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Smart Mirror in Automobile Sector for Business Perspective

CHANAN KUMAR[1], AKSHAY NAIR[2], GIREESH NAIR[3], HRISHIKESH NAIR[4], JINESH MELVIN[5]

[1]BE Student, Dept. of CE, Pillai College of Engineering, Maharashtra, India
[2]BE Student, Dept. of CE, Pillai College of Engineering, Maharashtra, India
[3]BE Student, Dept. of CE, Pillai College of Engineering, Maharashtra, India
[4]BE Student, Dept. of CE, Pillai College of Engineering, Maharashtra, India
[5]Professor, Dept. of CE, Pillai College of Engineering, Maharashtra, India

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Abstract- *Since the early days of computers, scientists have strived to create machines that can rival humans in their ability to think reason, and learn – in other words, artificial intelligence.AI is one of the keys to success in the automotive industry from enabling autonomous vehicles to transforming research, design and manufacturing process. With this vision to have virtualized server running a variety of computer-aided engineering applications, we have built our product. It acts as a virtual assistant in the automobile sector for private transport placed as an in-car Headrest mirror that places calls, plays music show global news, shows live stock market trends, and alarm you the schedules for the day with the help of a to-do list which helps corporates use the time in the travel. It greets you with Launch Phrase after facial recognition and analyses your command with help of a microphone which later converts it to text using an AWS Polly and using AWS Lex a communication model is built to analyze the communication and based on the analysis of the functions make use of real-time data then we make use of APIs.*

Keywords: **Virtual assistant, Headrest Mirror, Corporates, Face Detection, two-way communication, Face Recognition**

1. INTRODUCTION

Presentation and punctuality are two of the most valued qualities in modern society. Yet, it can be difficult to prepare for the day while remaining knowledgeable about current affairs and still maintain a timely schedule. It's imperative to organize for the day when you are in your car while travelling, which is usually a slow process. Additionally, factors such as meetings with the clients, schedule for the day, and venue of the meeting can influence how a person prepares for the day. Finding an efficient way to check all the factors that can affect how a person prepares for the day while also not affecting the tasks that are performed in front of a mirror can be a challenge. The goal of our project was to create a product that will provide quick and easy access to the time, news, and weather while allowing a person to go through their morning routine. Our product should enhance productivity while providing a functional and enjoyable user experience.

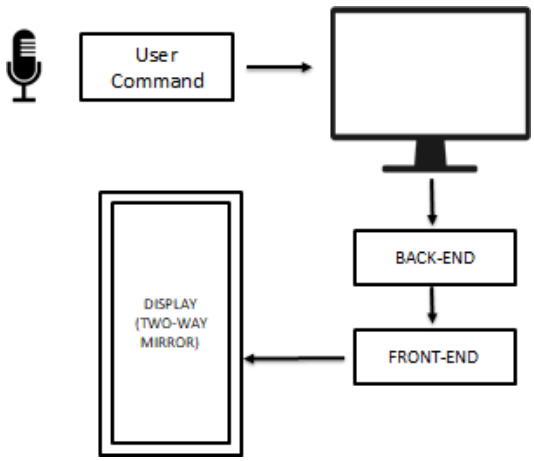

Fig 1: Two way Mirror

A Two-Way mirror is placed on the display module which acts as a simple mirror when there is no light behind it but when the display is turned on it acts as an information provider. When the mirror is powered on it fetches various real-time data from the internet and brings into your mirror-like music, weather, upcoming holidays, some of your other social tools like Twitter feeds, some news headlines, and your schedule for the day. For displaying information we are going to design our customizable UI.

2.1. LITERATURE SURVEY

(A) O. Gomez-Carmona and D. represents the design and implementation of a multi-user a sensible mirror system conceived to market wellness and a healthier lifestyle within the work environment through persuasive strategies. The interactive mirror recognizes different users through their corporate ID card, which allows them to possess access to their personalized a user-interface. The smart mirror provides workplace indoor environmental conditions (thermal, humidity, and light), personal workout data obtained from wearable devices, and general-purpose information (e.g. weather and daily news). Additionally, motivational advice related to physical performance is supplied through an invitation by applying a speech-based recognition technique. During this project, the event of Smart Reflect took place at a software platform

for developing smart mirror applications. The most features of Smart Reflect are threefold:
(1) It is modular, lightweight, and extensible;
(2) It allowed developers to sidestep the sandbox's environment created by web browsers; and
(3) It supports plugins written in any programming language. These improvements ease the hardware and software limitations inherent with the utilization of web browsers as a primary scriptable display method. During this paper, they described the planning and implementation of Smart Reflects and compares it with other similar platforms

(B) Lakshami N M, Chandana M S, and Ishwarya P
Proposed a smart mirror system that represents an elegant. Interface for glancing information and is also used for thief detection in a home environment. A smart mirror may be a system that functions as a mirror with the extra capability of displaying date, time, current temperature, weather details to style a wise mirror that receives a piece of online news and display it using Artificial Intelligence and machine learning circuitry and to detect thieves when nobody is in a home.

