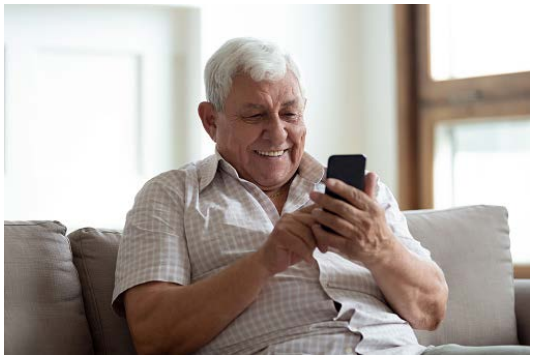
Introduction

We can't deny that technology has been an integral part of our life and right now it is a great mess to use everything peacefully without installing a ton of apps and plugins to make everything work together. Even though many of the smart gadget appliances interfaces have been a lot better than they have ever been, it is still far away from perfect to call it exactly smart if it can't work with other smart devices. Today’s focus would be to build a system meant to easen our day to day life with smart gadgets all around us. We are not talking about a certain type of technology, we are out here trying to bring everything under one roof. We are talking about an ecosystem which has an all in one interface that would support a wide variety of smart gadgets that humans use on a regular basis nowadays, be it a simple coffee machine that prepares your coffee for you every morning on schedule or be a complicated robot dog from Boston Dynamics that you might have lying around. The point is simple: make accessibility of all our smart things together in such a way that no one has to open a series of apps to do actions that should have been easier to be done in the first place since they are already paying extra for the “smart” device because if the user still has to do a considerable amount of actions to get a work done then it is not that “smart”.

Design Portfolio

User Personas - 1



Personal Information
Name: Bob Mathews
Age: 73
Marital Status: Married
Location: Glenfield, England
Occupation: Ex Royal Navy, Gardener

Bob is a well respected individual who has been settled in Glenfield since his retirement from the Royal Navy. He has a passion towards Gardening and maintains a small patch of seasonal vegetables and fruits in his backyard. He lives with his wife and a dog. He has 2 kids who have their own family and come occasionally to meet their parents. Thanks to his kids, Bob has a lot of smart home gadgets but has no idea how to utilize any of them because of the unique and hard to understand interface for each device. He is a very patient man, thanks to his earlier occupation and would like an easier and non kludgy way to use his devices so that he can make old age easier for him and his wife. He currently only has a basic smartphone that he uses to make calls and read family messages thru whatsapp.

Goals

- He wants to be more involved with technology and has enough patience.
- He wants to be more about the latest technology so that he can help himself and his wife towards a more comfortable life.
- Wants to properly start using all the smart gadgets that his kids have installed at their house for their parents ease of use.

Pain-Points

- He has only a smartphone that he brought a few years back.
- Has a lot of smart gadget but does not utilize any of the smart features
- It’s hard for him to understand all the different kludgy interfaces.
- Wants to make it easier for his wife and himself.

Needs

- Easy to use interface that can be learnt and navigated through easily
- Provide a good User Experience while controlling the gadgets

Design Portfolio

User Personas - 2

Personal Information
Name: Linus Sebastian
Age: 35
Marital Status: Married
Location: Canada
Occupation: Video presenter, technology demonstrator, advertiser & founder of Linus Media Group

Linus Sebastian is well known to the tech enthusiast community from his YouTube channel Linus Tech Tips, which is maintained under his company Linus Media Group. Starting from various tech backgrounds and workplaces, Linus established his own company Linus Media Group (LMG) out of his own garage in early 2013. Like everyone nowadays he has a lot of smart devices but is annoyed by the fact that he has to use a ton of different interfaces to make all of them work. He doesn't want to do that and would rather have an all in one interface that all manufacturers can make use of. He has spent a good considerable amount of money into his tech gadgets and is willing to spend more wherever needed. He mainly uses his desktop over mobile devices because he is a Power User and likes to have all the control over his systems. Also he likes the fact that he can get more information on a bigger screen as opposed to mobile devices. Also he has issues with security as he feels not all manufactures lays emphasis on the security aspect of their app and device which leaves a lot of security vulnerabilities open for his devices esp the ones at his house.

Goals

- Want’s an ecosystem that would work with all of his smart devices
- A single application for controlling all devices
- Wants a secure ecosystem that one can truly depend on

Pain-Points

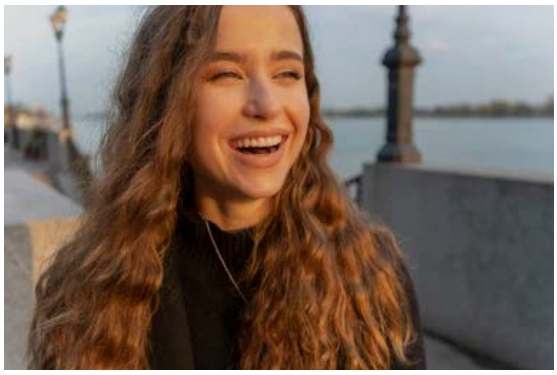
- Prefers desktop interface over mobile
- Security is a huge concern for him
- He feels as a power user there ain't much control over his devices

Needs

- Wants a good all in one ecosystem for his daily smart devices
- Prefer more granular control over his devices
- Wants a good interface for usage with his desktop
- Prefers a power user mode for his interface

Design Portfolio

User Personas - 3



Personal Information
Name: Catharine Price
Age: 23
Marital Status: Single
Location: Pennsylvania, United States
Occupation: Post Grad Student, Part time employee at a retail store, Instagram Influencer

Catharine is a young individual who much like others of her age is very much into technology. Her life revolves around social media where she spends much time sharing what she is doing at the moment with her followers. She likes to use technology to make her daily activities easier. She has been using smart home products for some while and have been very much grateful to them as they save a lot of time in her hectic schedule. However she is upset that sometimes her smart kitchen appliances wont work as intended because the app bugs out and she won't be able to do anything regarding this. She is also afraid that some devices don't have a good interface to use compared to the rest. She also doesn't like that she has to install more than five apps just to do daily tasks with her smart gadgets. She wishes to have an app that she can depend on daily without worrying about its reliability and functionality.

