Mobile and adaptive HMI

Case Study WS21/22

„LIGHT SHOW APP “

Presented By:

Prasad Raju Kalidindi (Group Leader)– 12100544

Aditi Atul Hiray – 12100378

Mahadev Prem – 12100009

Thomas John – 00821402

Tom Jojo Palamattam – 00821354

Advisor:

Prof. Dr. Marcus Barkowsky

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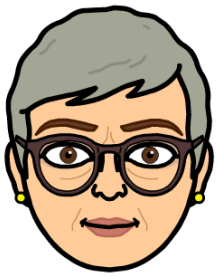
UX DESIGN PROCESS

PERSONAS

PERSONA 1



Name: Millie Brown

Age: 62

Location: LA

Status: Married

Profession: Professional party planner

Hobbies: Fashion designing and home brewing.

Goals: To make all parties a cherishing memory.

Dream: To buy a beach house at Malibu.

Likes: Beaches, adventure sports and yoga.

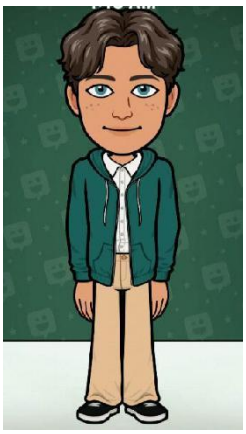
Dislikes: Board games and Chinese food.

Quote: "Life is now"

User Requirements for the App:

- Wants to create a lightshow for her client's parties.
- Easy to use and understand UX design.
- App should be able to wirelessly be connected to the light equipment.
- Single mode to activate the app for the entire duration of the lightshow (Preprogrammed mode).
- Sudden kill switch in case of emergencies.

PERSONA 2



Name: Mathew Weston

Age: 16

Location: Barcelona

Status: In a relationship.

Profession: Professional footballer FC Barcelona Juvenil A.

Hobbies: Adventure Sports, Social Work, Martial Arts.

Goals: To be the best athlete in the club and to never quit when things get tough.

Dream: To build an international NGO for athletes with disabilities.

Likes: Spending time with children with disabilities and providing voluntary football coaching sessions for children with disabilities.

Dislikes: Fast-food, Cats.

Quote: "Be the best or watch them become the best"

User Requirements for the App:

- Wants to create a lightshow for "The Little Angel Children's Home" 15th anniversary.
- Easy to understand UX
- Single button to activate the app for the entire duration of the lightshow (Preprogrammed mode)

PERSONA 3

Name: Divya Bharathi

Age: 38 Status: Married with one child

Profession: Kindergarten Teacher

Hobbies: Reading Books, Organising Student activities

Goals: Getting students interested in learning new things.

Dream: To develop an education curriculum that helps every student.

Likes: Sunrise, spending time with children, Organising Trips, Learning new things.

Dislikes: Meat, Deadlines, Quote: "Homework is fun if you put your heart to it"

User Requirements for the application

• Wants to create a light show for Children's Day.

• Greatly helps if the app is in native language.

• Requires simple and easy operation.

• Can be installed on multiple devices.

• Option for testing the lights

PERSONA 4

Name: Xavier John

Age: 23

Status: Single

Profession: Professional Dancer.

Hobbies: Travelling, Dance, Music, Reading

Goals: Try new experiments in dance.

Dream: To develop a dance form by using light

Likes: Research in new dance forms, DJ, Pubs

Dislikes: Fast food

Quote: "Practice makes you perfect"

User Requirements for the application

- Wants to create a light show for stage show.
- Application should be simple and user friendly.
- Feature with immediate response.
- Can be installed on multiple devices.
- Option for testing the lights.
- Feedback and questioning

PERSONA 5

Name: Jordan Carter

Age: 22

Status: Married

Profession: Disc Jokey

Hobbies: Music, Golf, Reading

Goals: To run an event with a DJ controller instead of a laptop

Dream: To become a well-known music producer

Like: To spend time with family, traveling and Barbecue

Dislike: Soft drinks, TV and Trucks

User Requirements for the Application

- Wants to create a light show for his events
- Can be used without internet
- Cross-platform support
- The app must be user friendly and easy to use

PERSONA 6

Name: Max Philip

Age: 10

Location: France

Status: Single

Profession: School Student

Hobbies: Basketball, Piano, Reading.

Goals: Excel in sports.

Dream: To become a basketball player.

Likes: Playing video games, Reading comic books.

Dislikes: Academics.

Quote: "Be the best or watch them become the best"

User Requirements for the App:

- Multiple Lights
- Colorful texture of lights
- App should be easy to operate

USER REQUIREMENTS

- Feature to connect to a light device system
- Feature to turn on a particular light.
- Feature to turn off a particular light.
- Pre-programmed modes for light shows
- Feature to connect and disconnect lights
- Feature to test the equipment and confirm proper functioning.
- Tutorial for using the application.
- Feedback area for future improvements of the application.

USABILITY

Learnability

we created mobile application with good usability we enable users to convert faster. If the user wants to switch to different light modes in this application, we provide them with a seamless mobile application experience

Accessibility

It is also important to ensure that our mobile application does not hack a loading error which in turn create satisfaction to the user it is also important that to make this mobile application available to all the customers with respective to their location via play store or apple store

Clarity

User who will come to visit the mobile application with a specific goal such as Preprogrammed mode, Manual Mode, Testing Mode, Connect to Device, Tutorial and if they cannot find their specific modes, they may never use this application again. Because of this reason we should help them to achieve their goals.

Our Main goal is to provide a consistent experience to the user when they reach their objectives and guide them across the mobile application, implement the strategies which already familiar with user and structure the whole content. Hence, we have added tutorial as a mode for better understanding of application.

Relevancy

The mobile application meets the user need by knowing the customers personas, their needs, interests and issues to address them and provide solutions. Any of the customers' requests a help regarding any issue there should be proper channel to communicate with the user. Hence, we have added a button called contact us to provide users a channel of communication.

Errors and satisfaction

Usability testing can be used to test the app by using these three methods, which are Explorative, assessment and Comparative methods.

Explorative: it is used to evaluate the effectiveness and usability of preliminary design or the prototype during the early product development stage. Light show control application has been evaluated its effectiveness from its early stage of its development.

Assessment: in this method, it accesses the technologies in the app like real-time trials to monitor satisfaction, usability and effectiveness.

Comparative: it used to compare different solutions by defining their strength and weakness and enquire users which one they need.

This way error could be minimized as well as the satisfaction of user who use this application could be improved

Memorability

Even in a period of inactivity, the user data as it is stored in the app memory the data is not deleted hence it is easy to get back to full efficiency. In this application, very less user data is stored in the system memory. Hence, no such user data is deleted.

