, it can automatically operate according to the user's own habits to ensure that the device is carried out as usual, and no additional waste of resources will be generated.

（2）Intelligent scheduling: The intelligent scheduling system is introduced to optimize the use time of the equipment according to the habits and schedules of the family members, and the monitored energy consumption is summarized and reflected to the user, so that the user can better manage the high-energy equipment, reduce the load of the system during peak hours, so as to improve stability and reduce energy consumption.

5.0 Benefits/ Advantages from the Proposed Idea / Solutions

The benefits that we gained from using the solutions mentioned is that the user doesn't need to switch between apps to control different things in their home, the user can access multiple functions using only 1 app. It is convenient for the user since the solution can reduce the effort needed to find multiple app when needed .Besides that, it saves phone battery since there is only 1 app running in the background instead of multiple app which causes the phone to heat up quickly. Combining multiple app into 1 app also means the app can share the data more efficiently and increase the proficiency in managing the system.