Goals

- Want's a reliable way to use all her smart home appliances
- Easy to use interface for her gadgets
- No more multiple apps installed on her phone to smartify her life

Pain-Points

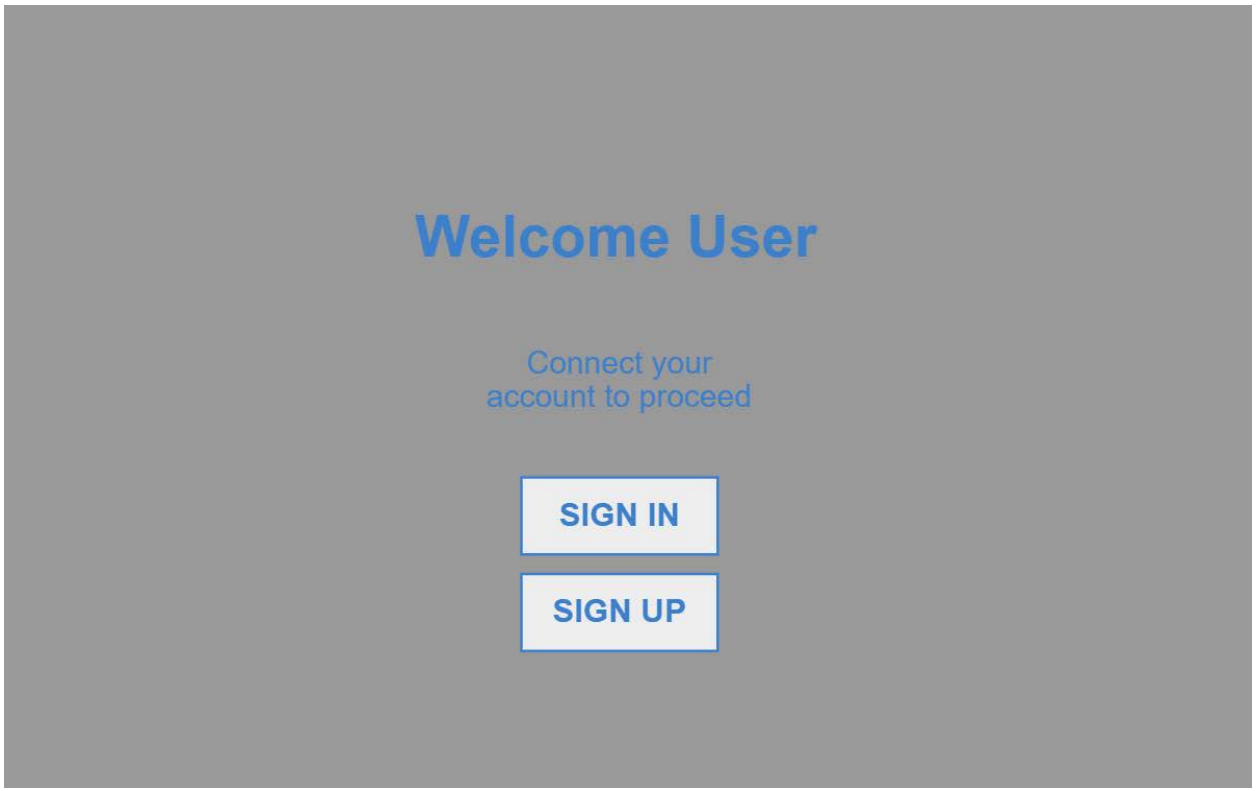
- Hate using multiple apps for controlling her smart gadgets
- Different interfaces makes life harder as they all don't provide equally good functionality
- Sometimes some devices cant be used because the app bugs out

Needs

- Wants a app that can easily work with all her smart gadgets
- Should be reliable in such a way that the user should not have to worry about not being able to use their gadget
- Reduce app clutter while at the same time keeping an easy and useful interface that provides all the needed functionality.

Design Portfolio

Wireframes (Medium-fidelity Prototype)



Welcome Screen during first load up

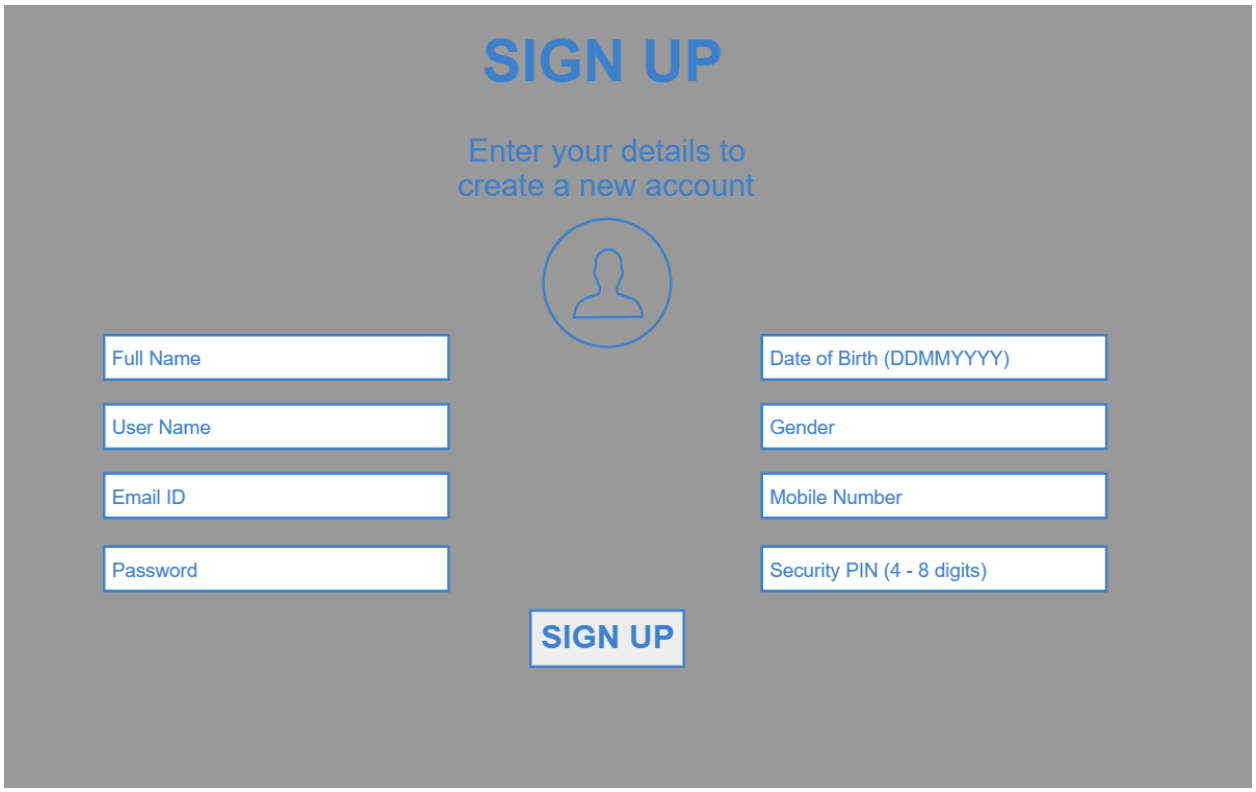
This screen helps the users to do their account registration so that they can sync in their pre existing setup using their account or if they are new create a new one. This is needed so that the user can always have backup of their settings, devices and customizations that are unique to each user. Interacting with the button “Sign In” takes the user to a Sign In page where they can log in into their existing account and sync all their data. “Sign Up” button takes the user to a screen where they are asked to fill in their required details that will be needed for the creation of an account. The accounts are designed to store all their data on fast and secure cloud based servers which are very reliable and flexible.