UTILITY

The utility of an application defines how practical and useful it is. Usefulness of the application is the combination of both utility and usability. Utility is the question of what does the system do. The questions to be asked when referring to the applications utility is, does it have the features, does it solve the users' real needs, does it do something that users what the app to do and whether it has a purpose that the user accepts. Even with the wonderful UX design, if the app is designed to have the wrong features, it becomes useless.

Utility should ensure that the application meets the needs of the user and even if it solves a problem, it may not be of any value to the if it doesn't meet their requirements in other areas like cost and size.

The light show apps was designed to control the operation of lights wirelessly through an application that can be installed in a mobile device. The UX of the application was designed to be simple yet effective in such a way that multiple utility features were provided as explained below,

- The app includes a manual mode for the user to control the system manually according to the users interests and also a pre-programmed mode, developed by the developers which provides several pre-programmed modes for the user to activate which makes the users task easier.
- The app comes with a Bluetooth feature so that there is no need to physically connect the mobile device with the lights.
- The testing mode of the app allows the user to test the lights before commencement of the light show to ensure that complete setup is working perfectly prior to starting the light show.
- The app also provides an inbuilt tutorial video which teaches the user how to use the application and also guides the user through the apps various features.

QUALITY OF EXPERIENCE (QoE)

Quality of experience relies on the outcome of the user's expectation is met with the use of the application or service. The quality of experience might differ from person to person since it is affected by the user's personality and state.

The quality of experience has two components

- **User**
- **Evaluation Object**

User: QoE mostly depends on individual users' unique experience with the app. The Lightshow app is based on a dark theme since most modern smartphones offer a dark theme and a survey conducted by Android Authority stated 82% of android users use a dark theme in their smartphones. Furthermore, the indented user-base for this app belongs to the user base of 20-30 years old and they mostly prefer dark mode.

This application was designed with many characteristics. The user can be influenced by System, Context, or human elements. The system influence factors can be content, network, or media-related. The Lightshow app works offline so that the network-related issues won't affect the user experience. The context influence factors have been taken into consideration and the app is designed to run well on 5–6-inch mobile devices. The Light Show app is free of cost to appeal to people of all demography and socio-economic status.

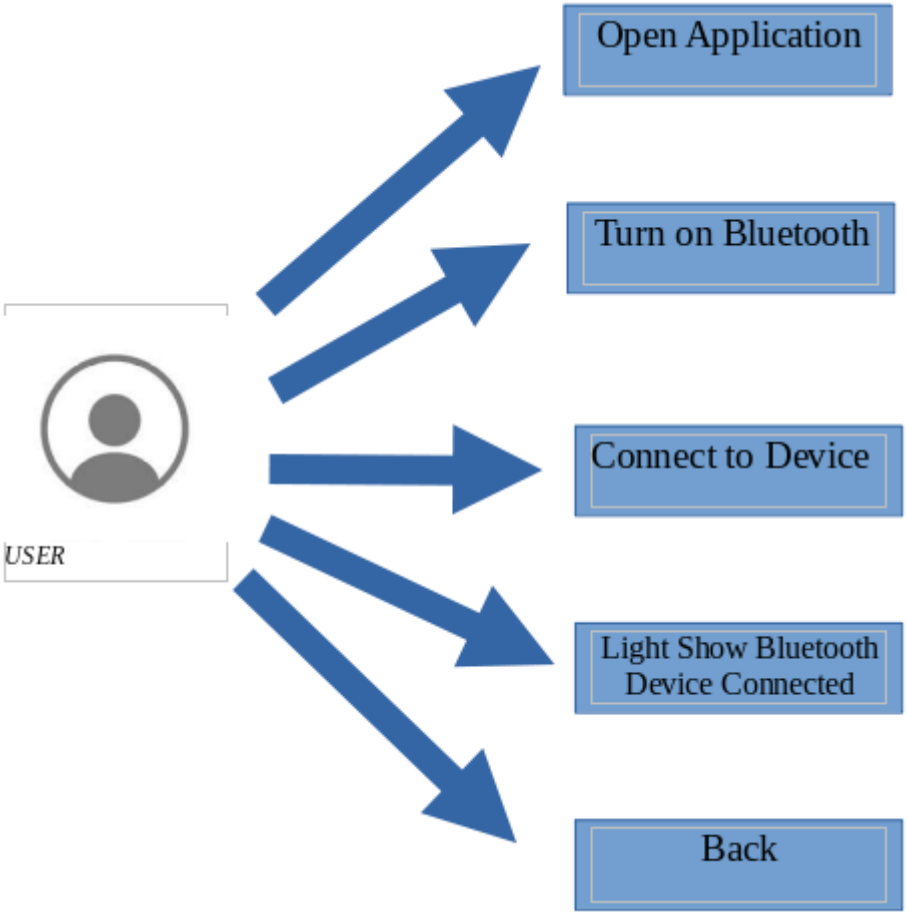
Evaluation Object: The success of the app depends on the enjoyment of the users who use this app. The Lightshow app requires the appropriate hardware and software. The hardware requirement includes an android phone on the arm architecture with Bluetooth support. The software requirements include an android version newer than KitKat. The system influence factors also play an important role in the evaluation object.

In the Evaluation Object, the features of QoE play an important role. The features in QoE are

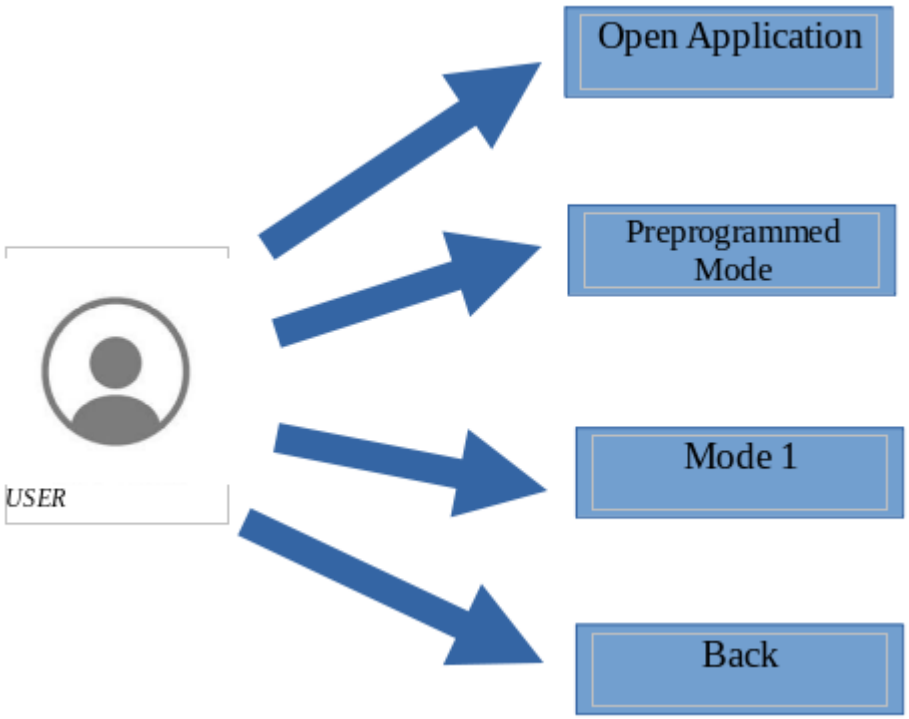
- **Direct Perception:** The Lightshow app is designed with all the modern design elements to make the app look elegant and modern.
- **Interaction:** The app is lightweight and is tested for bugs and security vulnerabilities so that the app runs smoothly and is responsive. The Lightshow app also has a user-friendly interface for easy navigation of the app.
- **Usage Situation:** The Lightshow app features large buttons and offers tutorial videos in the app to ensure accessibility. The app is tested for stability.
- **Service:** The user interface design and aesthetics are important reasons why people keep using certain apps. The overall usability and usefulness of this app were enhanced with the addition of a manual lighting mode.

