The background image shows a modern house at night with warm interior and exterior lighting. A swimming pool in the foreground reflects the house and the sky. Overlaid on the image are several digital elements: a red horizontal bar in the top left corner, a blue grid pattern on the pool's surface, and glowing blue lines that resemble data or energy flows. The title 'SMART HOME AUTOMATION SYSTEM' is written in large, white, sans-serif capital letters on the left side.

# SMART HOME AUTOMATION SYSTEM

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Joining Hands with Technology  
MIT Hackathon Presentation 2022



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**MIT WORLD PEACE  
UNIVERSITY** | PUNE  
TECHNOLOGY, RESEARCH, SOCIAL INNOVATION & PARTNERSHIPS



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## Smart Home Automation Hack Team 2

Division      TY ECE VLSI  
School:      School of Electronic and  
Communication Engineering

# About the Idea

## Overview Of Your Idea

To create a system that can automate any house or Facility, by providing complete remote control via a Mobile App, and to use AI to monitor and learn routines.

## Problem Statement

Creating an Easy to Install, Low Cost and Highly modifiable Home Automation System.

## Need Statement

Make a system that users can easily install, use and monitor, while also implementing AI based learning to target and help differently Abled users.

## Existing Solutions

Companies like Schneider Electric and Viki Knows provide solutions for Home Automation but their prices range from 50k to 4 Lacs, with limited Control over the appliances.

## Solution

Our solution is to create a system that uses comparatively less materials, but making the code and Logical Process more Efficient, Both of which will help greatly in providing the same solutions, but in lesser cost.

## USP

Cost of our product will be approximately Half of the market value, Solutions provided by Major Corporations range to a Few Lacs which we will bring into the thousands.

## Impact

The Impact of this product varies from Day to day ease of use to Life Saving Capabilities. It could be a life changer for the differently Abled population, and the Elder population Living alone. Our AI Will monitor their routines, and any abrupt changes could be alerted to loved ones immediately.

## Commercialization

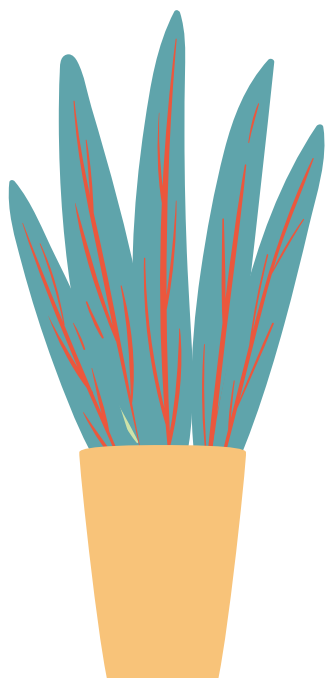
Mass Production of this product is easily Possible. The Circuit Boards would be Printed, and the components assembled and Sealed by Hand, and the User can easily Order this finished product online, while an electrician could install it instantly.