Design Portfolio

Sign In Screen

This screen prompts the user to log in into the existing account that they have created at some time earlier. The user can enter their email id or their unique user name along with their secure password to get access to their account and sync all their preferences. We also have an option to keep the user signed in locally at the device. This is useful when you are out but still wanna access your services but don't wanna store your credentials on your friends or public devices.

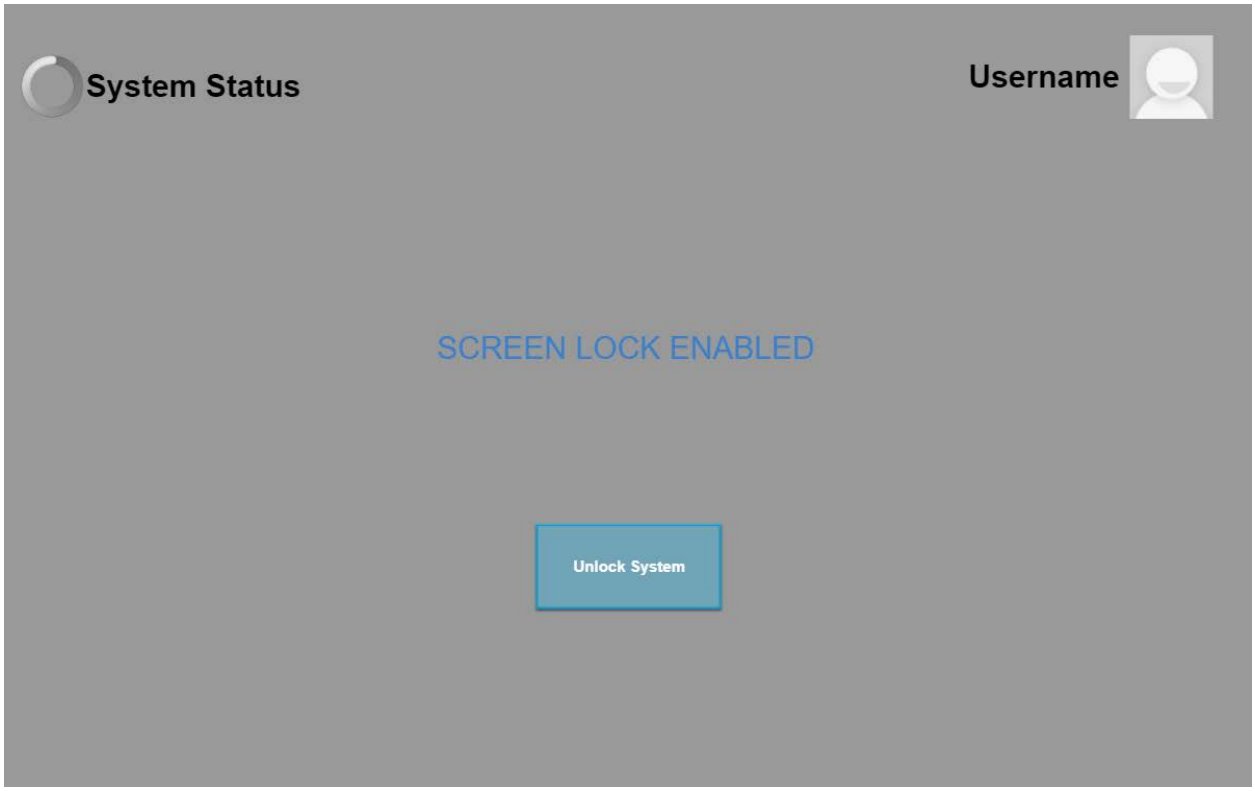
Design Portfolio



Sign Up Screen

This screen prompts the user to create a new user account that will be used to sync all the users customized data. The user needs to input his Full Name, his unique username,Email ID and secure password.Along with that for extra security and features we also do ask details such as Date of Birth, Gender, Mobile Number and a Unique Security PIn. The DOB & Gender will be used to improve the AI suggestions given to the user. The Email ID and Mobile number will be used to contact the user incase of any important notification or changes to their system. The Security Pin will be used to verify the users authenticity once they are signed in (to unlock the screen as some time of inactivity).