USE CASE DIAGRAM

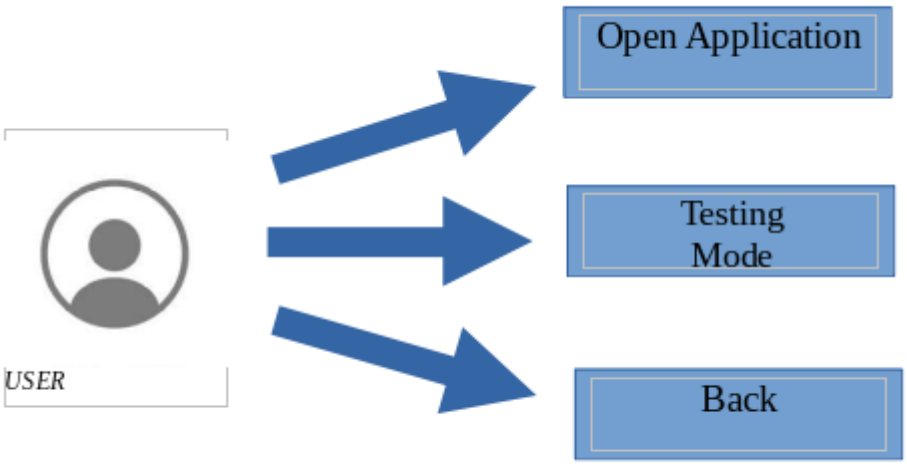
CASE 1



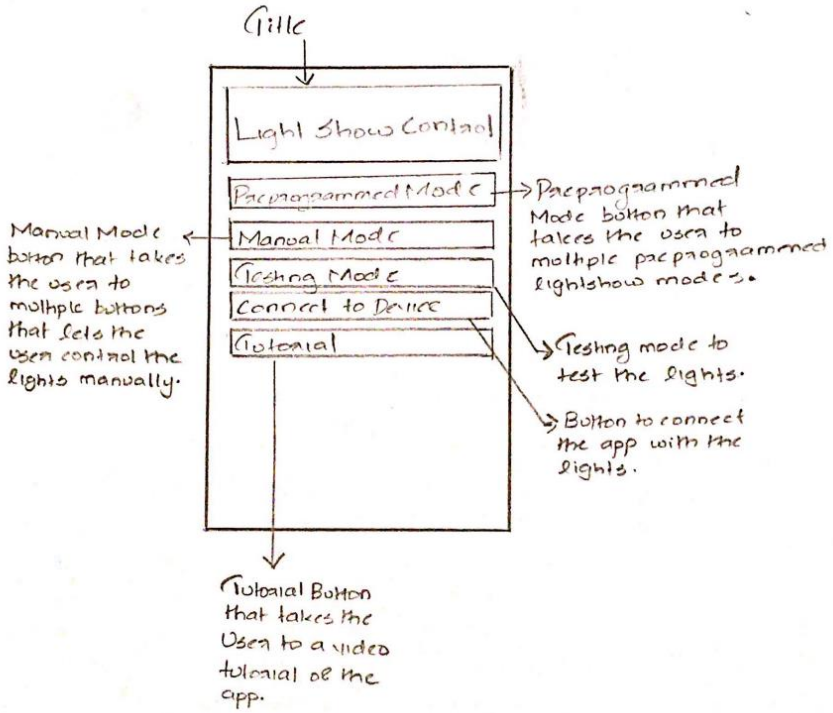
CASE 2

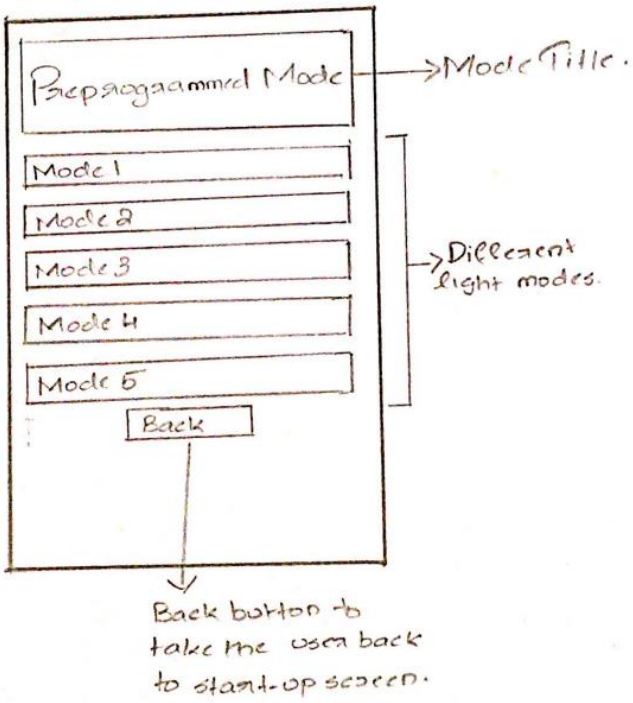

Open Application
Preprogrammed Mode
Mode 1
Back
USER

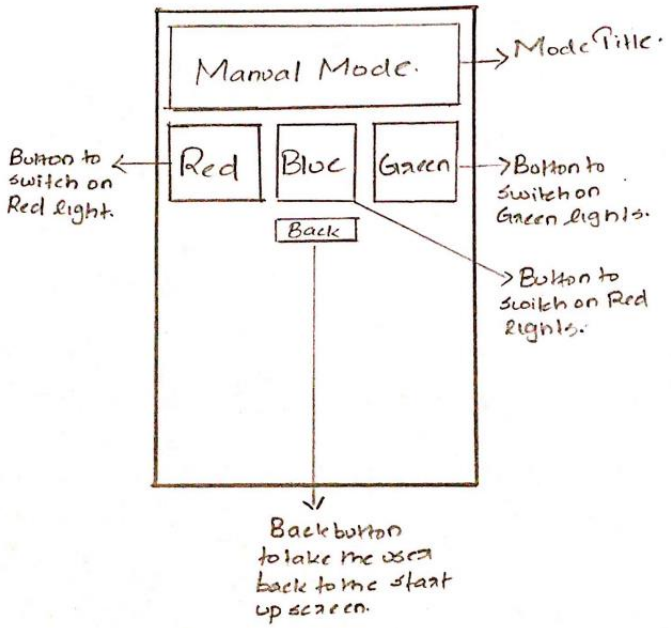
CASE 3

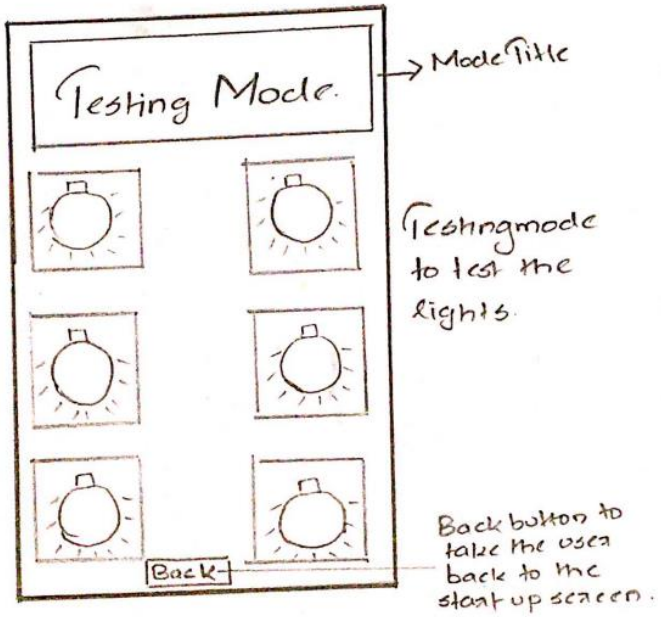

Open Application
Testing Mode
Back
USER

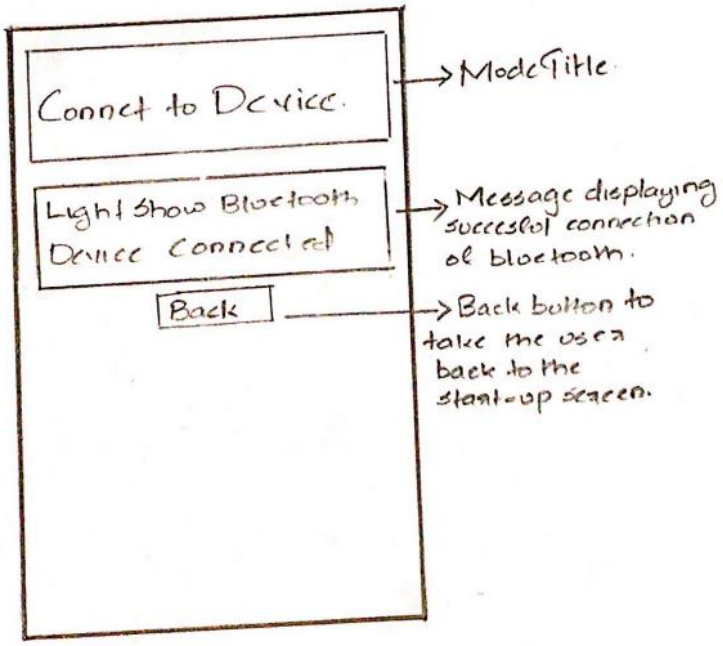
SCRIBBLES

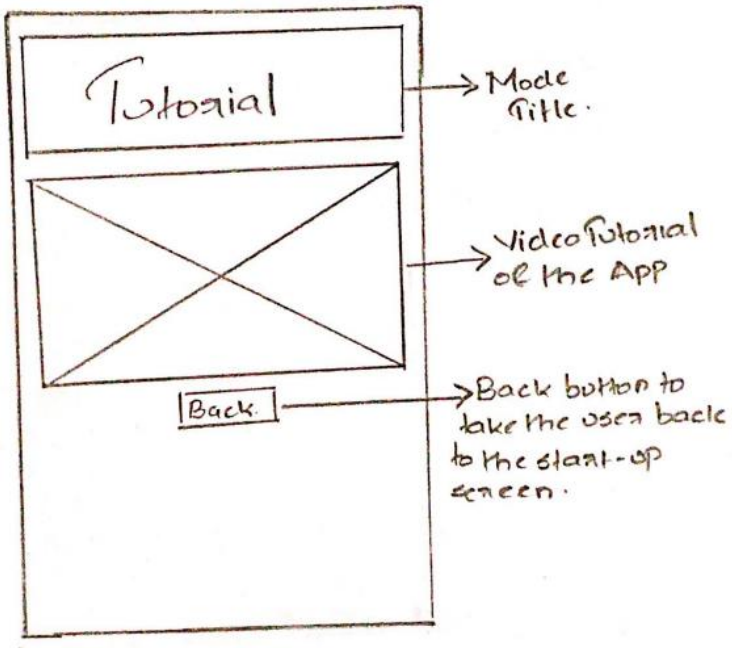

Title
Light Show Control
Preprogrammed Mode
Manual Mode
Testing Mode
Connect to Device
Tutorial
Preprogrammed Mode button that takes the user to multiple preprogrammed lightshow modes.
Manual Mode button that takes the user to multiple buttons that lets the user control the lights manually.
Testing mode to test the lights.
Button to connect the app with the lights.
Tutorial Button that takes the User to a video tutorial of the app.


Preprogrammed Mode
Mode Title.
Mode 1
Mode 2
Mode 3
Mode 4
Mode 5
Back
Different light modes.
Back button to take the user back to start-up screen.


Manual Mode.
Mode Title.
Red
Bluc
Green
Button to switch on Red light.
Button to switch on Green lights.
Back
Button to switch on Red lights.
Back button to take the user back to the start up screen.


Testing Mode.
Mode Title
Testingmode to test the lights.
Back
Back button to take the user back to the start up screen.


Connect to Device.
Mode Title
Light Show Bluetooth Device Connected
Message displaying successful connection of bluetooth.
Back
Back button to take the user back to the start-up screen.


Tutorial
Mode Title.
Video Tutorial of the App
Back.
Back button to take the user back to the start-up screen.

