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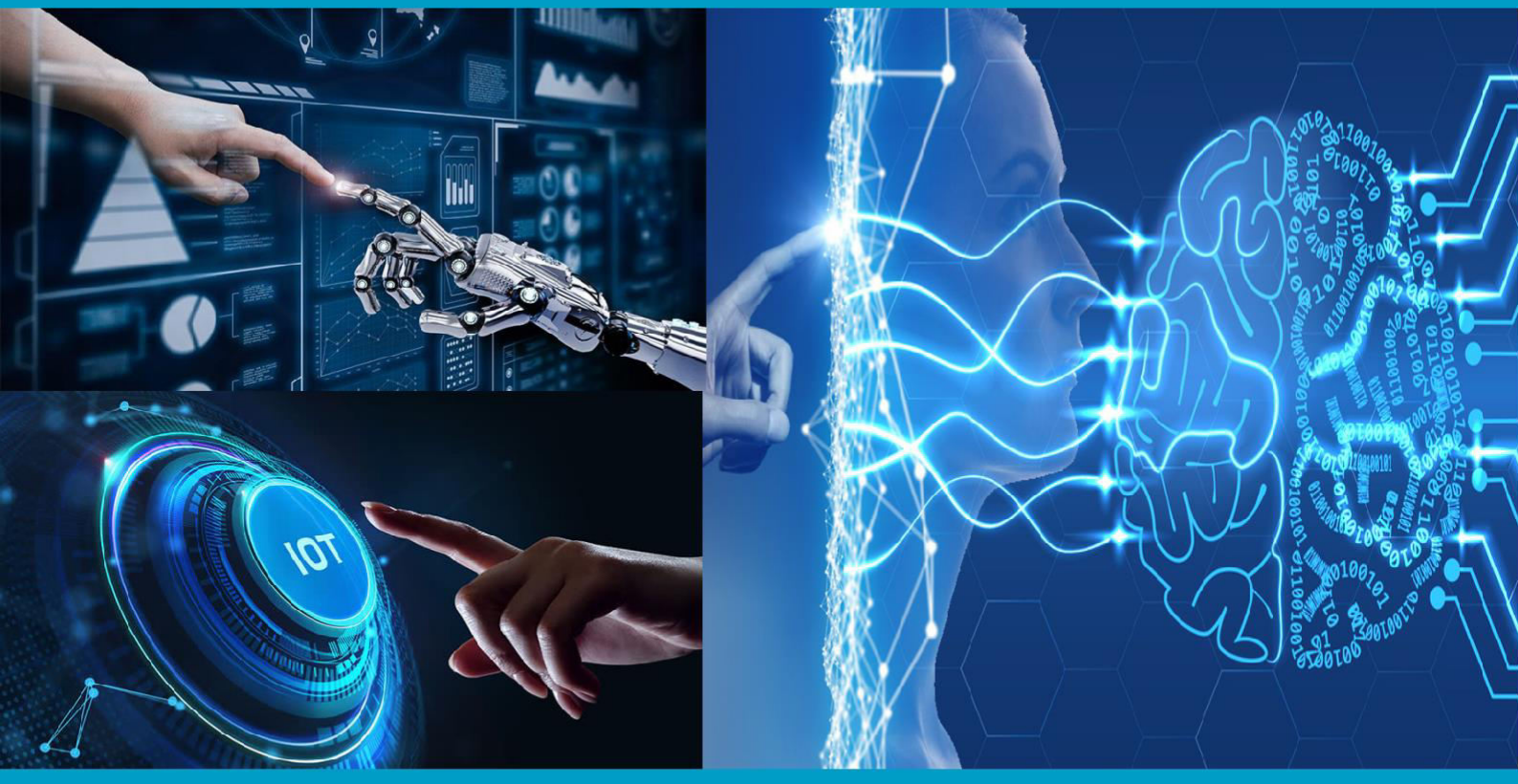

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Home Automation Using AI and IOT

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ABSTRACT : The IoT network's massive data flows and storage can be easily managed with AI. IoT is currently growing more and more popular because to the development of high-speed internet networks and several cutting-edge sensors that can be incorporated into microcontrollers. The data that is now flowing across the internet includes user data that is sent and received from workstations as well as sensor data.

Fewer data may really be experiencing challenges on the storage side, latency, channels limitation, and suffocation inside the networks due to the increase in the number of workstations and numerous sensors. Over the past ten years, several algorithms have been presented to prevent these issues.AI is still the only algorithm that can manage and regulate network congestion in addition to mining information. This paper's purpose is to demonstrate how an AI system is being used in the Internet of Things. The study emphasises the significance of information management and mining.

Additionally, the approach used in synthetic intelligence, such as fuzzy logics or neural networks, will be examined in this study in relation to IoT network. The software in specified networks and self-modifying networks are some of the essential parameters in the AI IoT System.