Design Portfolio

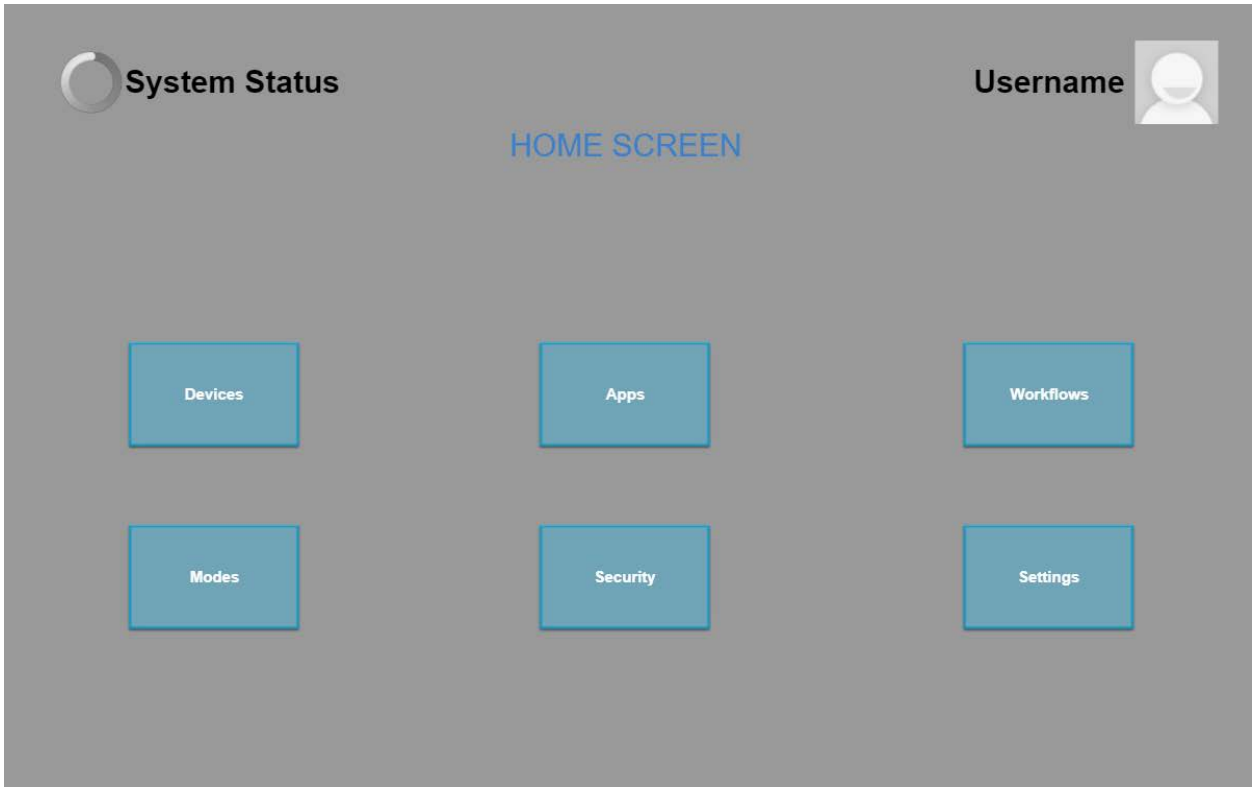


Lock Screen

This screen provides an extra level of security by locking the control once the user has been inactive on the system. The user can use the Unlock System button, which will ask the user for their security pin to unlock the system and get access to the system. This prevents strangers from accessing the system when the user is away from their system. This can help deter any wrong actions and malicious intent by strangers since our systems can allow a lot of high level systems.

We have also included 2 more details that will be shown once the system has been signed in and synced with an account. The top right side would always show the user name and the profile picture of the user that is signed in to the system at the moment. This would help user's identify who they are working as in the system, this comes handy when there are multiple users in the same house. We don't want users to make unwanted changes in others' accounts by mistake.Then on top left, it shows the user the current status of the system. This can vary from the server end to local devices. It keeps the user in the loop of what's happening with the system and lets the user understand easily if there is something wrong with the system. It can show critical information like when a device goes offline, security updates are pending or even when unauthorised devices or changes are made inside the system.

Design Portfolio



Home Screen

This is the main interface where the user will be interacting with the system. The center of the screen has a title that lets the user know which screen they are on right now. For this example, we are right now on the Home Screen. The Home Screen like pretty much the whole system can be customized according to the user's needs. With default options, the user get the following:

1. Devices : This option will give the user to control all their devices that are supported to the ecosystem as well as add new ones if needed. The devices will be in constant sync with the server to enable real time updates to the user. This allows the users to make informed decisions rather than doing guess work. The amount of control differs from device to device (Mainly based on what the manufacturer supports). For example some manufactures may allow granular control like the speed of the fan or the brightness and color temperature of the lights whereas some manufactures might not support it. But in case the manufacturer updates this functionality after the devices are synced it would be automatically updated with the same control as our system keeps on working with the server to give all controls available. You will also be able to turn off controls for features that you don't want to use in the Settings Panel.
2. Apps : The app tab will provide you with a bunch of 3rd party apps that help improve the user experience by working with the ecosystem. A good example for this would be the Spotify app using which you can stream your playlist over the speakers throughout your house without any issues. Since all the devices can be

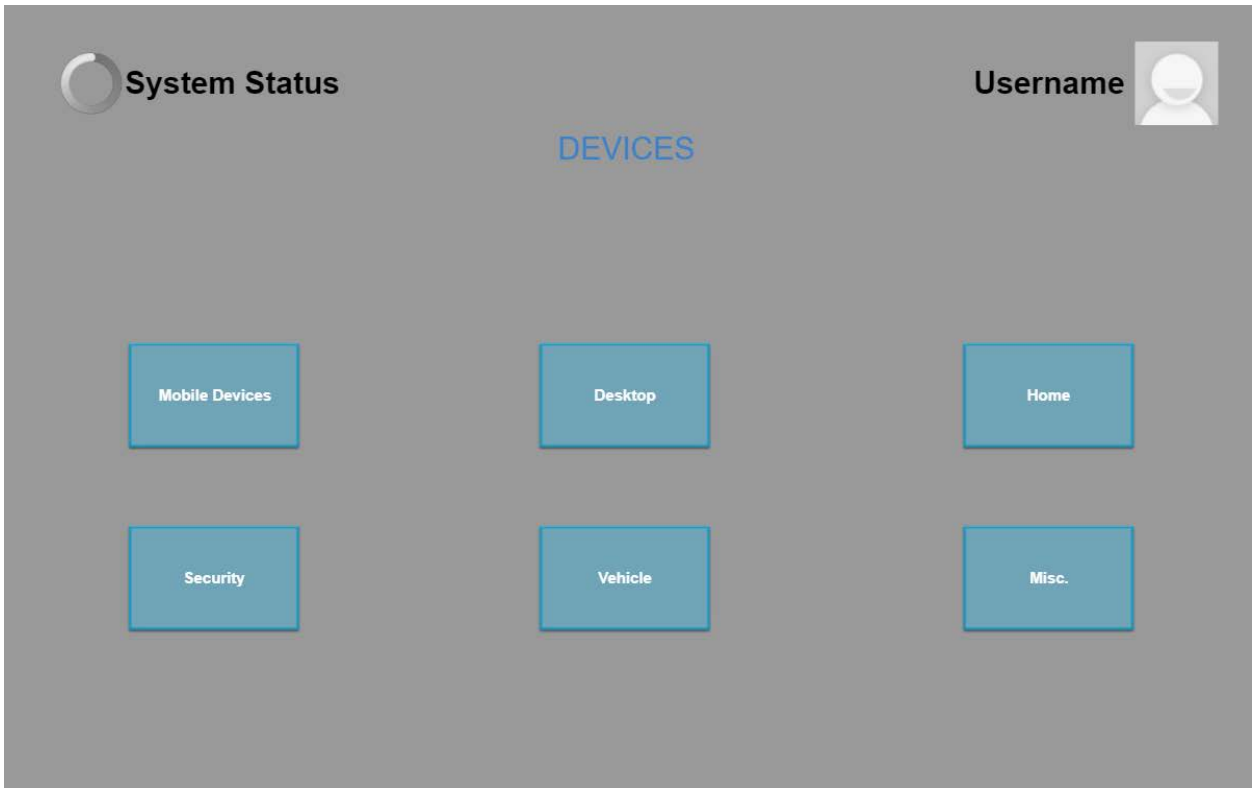
grouped according to the user choice there won't be any issues listening to music in only a particular room or set of speakers. SInce the API would be well documented any app developers can port their application to work with our ecosystem without any issues. Users can then install from a catalogue of apps by Approved Developers. This would ensure that no developers with malicious intent can gain unauthorised access to the system of users which can turn out to be a huge privacy & security issue.