## 5 Year Plan

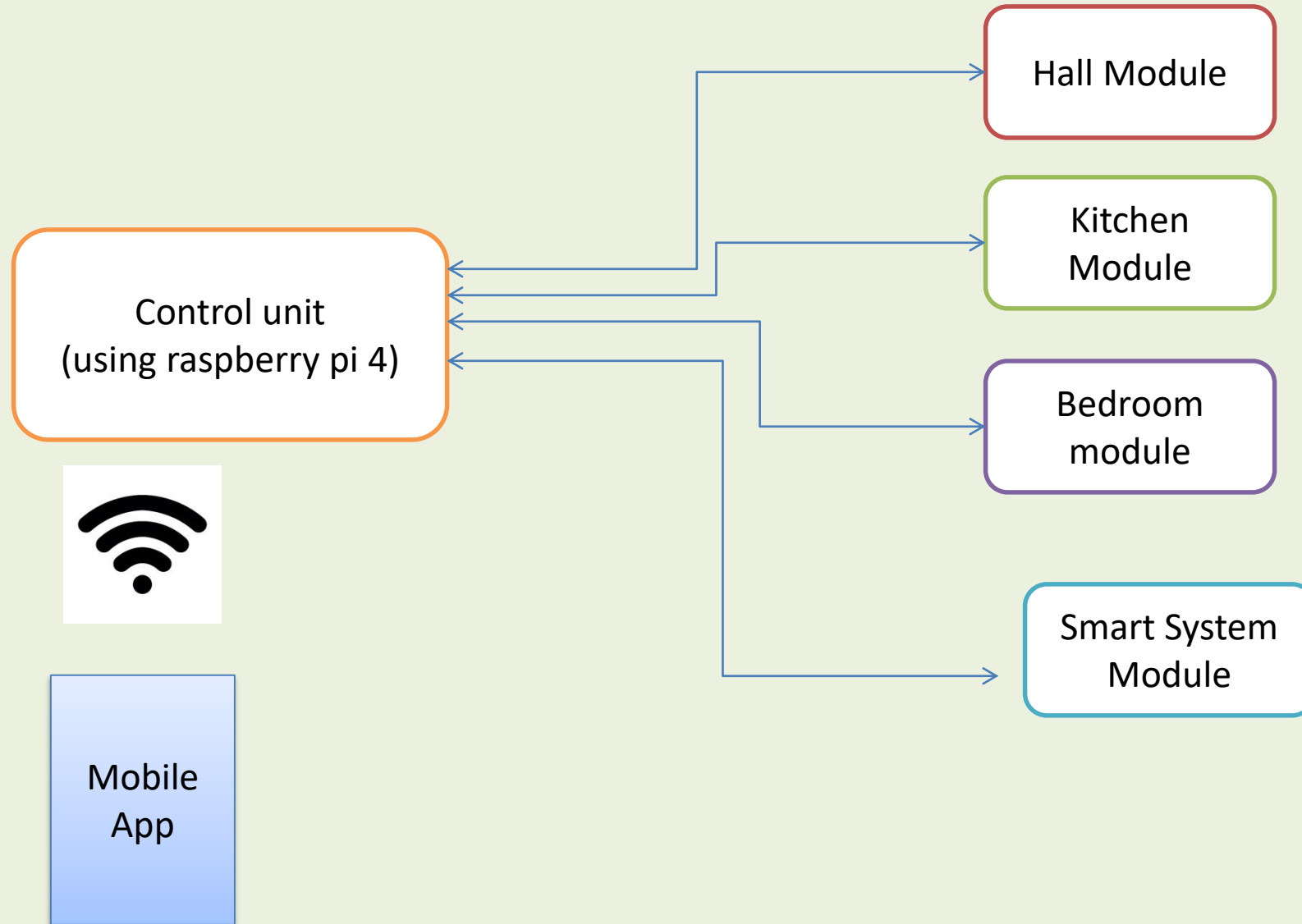
1. We intend to assemble the product by hand for the first Year
2. By the Second Year, Efficiency of the Product will improve as we will cut down the Microprocessors used to only use their relevant circuitry.
3. By the Third Year we will have designed and implemented well Trained and Modelled AI into these Products
4. This AI could be installed into pre-existing Products by simple Software Updates.
5. By the 5<sup>th</sup> Year we intend to completely automate production and thereby increase efficiency.

# 02

WORKING



# Overall system Block Diagram





# CONTROL UNIT

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- It is use for Hardware and software interface between system and user
- It is a main controller of the project



# COMMUNICATION TECHNOLOGY



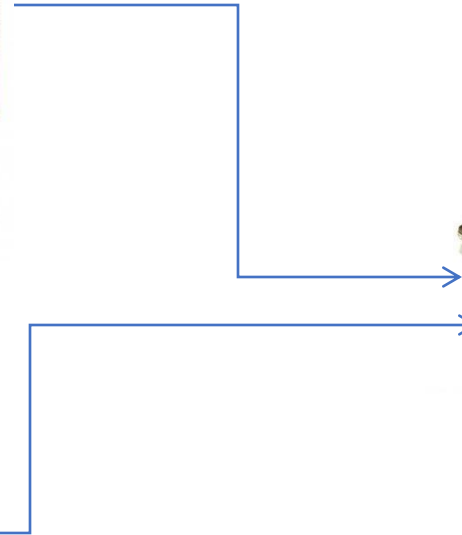
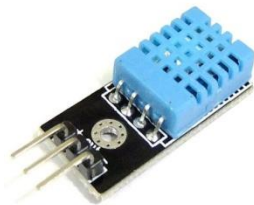
# HALL MODULE