(C) M. M. Yusri et al. created a sensible Mirror system which allows users to access information and also control the lights within the house. Relevant information can be traced such as time and date, weather, warning, traffic, and location map. The system applies Sonus technology as a medium of interaction between people and systems. So, users got to provide instructions to the system orally to accumulate the system's response. Sonus is a speech-to-text library that can quickly and easily add a VUI (Voice User Interface) to any hardware or software project. With this Smart Mirror system, users can manage their daily activities comfortably also solving many problems in managing some house chores.

(D) Vaibhav Khanna, Vash Vardhan, Dhruv Nair, and Preeti Pannu proposed the interactive mirror with properly embedded intelligence for offering enhanced features such as weather of the city, latest updates of news and headlines, and local time corresponding to the location. The Smart Mirror would help in developing smart houses with embedded AI, also as finding its applications in industries. Ambient Artificial Intelligence (AmI) is a technology used in the proposed smart mirror.

(E) Chidambaram Sethukkarasi et al. (2016) created an intelligent mirror that identifies the user using facial recognition technology and provides services such as recognizing emotions, progress representation of measured health parameters, height identification, identify garments, suggest garments with a suitable colour, and reminds important events. Their paper does not go in-depth on any of its subjects, but rather tries to unite the ideas under the concept of an intelligent mirror.

2.2. LITERATURE GAP

It has been observed that though there is Smart music player integrating facial emotion recognition and music mood recommendation product which uses CNN to recommend music based on user real time mood but it does not recommend music in other languages other than English. Though there is Passenger information System with virtual assistant images there is no Infotainment Service available. Also, there is Lack of intelligence and classification of intent in term of sentence is not fluent.

3. SYSTEM SOFTWARE DESIGN

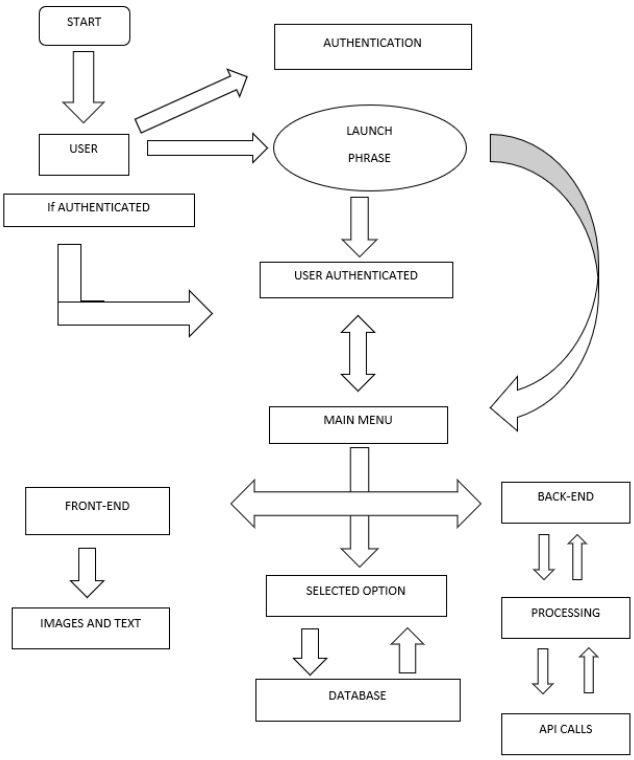

Fig 2: Software Design

When the mirror is powered up a beautiful User-Interface is ready to be see and to use. The User-Interface can be operated both with voice and touch. After initializing all model and loading all the trained model for facial recognition, User face is been detected and been recognize and will be greeted. Facial-Recognition is done with the help of tenser flow model. A flask server has been set for tenser flow model. For training of the model an image is sent and the image is converted into 128-dimensional vector which can be later been used to verification purpose. ReactJS application could communicate with our deep learning model with the help of the Flask server. But, if the user is not verified the user will not be able to access many things like TO-DO list and live-stock updates, recommending songs on mood and many things and

access will be limited to news headline, maps, song playback.

4. SYSTEM UI DESIGN

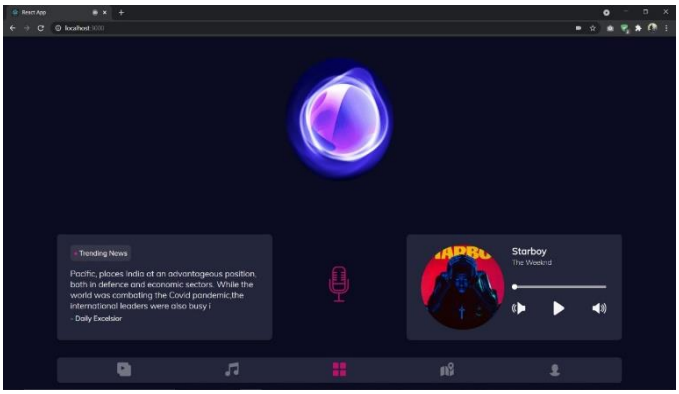

Fig 3: Homepage Ui

All the information will be initialized in the UI that shows the schedule for the day i.e. to-do list, news headlines, upcoming holidays, date, time, weather, and other socializing tools required for a person in the travel. API-like news, the weather provides some Real-Time data that contributes to the features of the product.