3. Workflows : This tab will allow the users to do a predetermined set of actions that can involve one or more devices. A good example would be “Far from Home”, which would turn off all the lights in all rooms, turn off all devices in all rooms (Unless exceptions are made), Trigger an alarm if any doors or windows are open, Turn on all the security cameras and sensors to surveillance mode, check if there is a presence using proximity sensors in any of the rooms. This would help the user to reduce work whenever they want to leave the house and at the same time keep it secure. Thanks to our AI Workflow generator (dubbed Smartify) which takes the users personal details and usage patterns into account can suggest the user to make predictions for workflows. This works by learning the patterns the user is interacting with the system and then creating a chart of events that the user does on a regular basis.
4. Modes : This tab is similar but not same to Workflows. Modes are mainly meant to change how the system works in general. For example, there can be a mode when a user can ask all devices to go into maintenance mode where the devices and the server are synced and updated if necessary. Modes are more of an occasional run of predetermined functions that help the user maintain the system if needed. This is totally optional and is meant for Power Users where they can configure how each device or component interacts with others when a particular mode is active. For example your Smart Speakers might have been set to read your notification aloud but when Guest mode is active the Speakers will just play a chime to notify the user that a new notification is available. This would improve the overall quality of life of the system.
5. Security : This tab is mainly to change the security aspects of our system as well as the security devices. No devices that have been tagged “Security” like cameras and proximity sensors will be shown with normal devices to provide for secure access. All these devices will be accessible over here giving the user all control over the security of the system and the devices. From changing the security pin, mode to checking camera feeds and triggering alarms if necessary.
6. Settings : Provides important controls to the user over their system, devices and customizations. This can range from which all devices come under a particular group to who all access to a particular device. This is where Power Users can enable granular control over various devices and features.

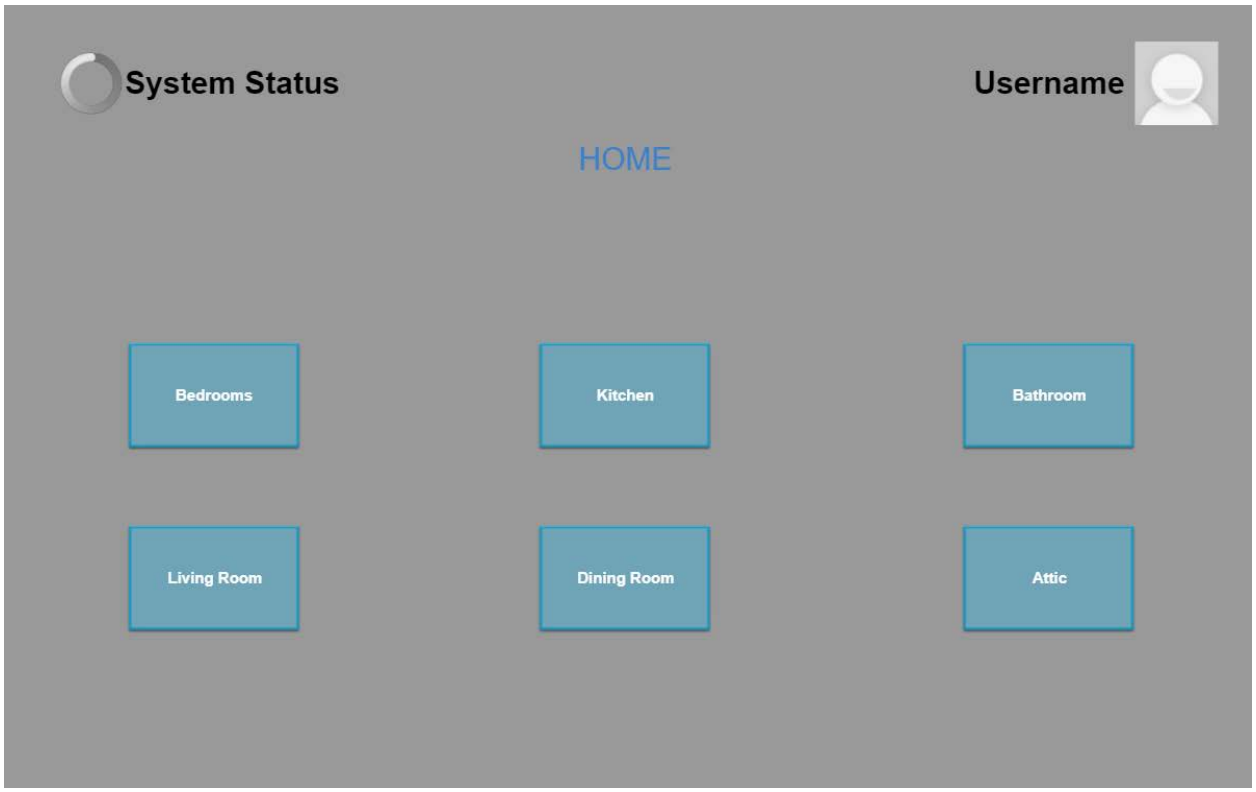
Workflows

Workflows as explained earlier contains a one click approach to do common tasks like turning off all lights or starting all the cleaning appliances like robot vacuum. This is designed to make the user interact less with the system to do their day to day tasks. Users will be able to create their own custom workflows or use the AI Smartify option to get suggestions based on their daily usage. This will help the user to make their day to day life easier. Workflows can become as complicated and granular as the user wants it to be. From controlling the color temperature of a particular set of lights to turning on the coffee maker anything can be configured.