CARD SORTING

Manual Mode

Light Show Control

Preprogrammed Mode

Double Color Mode

Mode 3

Mode 1

Tutorial

Testing Mode

Connect to Device

Bluetooth

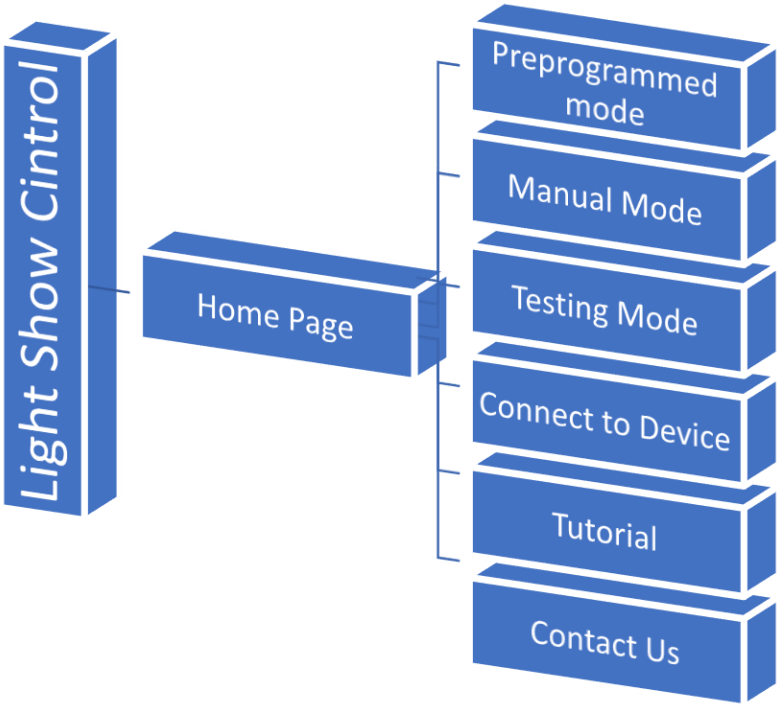
Single Color Mode

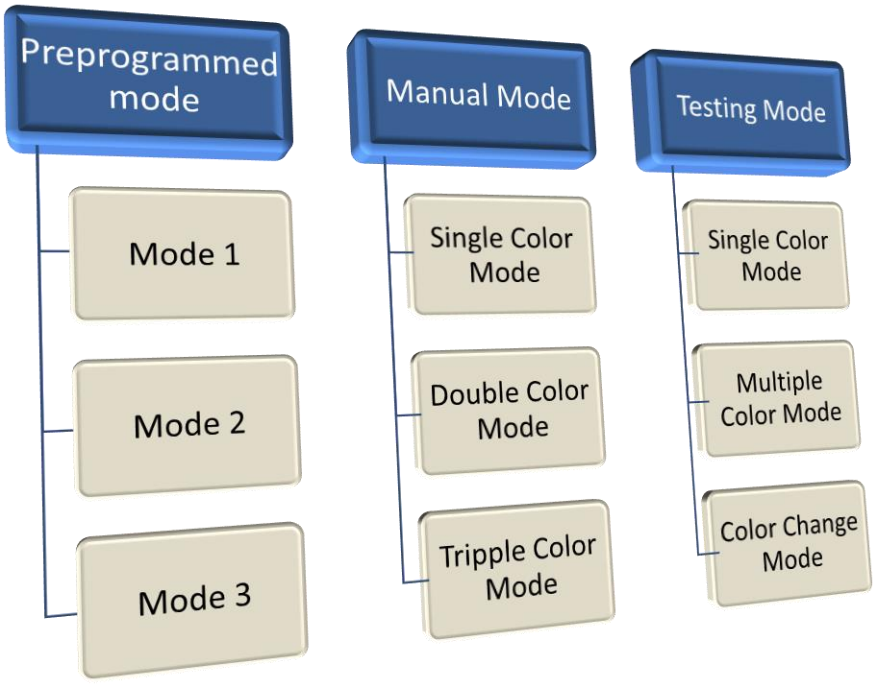
Mode 2

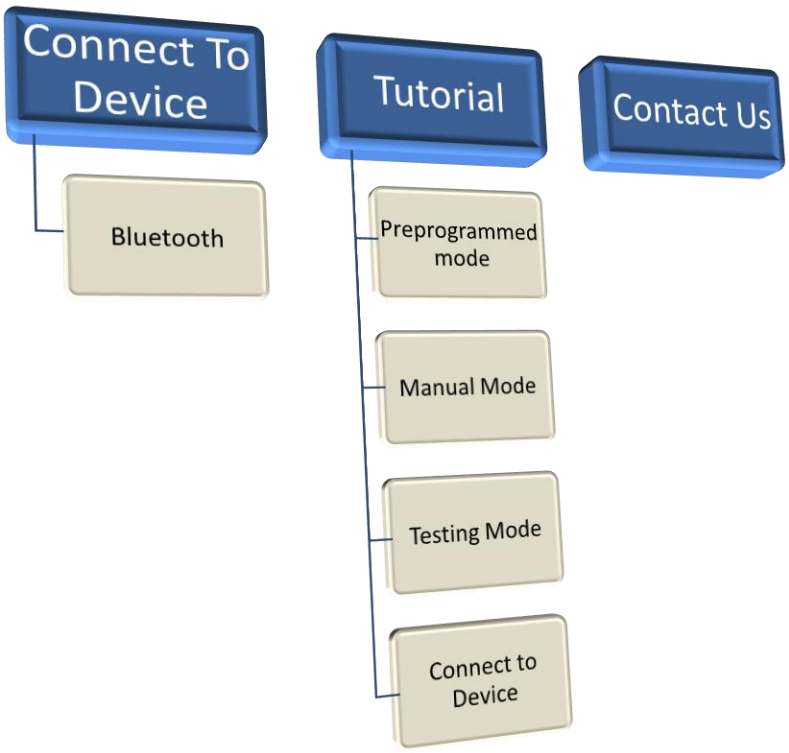
Single color Change

Tripple Color Mode

Multiple Color Change




Preprogrammed mode
Mode 1
Mode 2
Mode 3
Manual Mode
Single Color Mode
Double Color Mode
Tripple Color Mode
Testing Mode
Single Color Mode
Multiple Color Mode
Color Change Mode


Connect To Device
Bluetooth
Tutorial
Preprogrammed mode
Manual Mode
Testing Mode
Connect to Device
Contact Us

