Vision Document  
[SmartHome+ : A Smart Home Platform]

# Introduction

The purpose of this document is to outline a vision for SmartHome+: A smart home platform that encompasses a wide spectrum of ideas and concepts about intelligent living. The document addresses the following:

* Identify and agree on the essential needs and expectations of end users from SmartHome+.
* Mapping the identified needs to implementable features within SmartHome+.
* Analysing the current market dynamics and researching some already existing offerings in the domain of Smart Home Automation Solution.
* Propose some new off-the-self distinctive features currently missing in general within other existing products in the market.
* Identify limitation and assumption for proposed solution.
* Identify stakeholders and users.
* Identify the user environment.

The scope of this document is limited to user needs, environment, and desired solution.

# Positioning

## Problem Statement

|  |  |
| --- | --- |
| The problem of | * Disconnected devices and appliances * Unmonitored In-Home environment (temperature, air, and water quality) * Unmonitored In-House energy consumption * Home safety against unforeseen situations. * Decentralized media and entertainment devices. * Mundane day to day household activities. |
| Affects | The home residents:   * Adults * Children * Senior members * Pets |
| The impact of which is | * Time and effort wastage over repetitive tasks * Risk for home residents in the event of some exigency like flood, fire or intrusion. * Losing more money in bills due to inefficient energy usage * Losing out on a more comfortable and smart lifestyle |
| A successful solution would be | Offers its users an automated and intelligent lifestyle in terms of their daily household routine by focussing an improving over the following six dimensions:   * Accessibility (an easy to use solution) * Environment Monitoring (better living conditions inside house) * Energy efficiency control (optimized energy utilization) * Enhanced security * Improved Media and entertainment experience * Automation of mundane household tasks |

## Product Position Statement

|  |  |
| --- | --- |
| For | Home-Residents |
| Who | Are finding it hard to manage, monitor and synchronize a variety of devices and automating daily tasks. |
| The [SmartHome+] | Is a Smart Home Automation platform. |
| That | Enables its users to:   * Save both time and effort by automating daily routine tasks and enjoying more quality time with their families. * Monitor healthy and ambient living conditions within their homes. * Ensures efficient energy utilization to save costs on bills. * Provide safety and security measures for intrusion and other unforeseen emergency situations like fire and floods. * Provide meaningful recommendations towards optimizing their energy consumption * Synchronize various media and entertainment platforms and devices for a seamless and more unified experience. |
| Unlike | Other commercial solutions in the market that tend to support pairing capabilities to a small subset of smart devices |
| Our product | Offer a more comprehensive cost effective and more importantly an extensible solution that apart from supporting a bundled set of smart devices can also support smart devices manufactured by some third party vendors. |
|  |  |

# Stakeholder Descriptions

## Stakeholder Summary

|  |  |  |
| --- | --- | --- |
| Name | Description | Responsibilities |
| Smart Solutions Inc | The owner of the project | * Provide a high level product description * Monitors and manages the project * Finalizes different proposal * Approves budget * Provides feedback * Participate in User Acceptance Testing. |
| Users | Home-Residents who will be using the solution. | * Provide feedback and comments. * Suggest new features and modifications |
| Developers | The team responsible for eliciting requirements and developing the product. | * Requirement elicitation and analysis to come up with a Software Requirement Specification (SRS) document. * Designing, Developing and Testing the system. * Preparing documentation and user guides. * Post-delivery maintenance of the system. |
| External Smart Device Vendors | Third Party Vendors who would be manufacturing Smart devices that can easily pair with our solution | * Provide necessary device specific APIs/Interfaces that allows for a seamless device integration with SmartHome+. |