Design Portfolio

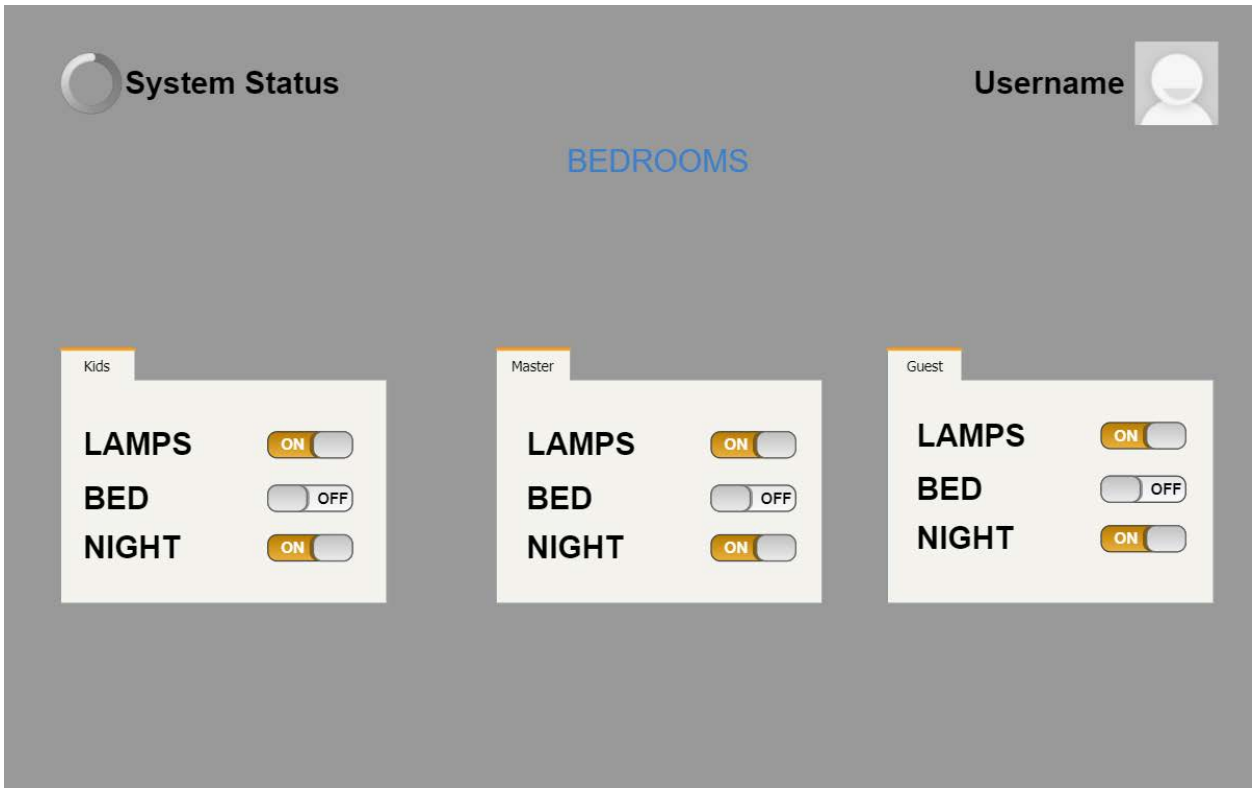


Devices



Device/Home

Design Portfolio

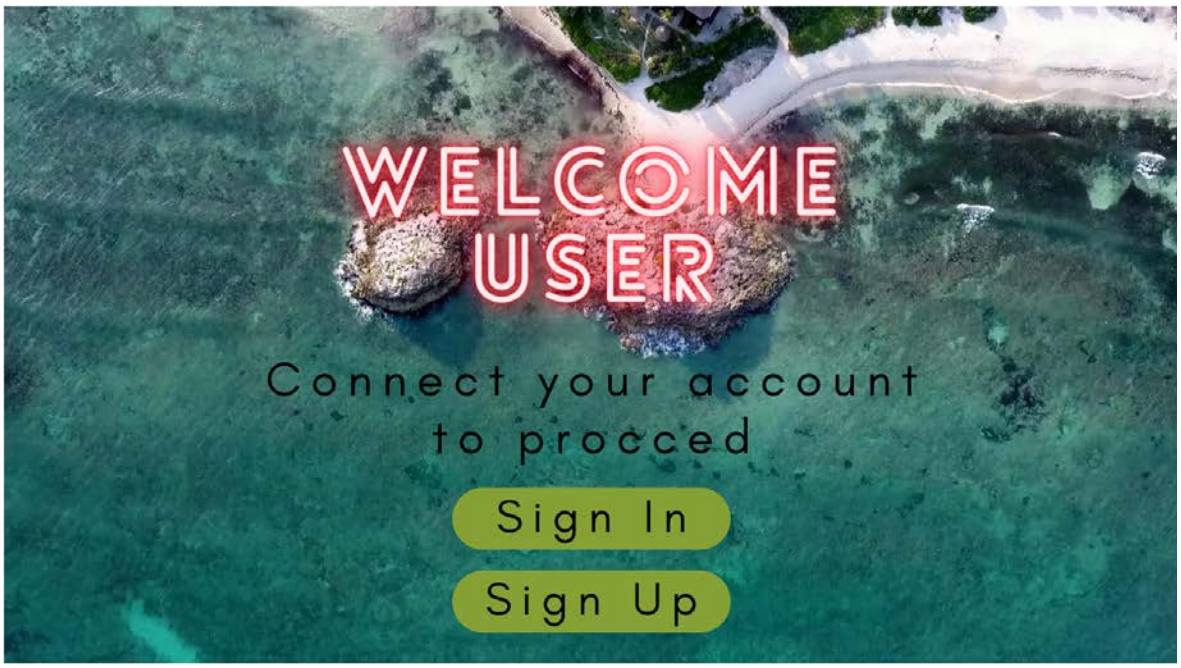


Bedroom Lights

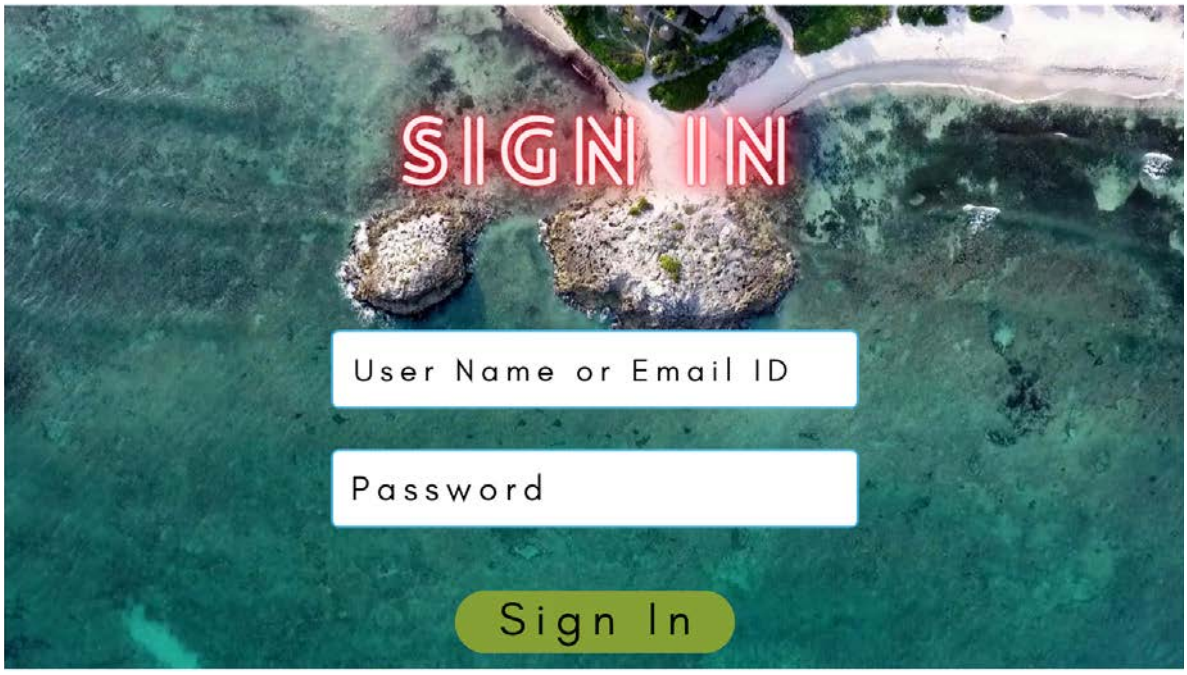
These screens show all the devices that have been connected to the system, categorized by their type. All devices that belong to the user's home would be under the "Home" tab. Which is again categorised based on the different rooms, the devices are located at. By default each device would be configured to be in simple mode, which only provides common tasks to avoid confusion. The user gets to turn on and off in this example all his lights available in each of his rooms. If needed he can go to the Power User mode and turn on granular control for these devices.