KEYWORDS*:* IoT Implementation using Artificial Intelligence as Google Assistant

I. INTRODUCTION

Millionaires used human helpers like housekeepers in the past to maintain their properties.

Only the wise people in society are greatly fortunate with these new smart home device applications nowadays when technology is so readily managed, since these device applications costs are a little high. However, not everyone has the financial resources to buy a personal assistant or a smart home kit. Therefore, the need for finding an inexpensive and intelligent helper for typical families is increasing. We have developed a solution that is affordable. The primary components are the Google Virtual Assistant, the IFTTT web application, the Blynk programme, and the NodeMCU microcontroller.The Google Assistant receives orders in natural language speech.

This method falls under the Internet of Things since all the gear is wirelessly connected to the internet. The effort required to utilise a household appliance requires moving it over physically, which is why there is interest in making them easier to handle and operate. The possibility of controlling household appliances is genuine, and it both saves time and makes it simple for anybody in the globe to access the appliances.

II. PROBLEM STATEMENT

People today are looking for methods to improve their quality of life while utilising the most recent technologies.

Consumers will use any modern facility or device that promises to safeguard their way of life. It becomes necessary to provide simple and convenient ways to use and control these devices or appliances when more of these facilities and appliances are installed. The typical wall switches or buttons are scattered around a house, necessitating manual operations like turning on or off different appliances. Monitoring the status and operation of operating appliances or devices becomes exceedingly difficult, if not impossible.

III. EXISTING SYSTEM

The first smart houses were only ideals and not actual buildings. The idea of house automation has been explored in imagination for many years. Writers who were prolific anticipated a day where dwellings might communicate and appear to carry out their own functions. In his cautionary tale "There Will Come Soft Rains," Bradbury himself

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envisions an autonomous house that keeps running long after humans have vanished from the planet. The concept of home automation has been around for some time, but practical smart houses have only been available for a short period. This specific timeline concentrates on hardware, that is, genuine technologies that preceded the smart houses that we are all familiar with now and may soon anticipate.

IV. WORKFLOW

The project's flow is depicted in the above diagram. In which the user has a mobile application on his phone via which the user's behaviour is recorded in a cloud database. The system builds a pattern of the user based on the data saved in the cloud database, and AI is then implemented based on that pattern. The IoT system then executes the action based on the AI's output after receiving it from the AI. The user may manually operate the IoT system using an application, allowing them to do so in accordance with their demands.

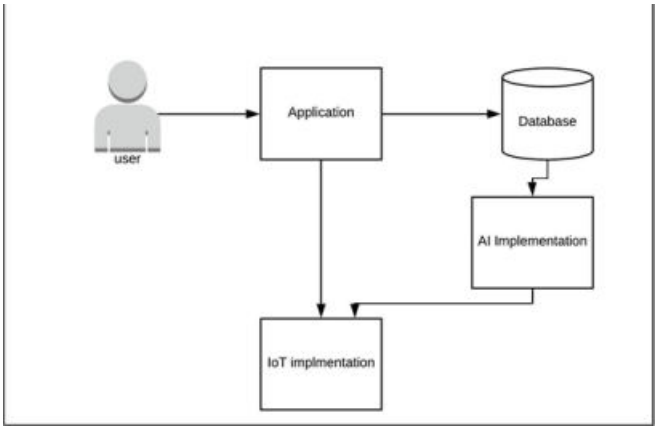

Fig -1: Workflow of proposed system

V. MODULES

5.1: Module 1: Login

The user needs to login in their account by the provided username and password so they can access the Blynk App and can create even their own buttons for the devices they wants to control. The Login username and password can be changed even after the installation of the device.

5.2: Module 2: User Interface

After completing the login procedure, the user may operate the NodeMCU-connected devices using either the manual controls that are offered or the AI alternative, Google Assistant. Three different system kinds can be observed or tracked separately on this user interface. Each of the three user interfaces performs a separate task and can display data to the user based on machine input.

5.3: Module 3: Devices

If the user installs new devices and wants to upgrade the system module, the devices that are linked to the NodeMCU can also be modified. These devices may be updated by the user himself using a very simple GUI.

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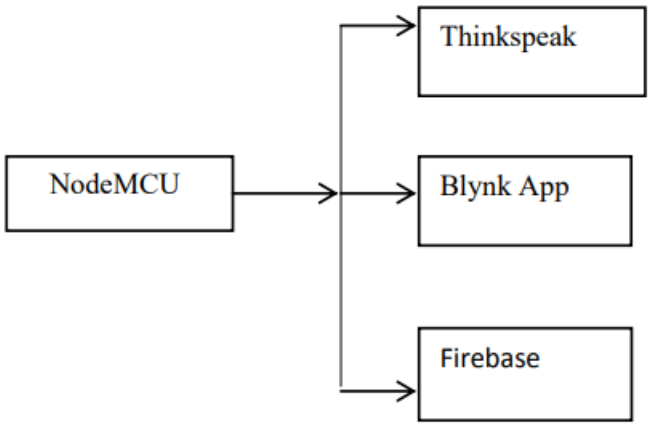