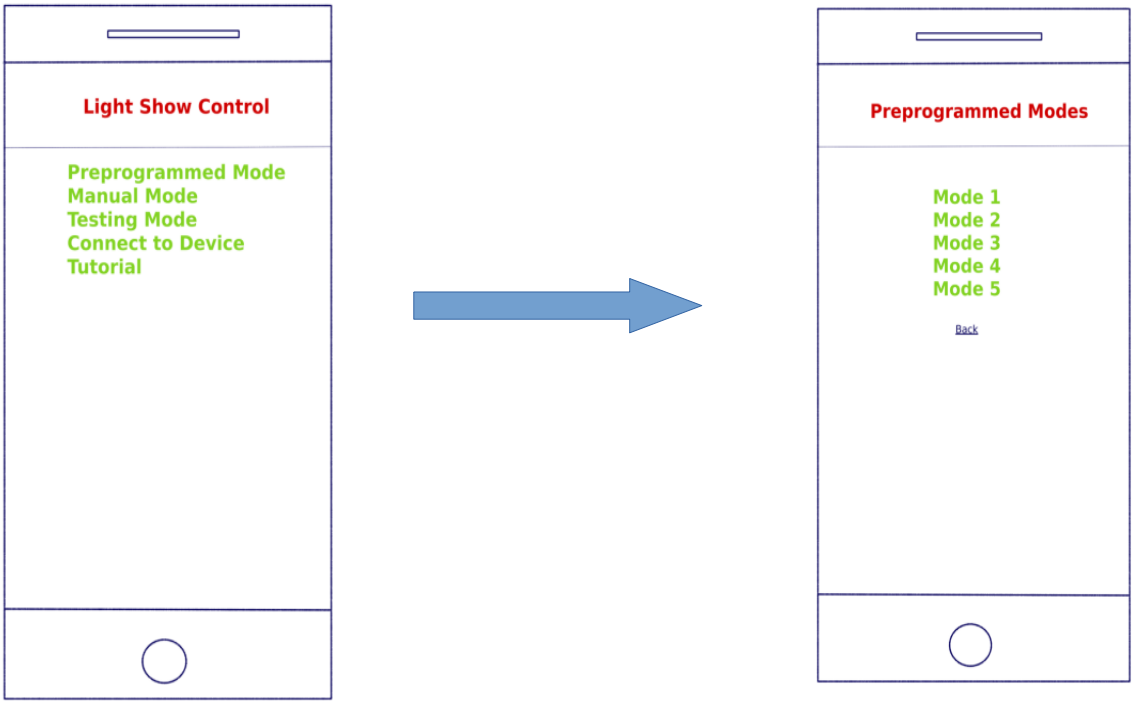
WIRE FRAMES

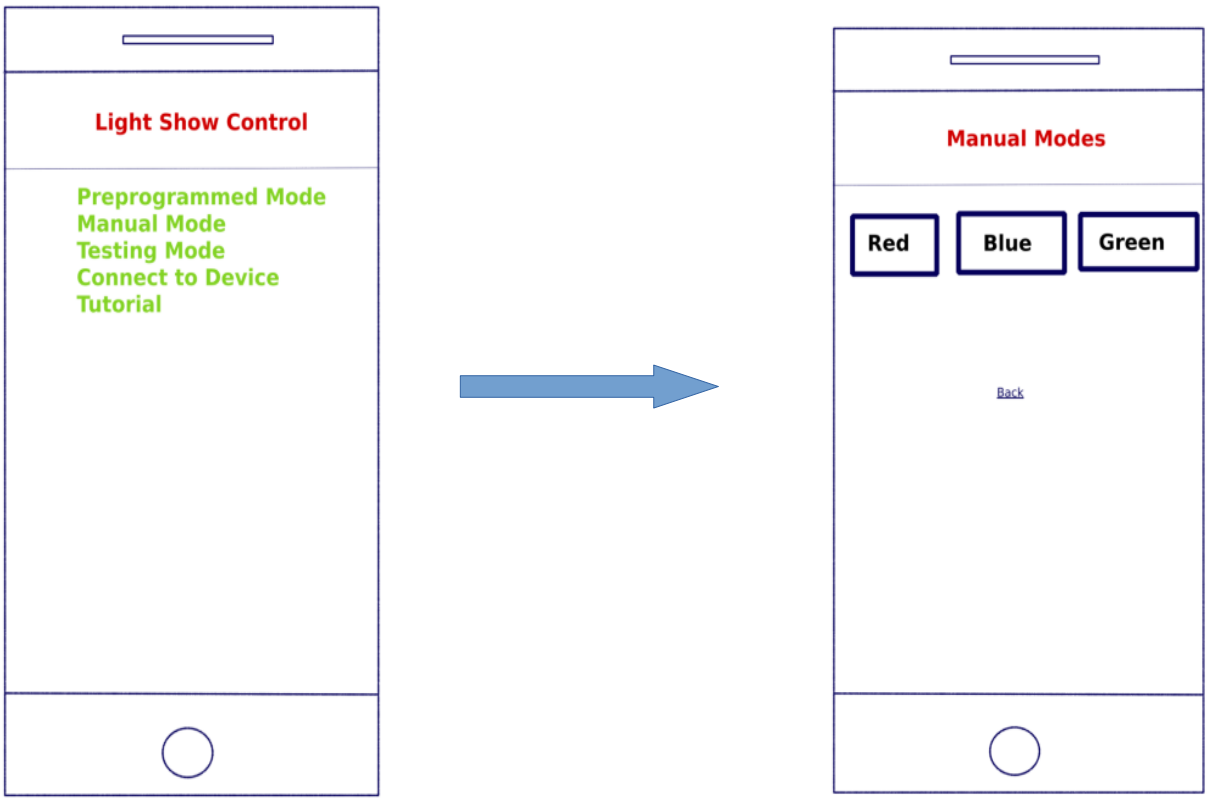
A wire-frame is basically a blue print that serves the designers and programmers the basic structure of the service that is being built. It is one of the first step in an UX design and takes into account the user requirements. The purpose of a wire-frame model is to offer an visual representation of the project to clients and project team.