Design Portfolio

Screens (High--fidelity Prototype)

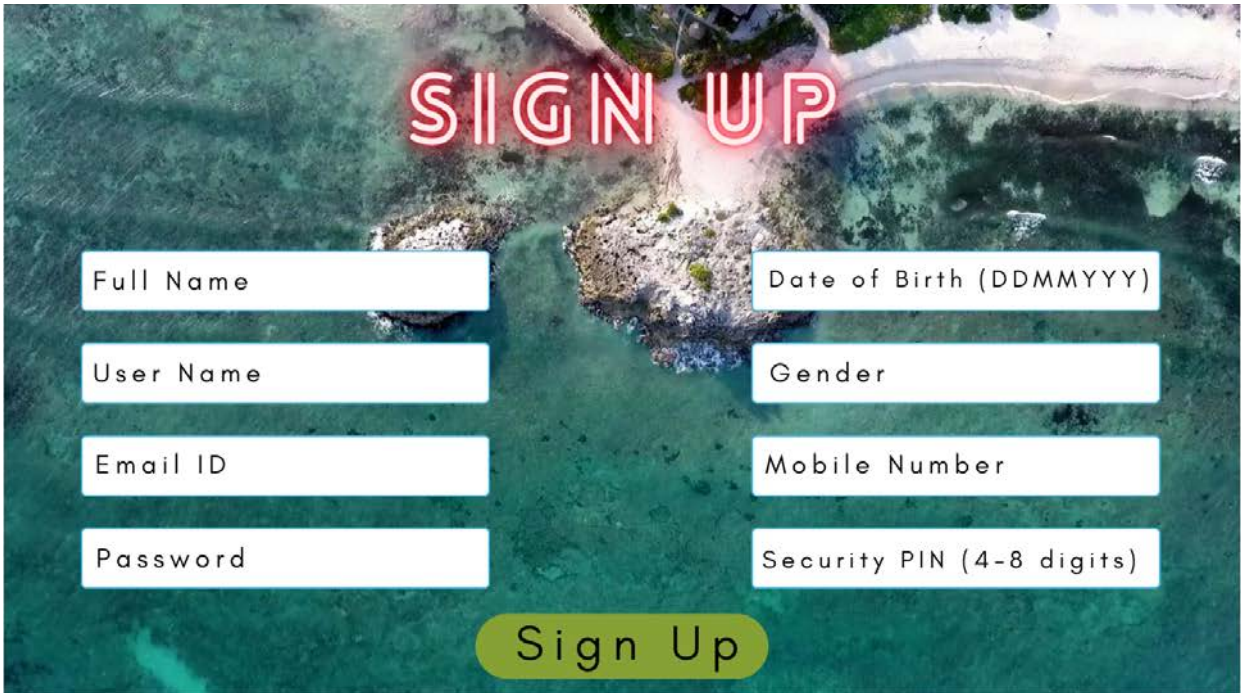


Registration Page



Sign In Page

Design Portfolio



Sign Up Page

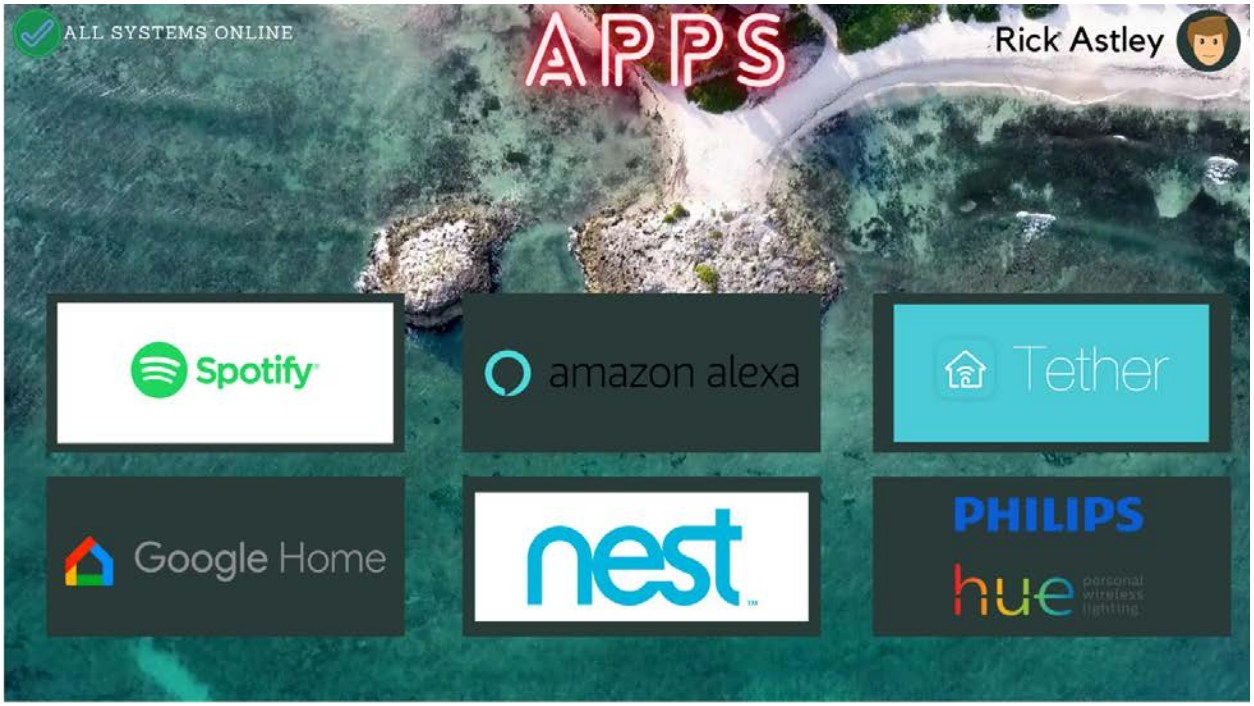
Welcome Page

Design Portfolio

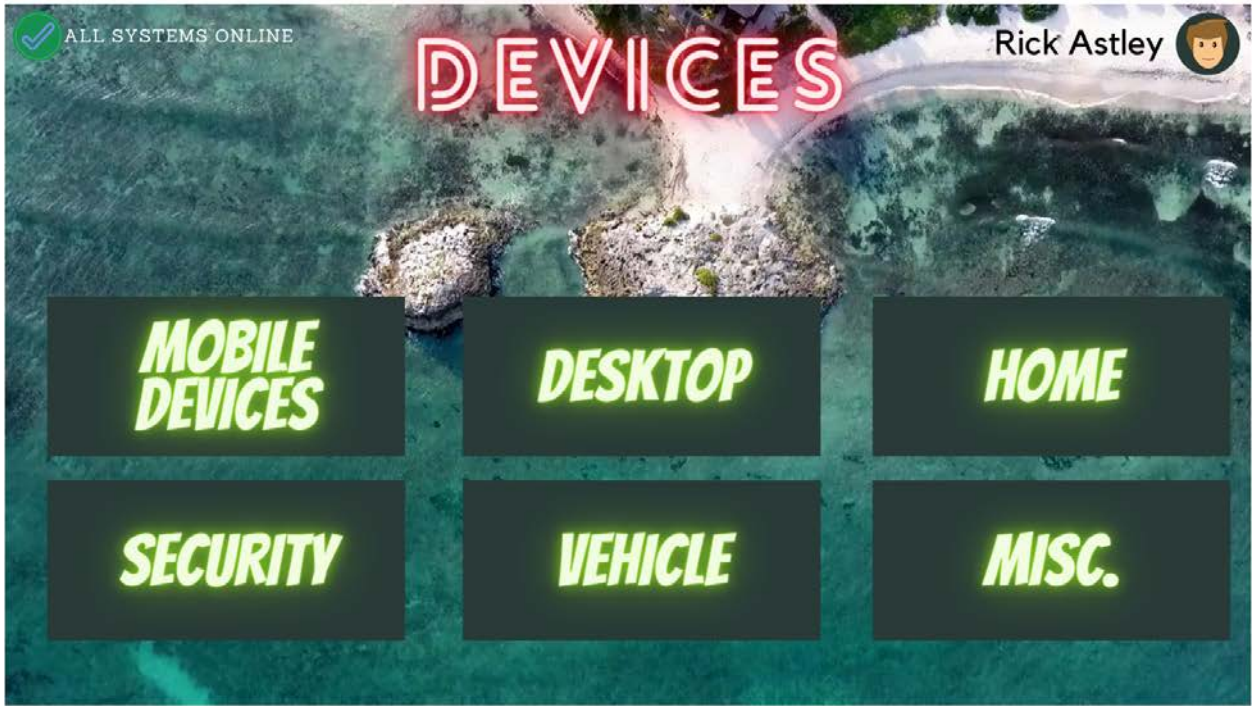
Home Screen

Workflows

Design Portfolio



Apps



Devices

Design Portfolio

Devices - Home

Devices - Rooms - Bedrooms

Design Portfolio

Animated Prototype

Canva Design - AIO Control (All In One Control)

Conclusion

As we talked about in our introduction, our aim was to make an all in one interface that will give the user an all in one system to control all their smart devices. We started the designing process from scratch. We replicated the way how a new user would work thro his way with a new system. Starting with the registration screen where the user is asked to use an account to sync their settings and devices. We give the user two options, Sign In using his pre-existing account or if the user is new to the platform and doesn't not have an account create a new one using the user’s input of their personal details. Then we move on to designing the lock screen which serves an important part as a security measure. Moving on we did the home screen which contains a variety of buttons, namely Devices, Apps, Workflows, Modes, Security & Settings. We then work on a simple but informative interface for each of the options making sure that it covers all basic aspects and still provides options for advanced users also known as Power users. We then make sure that all the information displayed on all screens is as informative as they can while maintaining simplicity. This model should be perfect as it serves all the goals that our user personas had while maintaining ideal design conditions.

Design Portfolio

References

1. Linus Sebastian, Wikipedia, https://en.wikipedia.org/wiki/Linus_Sebastian