Hall appliances



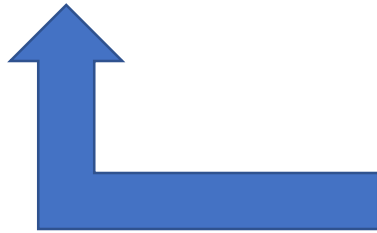
Relay module

Control Unit



# KITCHEN MODULE

Kitchen appliances



Relay module

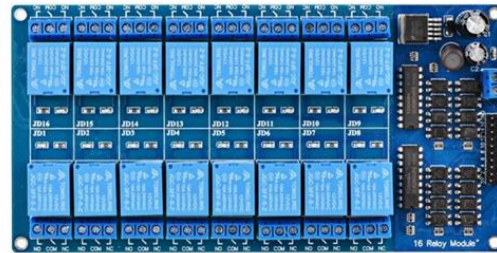
Control Unit



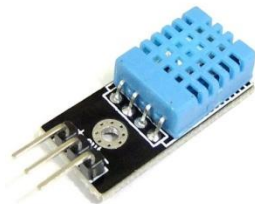
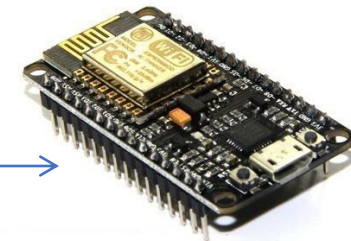
# BEDROOM MODULE

bedroom appliances

Control Unit



Relay module



# SMART SYSTEM MODULE





# *App Design*



# Basic App Design

## SIMPLE LOGIN AND SIGNUP FORM

Login

SignUp

Email

Password

☐ I accept the terms and conditions

LOGIN

Forgot Password

© 2017 Simple Login and Signup Form. All rights reserved | Design by W3layouts



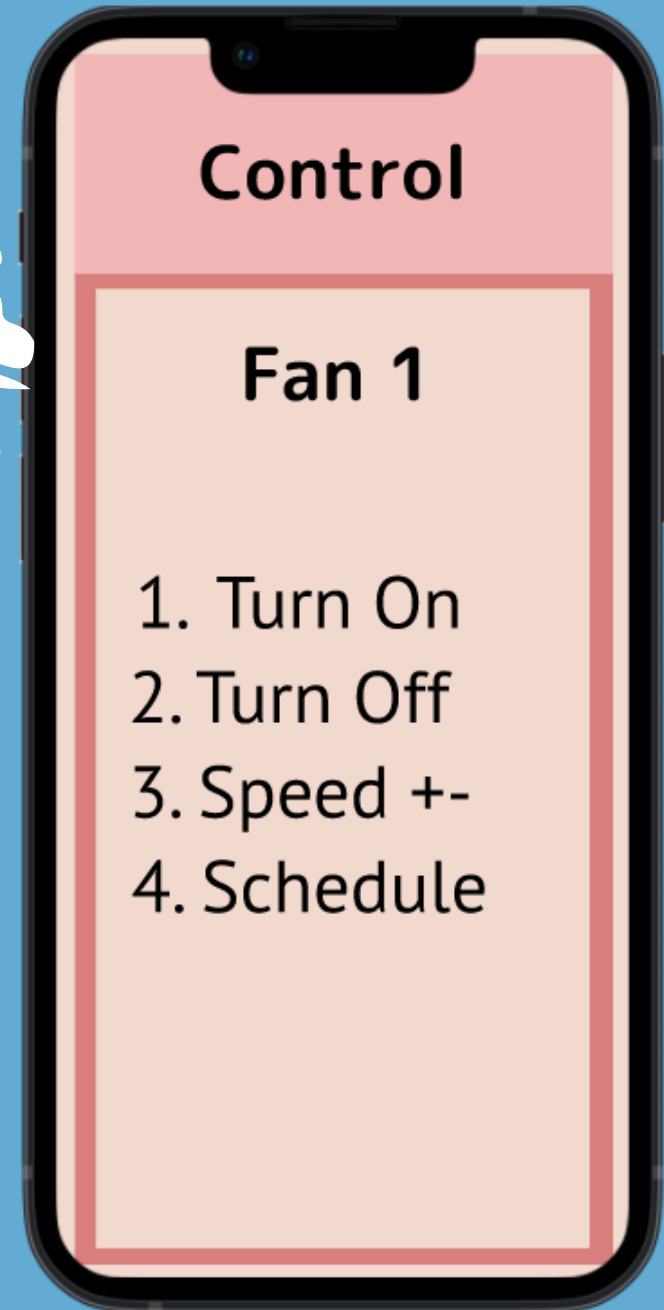
# INTERFACE FOR SELECTING VARIOUS ROOMS IN THE HOUSE