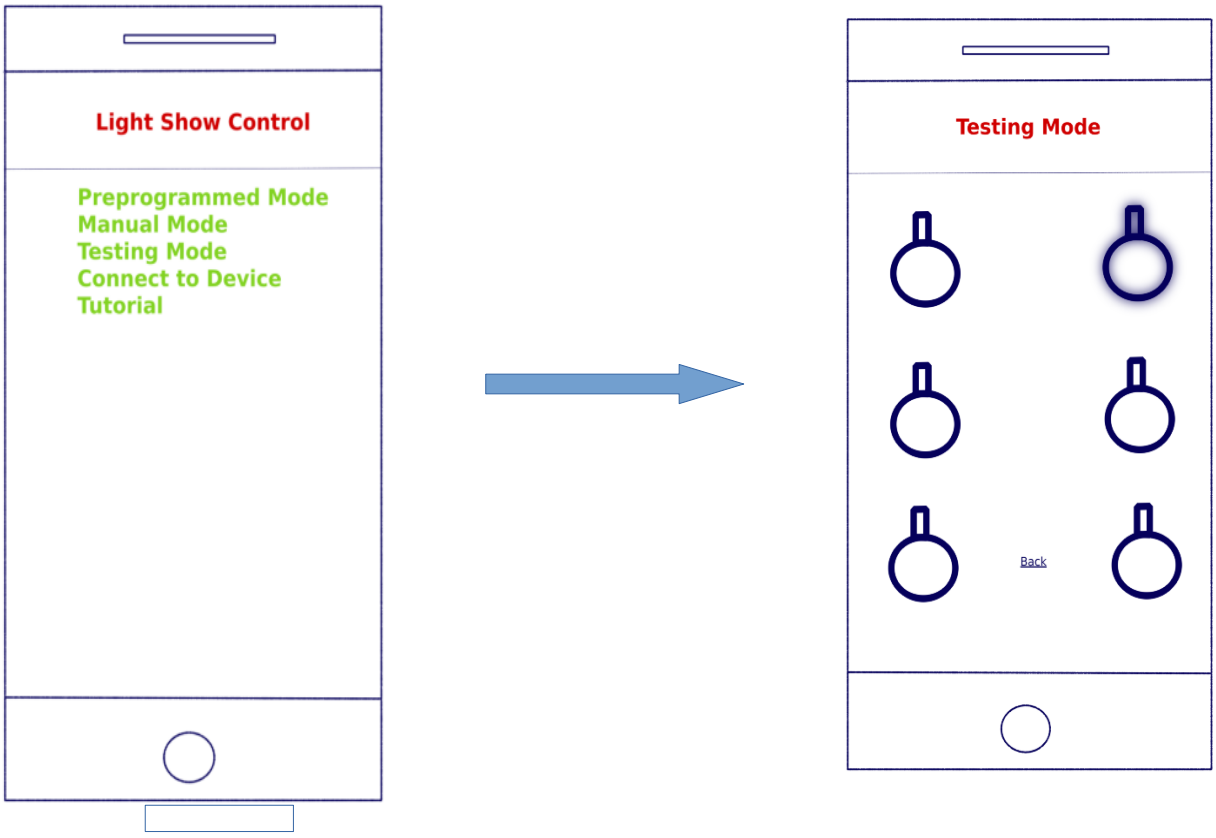
On opening the app, the user is greeted with five options.

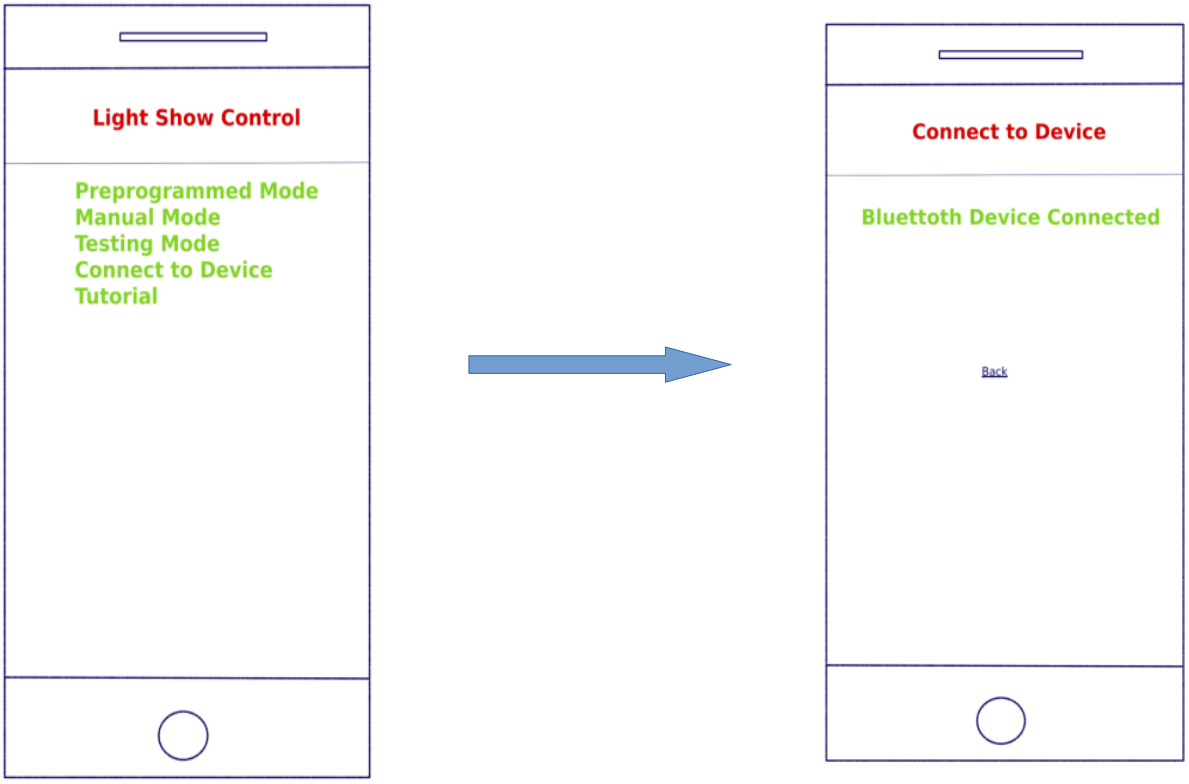
1. Preprogrammed mode
2. Manual Mode
3. Testing Mode
4. Connect to Device
5. Tutorial