User can just communicate with the ReactJs App and have access to features such as jokes, greeting messages, placing calls, etc. User can ask the product to play music for them, set a schedule for the business day, show all the global news headlines, and show the stock-market trends and their updates. Here, the data for Stock Market prices are fetched from the internet using WebSocket. The data for News Headlines are fetched from APIs.

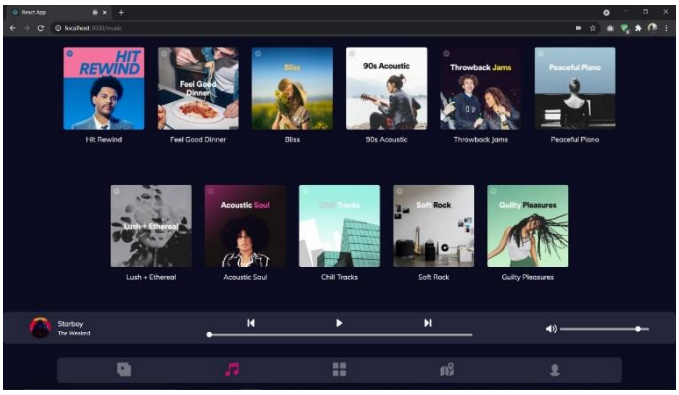

Fig 4: Music Ui

Emotion detection is done with the help of tenser flow. It helps the product to recommend song to the user when the user ask for it.

5. IMPLEMENTATION

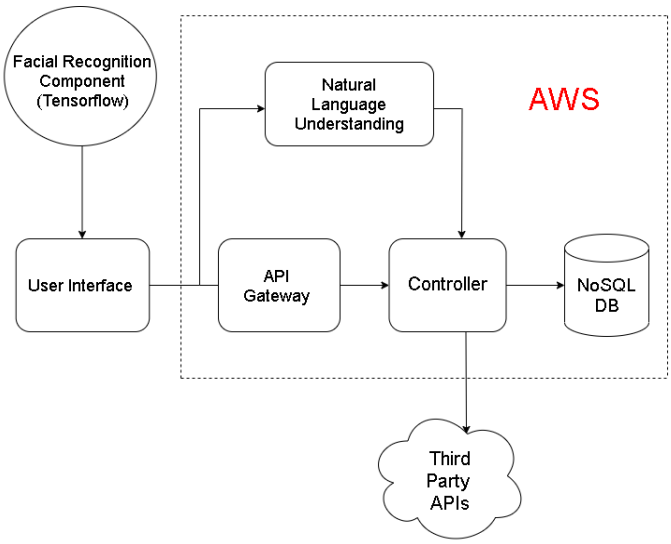

Fig 5: Flow of the System

In order to recommend songs to the passengers based on their mood, we are using Tensorflow.js. We will get the current mood of the passenger by this and if the mood is seen to be sad, then the virtual assistant would ask the passenger if she can recommend some music to them.

The Backend/Controller Services are written in Node.js and are deployed using AWS lambda. AWS Lambda is a server less compute service that lets you run code without provisioning or 10 managing servers. It runs your code just when required and scales consequently, from a couple of requests for every day to thousands every second. You pay just for the processing time that you consume. There is no charge when your code isn't running.

Here we train the model by first defining the intents that will be performed by our assistant. An example of an intent could be, "Play Music", "Current Weather". Each intent will require one or multiple utterances that are used to activate or kick off the intent. Utterances are the input from the user which the model needs to derive intents and entities from. To train Lex properly so that is accurately extract intents and entities from the user's dialog input, we have provided a bunch of different example utterances for each and every intent.

We communicate with various external APIs to perform various tasks. Some of the APIs that which we are currently using are Spotify, Bing, YouTube and Google Maps API. API is the acronym for Application Programming Interface, which is a software intermediary that allows two applications to talk to each other. Each time you use an app like Facebook, send an instant

Message, or check the weather on your phone, you're using an API.

CONCLUSION

The product we have designed is similar to a virtual assistant which can be used by corporates in their private vehicles. We have overcome the lack of intelligence and have provided the classification of intent in terms of sentences fluently. We have met the goal to help the corporate private car owners by providing them a cheap application that will perform as a Virtual Assistant with all the infotainment features. To make this product affordable, we are leveraging the server less architecture of the cloud (AWS) which drastically reduces the infrastructure costs.

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