# SELECTION OF VARIOUS APPLIANCES IN THE ROOM



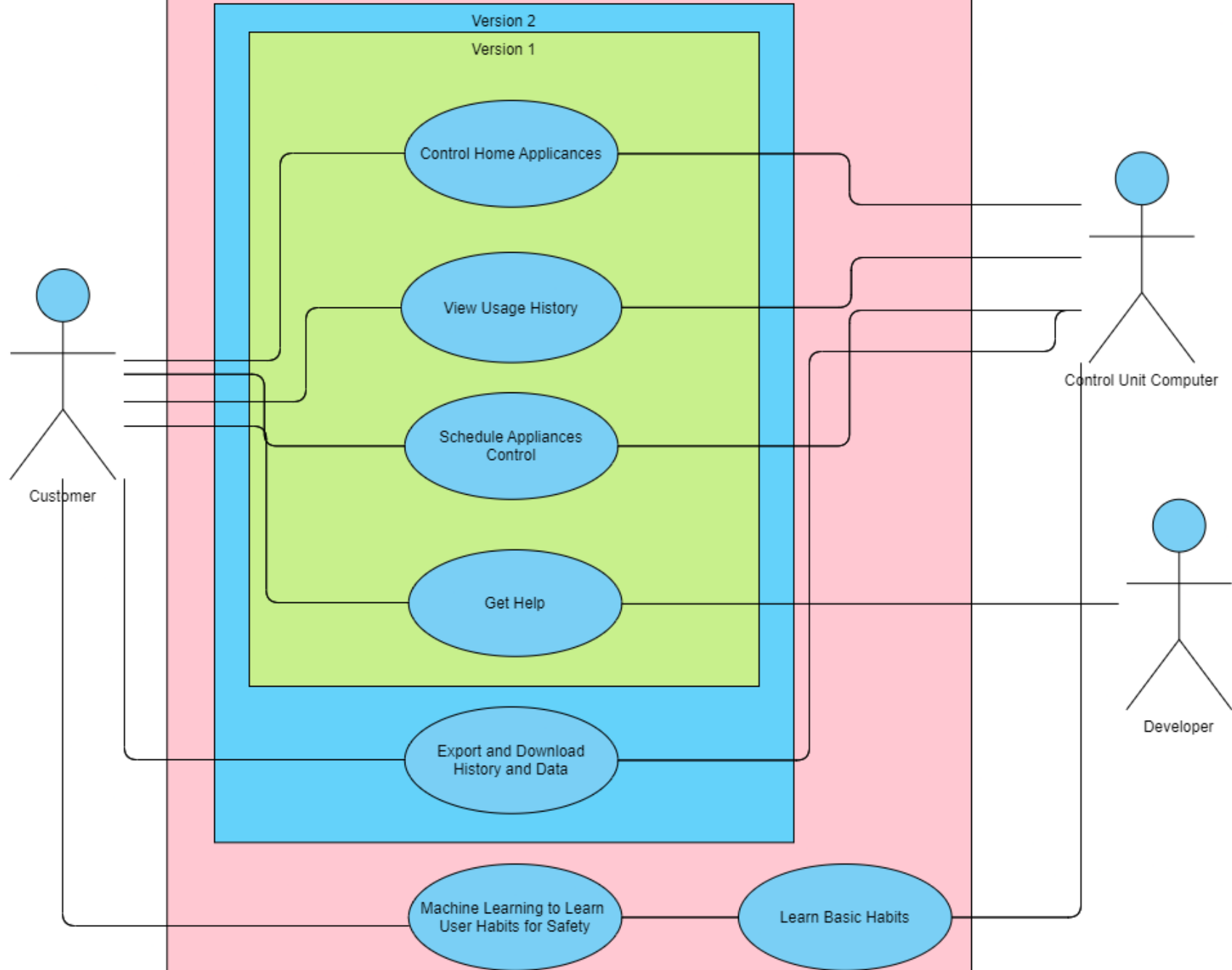
# SELECTING WHAT TO DO WITH THE APPLIANCE