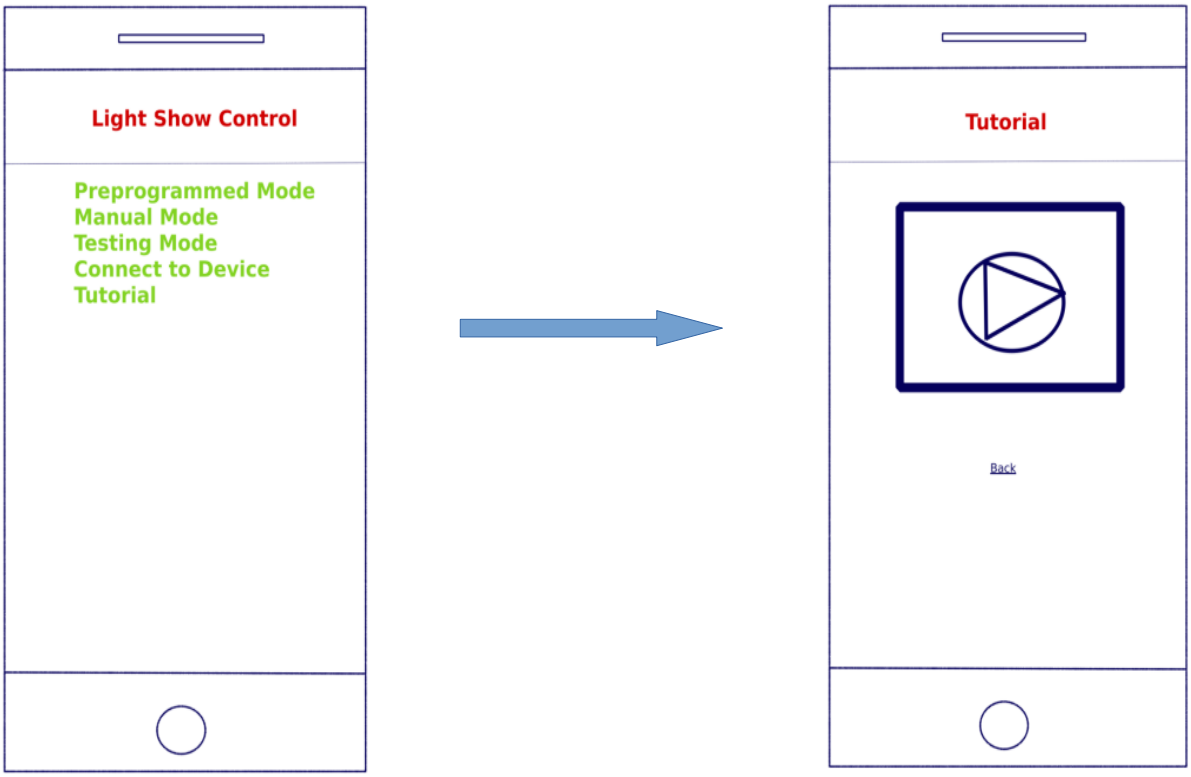
The “Preprogrammed mode” offers five light patterns that are pre-programmed. The “Manual Mode” offers the users to create there own light pattern. A “Testing mode” is provided to test wheather all lights are functional. “Connect to device” enable users to connect to Bluetooth. A tutorial video is provided in “Tutorial Mode”




Light Show Control
Preprogrammed Mode
Manual Mode
Testing Mode
Connect to Device
Tutorial
Manual Modes
Red
Blue
Green
Back


Light Show Control
Preprogrammed Mode
Manual Mode
Testing Mode
Connect to Device
Tutorial
Testing Mode
Back


Light Show Control
Preprogrammed Mode
Manual Mode
Testing Mode
Connect to Device
Tutorial
Connect to Device
Bluettoth Device Connected
Back


Light Show Control
Preprogrammed Mode
Manual Mode
Testing Mode
Connect to Device
Tutorial
Tutorial
Back

PROTOTYPE

The prototype was built for two OS platforms,

- iOS
- Android

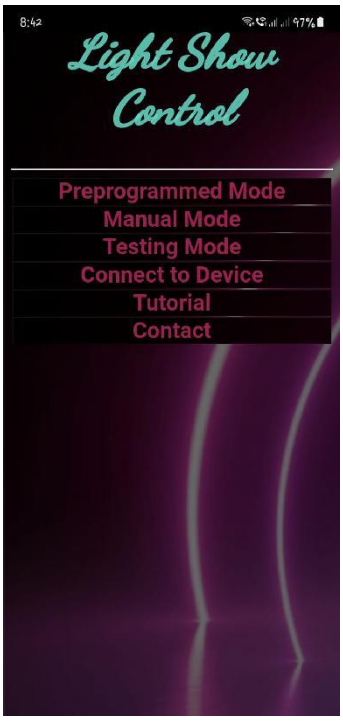
The plugins used in the app are,

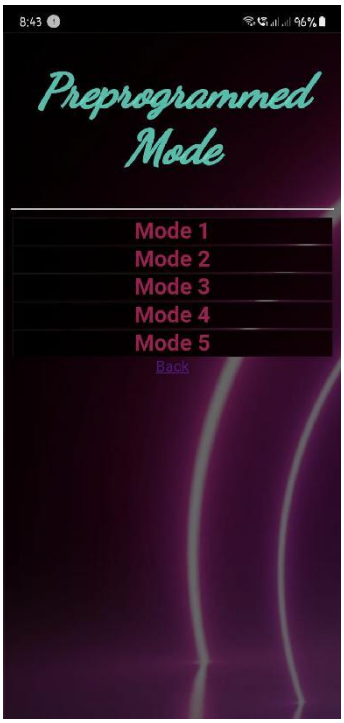
- Ambient light sensor
- Flashlight
- Camera
- Bluetooth
- Screen Orientation

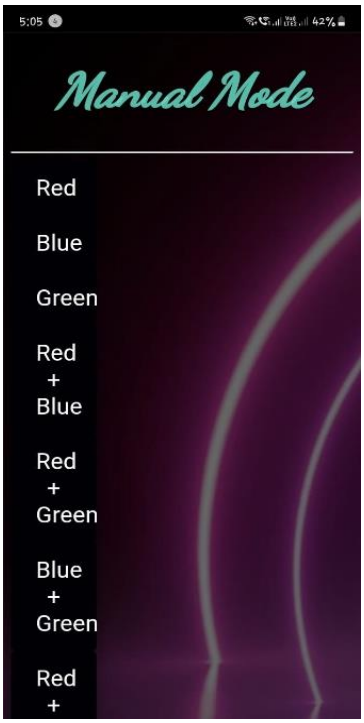
Innovative Output Services used in the app

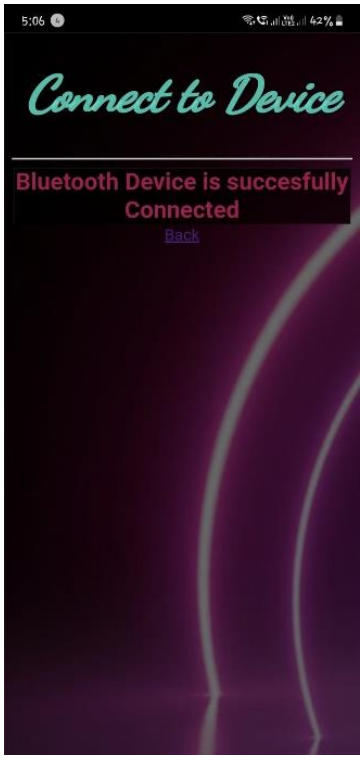
- Sound output – The modes come with an inbuilt background music.
- Flashlight – The users can access the phone's flashlight in mode 1

Screenshots from the prototype








5:06
42%
Connect to Device
Bluetooth Device is succesfully Connected
Back


5:06
42%
Tutorial
Back


5:07
42%
Contact Us
aditi.hiray@stud.th-deg.de
prasad.kalidindi@stud.th-deg.de
mahadev.prem@stud.th-deg.de
tom.jojo-palamattam@stud.th-deg.de
thomas.john@stud.th-deg.de
Back