2. Smart homes and beyond ICOST 2006 : 4th International Conference on Smart Homes and Health Telematics, International Conference on Smart Homes and Health Telematics (4th : 2006 : Belfast, Northern Ireland) Chris D Nugent; Juan Carlos Augusto; International Conference on Smart Homes and Health Telematics c2006, https://librarysearch.le.ac.uk/permalink/f/8vvj9h/44UOLE_ALMA51136890300002746
3. Smart Home 2.0: Innovative Smart Home System Powered by Botanical IoT and Emotion Detection, Chen, Min ; Yang, Jun ; Zhu, Xuan ; Wang, Xiaofei ; Liu, Mengchen ; Song, Jeungeun Ziviani, Artur ; Capellà, Maria Magdalena Payeras ; Wan, Jiafu ; Femenias, Guillem ; Jain, Raj ; Lin, Jia-Chin ; Biswash, Sanjay Kumar ; Lloret, Jaime ; Agüero, Ramón ; Rodrigues, Joel J. P. C ; Xia, Min, Mobile networks and applications, 2017-04-22,Vol.22(6),p.1159-1169,https://librarysearch.le.ac.uk/permalink/f/mvjm1g/TN_cdi_springer_primary_2017_11036_22_6_866
4. Design and application of a KNX-based home automation simulator for smart home system education, Toylan, Mehmet Y ; Cetin, Engin, Computer applications in engineering education,2019-11,Vol.27(6),p.1465-1484, https://librarysearch.le.ac.uk/permalink/f/mvjm1g/TN_cdi_crossref_primary_10_1002_cae_22162
5. A Smart Home System for Information Sharing, Health Assessments, and Medication Self-Management for Older People: Protocol for a Mixed-Methods Study, Norell Pejner, Margaretha ; Ourique de Morais, Wagner ; Lundström, Jens ; Laurell, Hélène ; Skärsäter, Ingela, JMIR research protocols, 2019-04-30, Vol.8 (4), p.e12447-e1244, https://librarysearch.le.ac.uk/permalink/f/mvjm1g/TN_cdi_swepub_primary_oai_DiVA_org_hh_39753
6. Internet of things, Wikipedia, https://en.wikipedia.org/wiki/Internet_of_things
7. Lightful user interaction on smart wearables, Yoon, Hyoseok ; Park, Se-Ho ; Lee, Kyung-Taek Hsu, Ching-Hsien, Personal and ubiquitous computing, 2016-09-09, Vol.20 (6),p.973-984, https://librarysearch.le.ac.uk/permalink/f/mvjm1g/TN_cdi_gale_infotracacademiconefile_A468784334