# WORKING DEMO

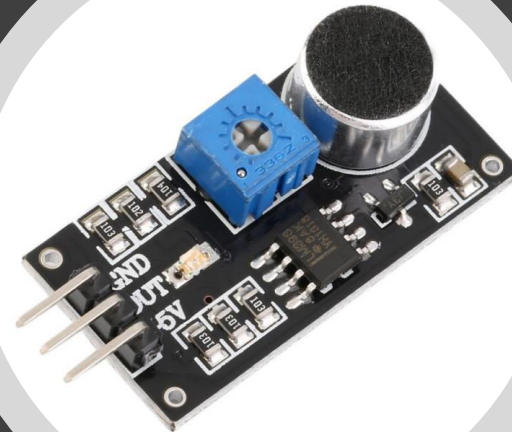
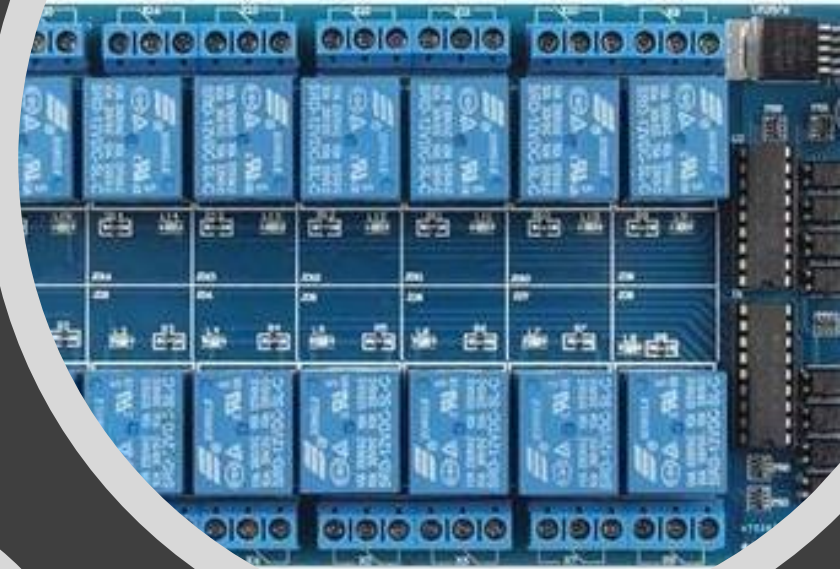


# USE CASE DIAGRAM



# TECHNICAL STACK

1. Raspberry PI 4
2. Mega WOFO R3 Atmega 2500
3. 16 Channel Relay Board
4. Biometric Sensor
5. Ethernet Security Camera
6. Gas, Light, Sound and Proximity Sensors



# SWOT ANALYSIS





# Strengths

- The Product will be a better, more optimal and cheaper solution to automating your home.
- The Differently abled population will be able to control their appliances through voice commands, therefore making their independence more accessible to them.
- The Elderly population, as well as their loved ones can rest assured that they are being monitored and safe.
- The Onset of Diseases and dangerous symptoms can be deduced from a Person's routine and health, this can help in detecting diseases on an early stage, and the App can contact the Ambulance in case of emergencies.



# OPPORTUNITIES

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- The Product will reduce the time taken to manage Home Appliances.
- Appliances will be in safer hands as they are managed by a Protective circuits
- User convenience is a priority and therefore mandates simplified and minimalistic approach in making the app.



# Weaknesses and Threats

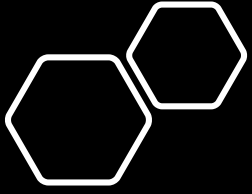
Potential Weaknesses include Malicious software presence on the User's Device. Since Data is secure on the Website and its servers, which are immune to Cyber attacks, the Data is Safe, but specially designed virus could at the worst, maybe mess with the turning off and on of some Appliances.

*User Data, Diagnostics and Central control however will be unharmed at all times.*

03

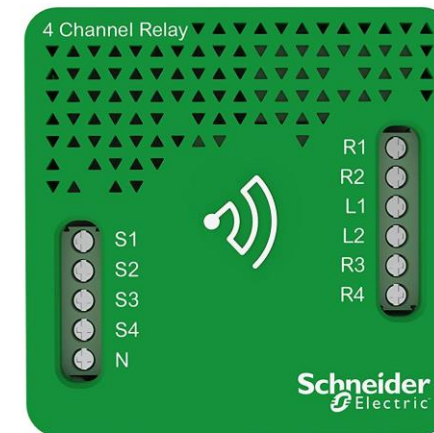
# MARKET ANALYTICS





# Existing Alternatives

Companies like Schneider Electric and Viki Knows provide solutions for Home Automation but their prices range from 50k to 4 Lacs, with limited Control over the appliances.



# KEY METRICS

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We will know how many people install and use our product by the downloads and usage history of the app, that needs to be used along with the product.

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Number of Sales of the Product sold Per number of people reached via Marketing of the Product will give an idea about its success.

“Make your home  
truly your own”

---

One Line to Attract Customers





# 103.000

This is the total Seconds saved per year in managing Home Appliances

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# UNFAIR ADVANTAGE BY OUR SYSTEM

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There are 4 Unfair Advantages that will be provided by our system.