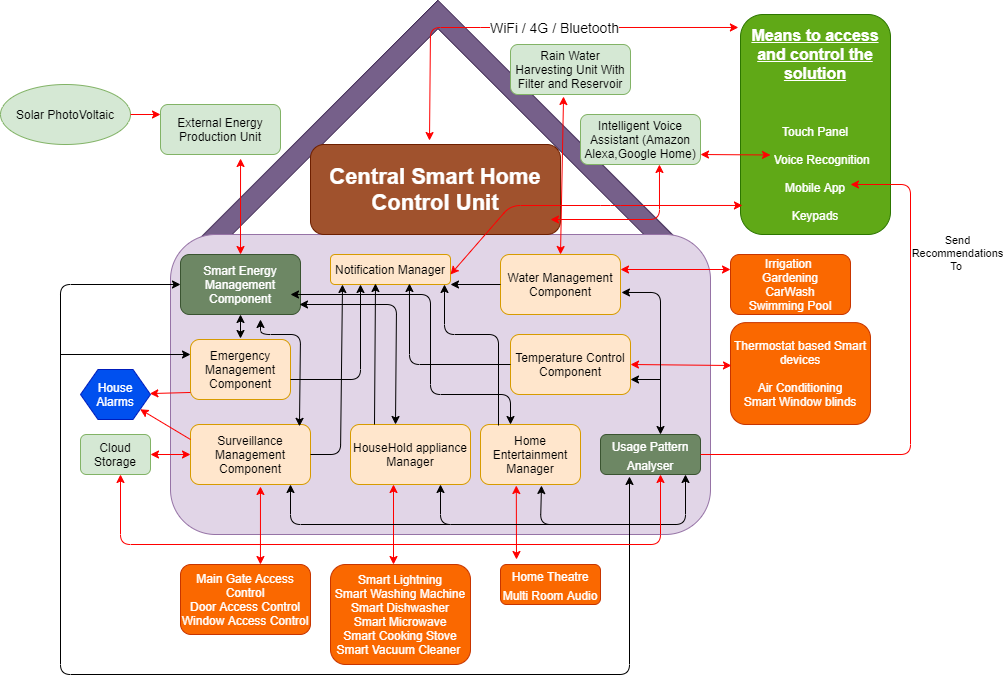
## User Environment

User can access the system both locally and remotely. Local access includes local monitors and voice-based assistants. Remote access can be achieved using Mobile/Browser app. The system is self-evolving based on the user’s daily routines; however, user also can override the system. User’s will receive notifications through email and/or SMS concerning the status of the system. System will trigger alarms and send notifications when safety is compromised (Ex: Fire, flood, intrusion).

# Product Overview

## Product Perspective

The SmartHome+ is a home automation solution which integrates various IoTs in a household through a central controller to automate daily home tasks, enhance accessibility to the IoTs, provide home security and reduce energy waste.

****

* **Central Smart Home Control Unit** comprises of various subcomponents each handling a specific dimension dedicated towards providing an overall smart living experience.
* **Smart Energy Management Subcomponent** apart from managing and optimizing energy usage also interfaces to external energy generation sources
* **Usage Pattern Analyzer** is the key component offering a Self-Evolving mode to the solution by collecting usage data from various subcomponents and trying to optimize their utility by learning patterns from the collected data. Besides it also makes meaningful lifestyle recommendations to the end users over the mobile app interface.
* **Red Colored Arrows** represent links going out from Central Control Unit to outside environment (User Interfaces, Smart Devices, Alarms, and Other Systems)
* **Black Colored Arrows** represent links internal to the Central Control Unit.

## Assumptions and Dependencies

[List each factor that affects the features stated in the **Vision** document. List assumptions that, if changed, will alter the **Vision** document.

For example, an assumption may state that a specific operating system will be available for the hardware designated for the software product. If the operating system is not available, the **Vision** document will need to change.]

|  |  |
| --- | --- |
| Assumptions | Dependencies |
| Controller and the devices are compatible with each other. | Communication between the devices and controller happens via Wi-Fi/Bluetooth |
| Internet connectivity is available for remote access. | Mobile/browser apps use the Internet to communicate with the controller. |
| APIs to control the IoTs are available | Controller monitor and control the devices using APIs |
| Environment is free from poor Wi-Fi signal, interference and signal jamming from external devices. | Controller and devices communicate via Wi-Fi/Bluetooth |

## Needs and Features

*[Avoid design. Keep feature descriptions at a general level. Focus on capabilities needed and why (not how) they should be implemented.]*

|  |  |  |  |
| --- | --- | --- | --- |
| Need | Priority | Features | Planned Release |
| *[State a need]* | *[Set priority:*  *High, Normal, Low]* | *[Name the feature]* |  |

## Alternatives and Competition

[Identify alternatives the stakeholder perceives as available. These can include buying a competitor’s product, building a homegrown solution, or simply maintaining the status quo. List any known competitive choices that exist or may become available. Include the major strengths and weaknesses of each competitor as perceived by the stakeholder or end user.]

# Other Product Requirements

[At a high level, list applicable standards, hardware, or platform requirements; performance requirements; and environmental requirements.

Define the quality ranges for performance, robustness, fault tolerance, usability, and similar characteristics that are not captured in the Feature Set.

Note any design constraints, external constraints, or other dependencies.

Define any specific documentation requirements, including user manuals, online help, installation, labeling, and packaging requirements.

Define the priority of these other product requirements. Include, if useful, attributes such as stability, benefit, effort, and risk.]

5.1 Hardware requirements:

* The controller and the devices have the required hardware to enable communication using WiFi/Bluetooth.
* Controller has provision for SIM to enable 4G and WAN ports for Broadband connectivity.
* Controller is equipped with RAM and SDcard to store local information.
* Controller can connect and run on battery backup.
* Rechargeable batteries supported by the controller.

5.2 Platform requirements:

* Controller runs on LINUX and supports the JAVA environment. The firmware will be implemented in Java.
* Firmware/Software upgrades will happen over Broadband (primary) or 4G (secondary).

5.3 Performance requirements:

* 24 hours battery backup in case of power failure.
* Access to 4G during broadband failure.
* Expected latency to send and receive commands to the devices is < 1 second.
* Expected latency to receiving notifications is 1-2 seconds.
* Ability to detect malfunctioning devices and power loss.
* Expected latency between cloud server and controller is < 1 second.

5.4 Security

All transmissions to and from the controller are encrypted to ensure privacy and data integrity. Authentication modes to the system include password, voice and face recognition and only authorized users can monitor and control the system.

5.5 Standards:

Devices and controller are compliant with CE (European Conformity) and FCC (Federal Communications Commission) standards and other required local regulatory services. Additionally the product will be UL certified.

5.6 Documentation:

User manual and installation documentation are produced which instructs on recommended and safe installation and usage of the system.

5.7 Risk:

* The system will not function when there is a power failure and when the battery runs out.
* The system will not be remotely accessible in case of broadband failure and poor 4G connectivity.

Glossary:

* Controller -
* Devices -
* IoT -
* Firmware

References:

<https://www.iotas.co.uk/ce-fcc-regulatory-services/>