1. Low Cost
2. Using AI to help the elderly, detect anomalies in their routine, make them feel safe.
3. Making life easier for the differently abled population
4. Saving Electricity by efficiently using Home appliances.



# 5 YEAR PLAN

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We intend to assemble the product by hand for the first Year



By the Second Year, Efficiency of the Product will improve as we will cut down the Microprocessors used to only use their relevant circuitry.



By the Third Year we will have designed and implemented well Trained and Modelled AI into these Products



This AI could be installed into pre-existing Products by simple Software Updates.



By the 5<sup>th</sup> Year we intend to completely automate production and thereby increase efficiency.

A large orange circle is positioned on the left side of the slide, partially cut off by the edge.

## Cost Structure

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Production Cost: Approx 40000 Rs

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Website Creation Cost: 3000 Rs.

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Website Hosting Cost: 3000 Rs.

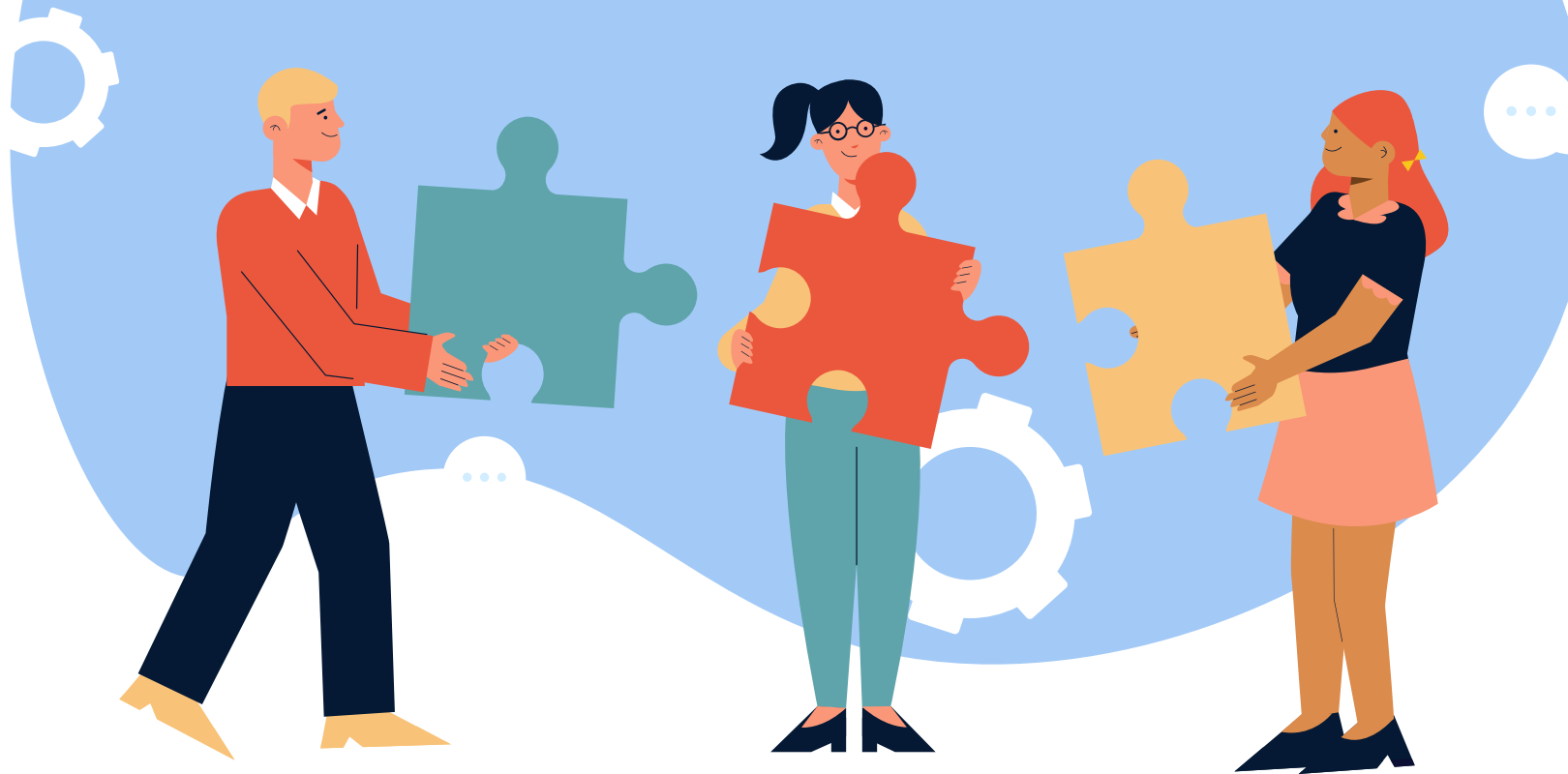
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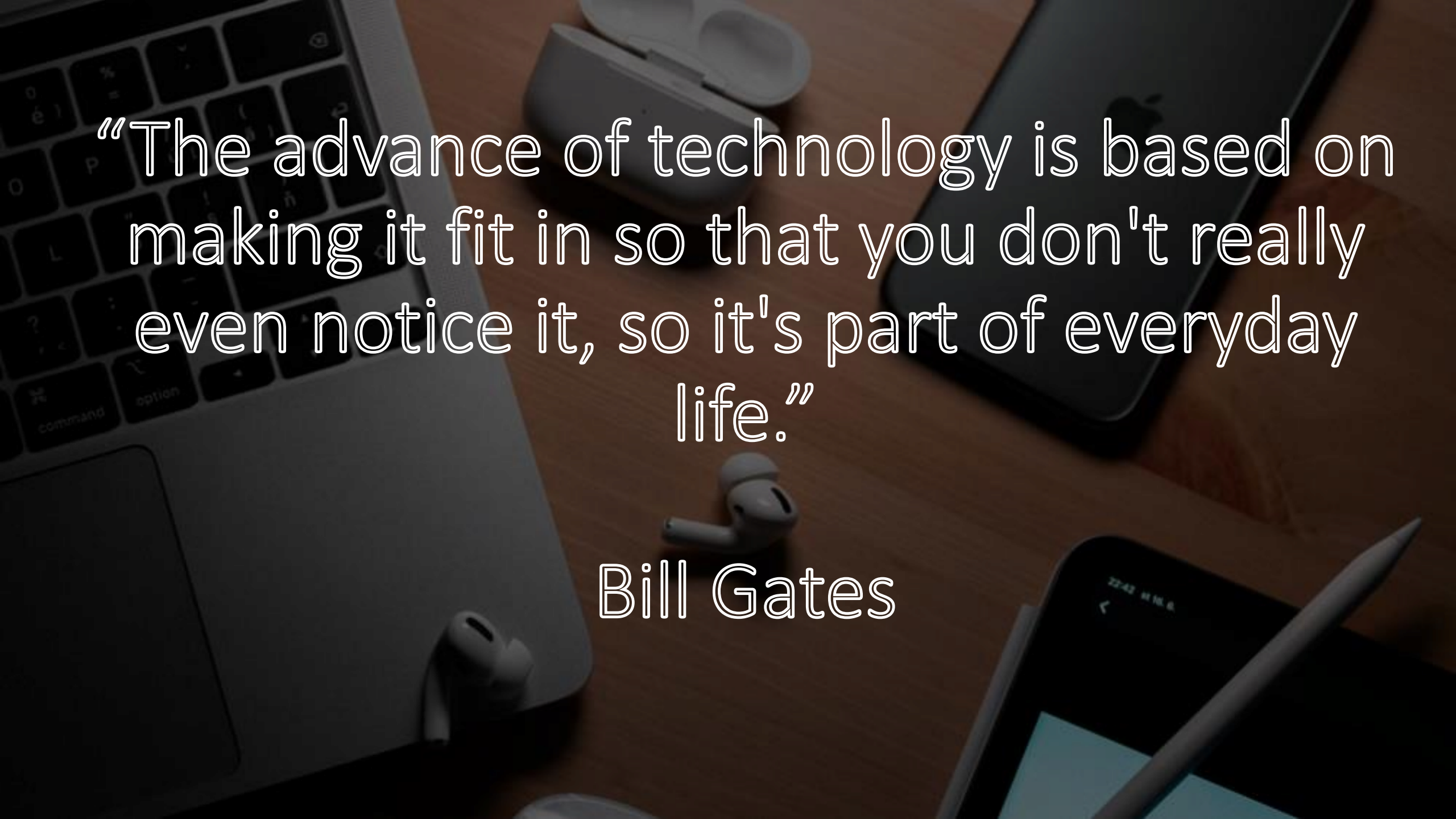
App Creation Cost: 5000 Rs.

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Servicing: 2000 Rs.

# The Grand Scheme of Things





“The advance of technology is based on making it fit in so that you don't really even notice it, so it's part of everyday life.”

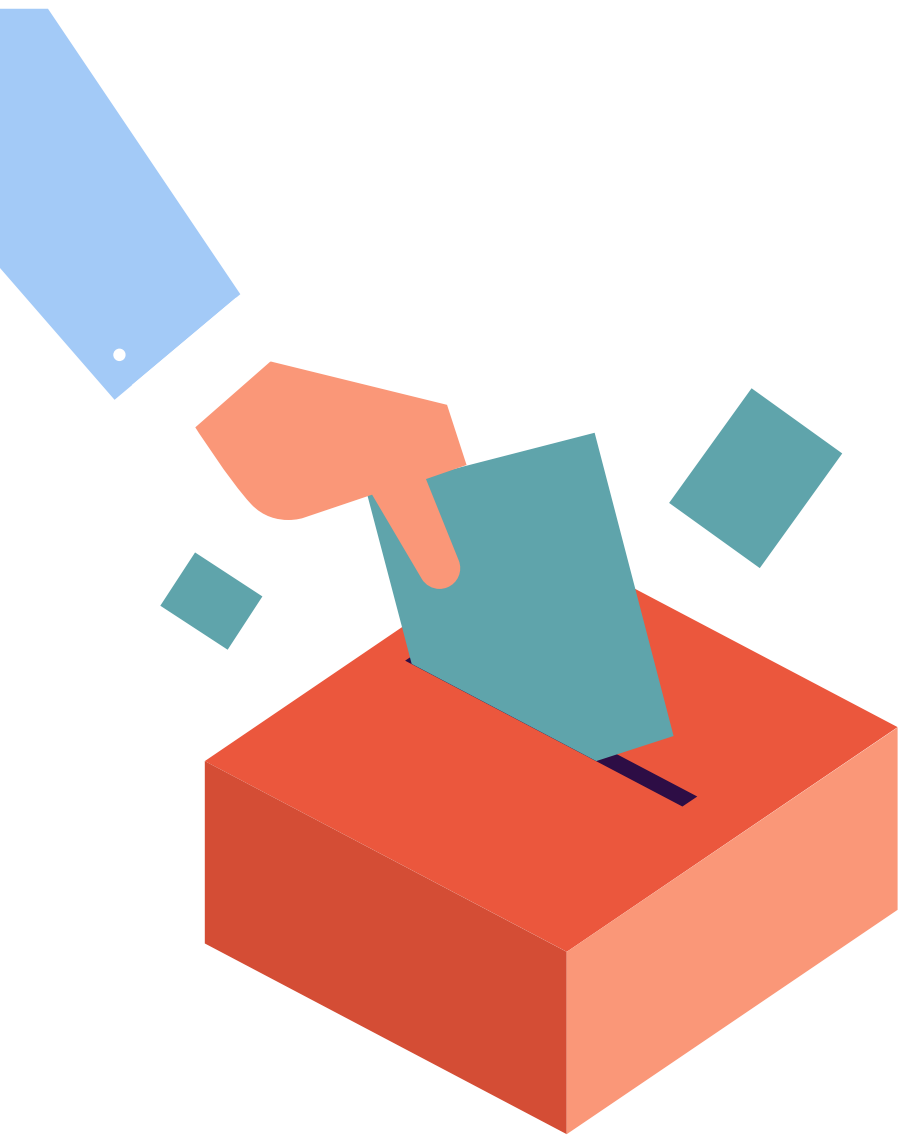
Bill Gates

- The Human Society has always tried to evolve their place of living, and the 'home' has undergone various technological advancements in the past.
- We Hope that our *Project will go down as playing the Key role in that technological advancement of the 21<sup>st</sup> Century*, as It is only a matter of time before we start making full use of technology available to use for our convenience at home.
- In the Grand Scheme of Things, Making Homes smart will be a key turning point, as after such advancement, *The differently abled and the elderly population can find independence and Assistance much more easily.*
- Any Abnormal Activity can be recorded for the user's convenience, and this will also help detect anomalies in routine, behavior, that may pertain to the onset of diseases.

02

# Marketing and Revenue

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if you need it





# Channels of Propagation

1. The primary means of marketing and propagation in the first years will be word of mouth, Instagram and other Social Media Pages
2. In the Later phases of the project, ads for the Product can be placed via Google AdSense.
3. Upon Full scale Deployment, Main Stream ads and Videos can be made.



# REVENUE STREAMS

1

Primary Revenue will be through the main purchase of the Product

2

If a control unit, or a switch board stops working, the replacement parts will cost extra as an Accessory to the Consumer

3

Smart Ads can be incorporated in the app with Google AdSense





Thank you!