Fig -2: Customer User Interface

VI. FLOWCHART

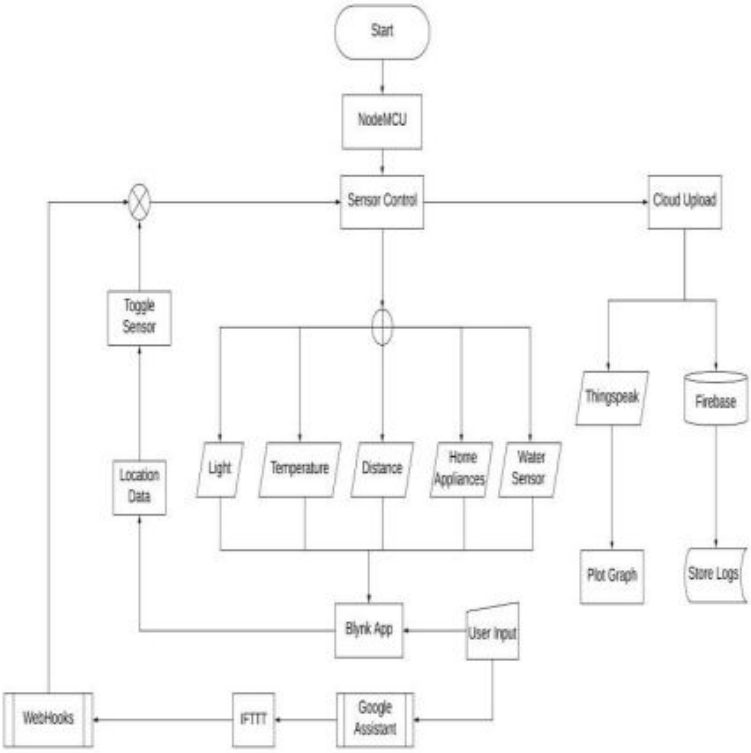

Fig -3: Flowchart Diagram

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VII. CLASS DIAGRAM

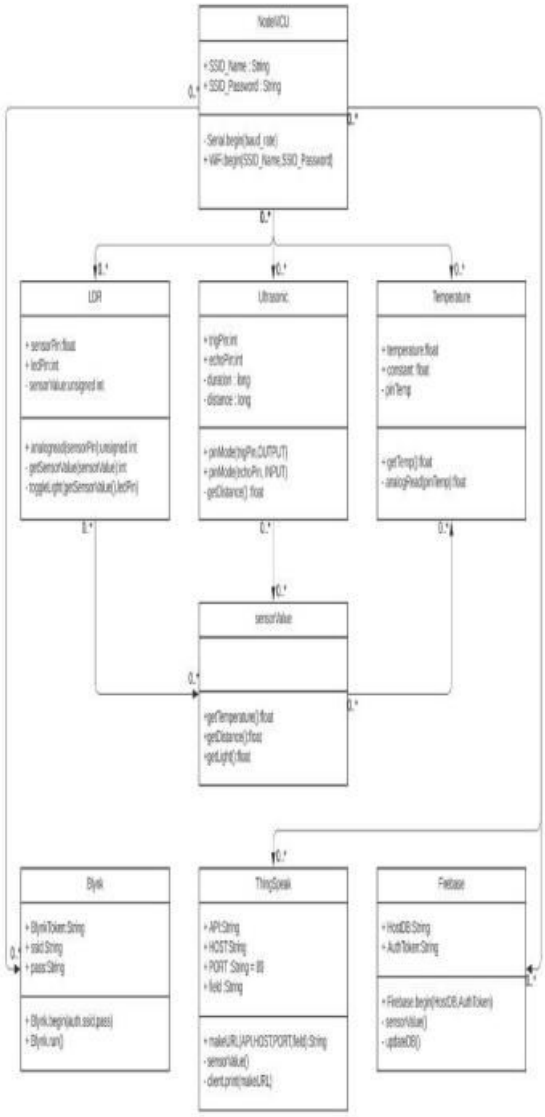

Fig -4: Class Diagram

VIII. BASIC ARCHITECTURE

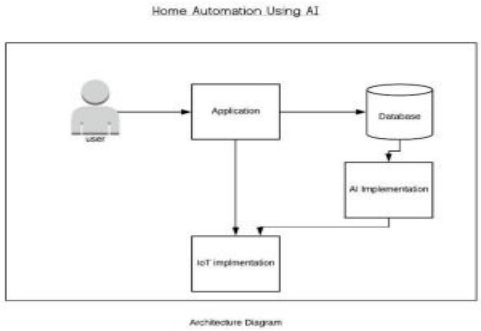

Fig -5: Basic Architecture

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IX. USECASE DIAGRAM

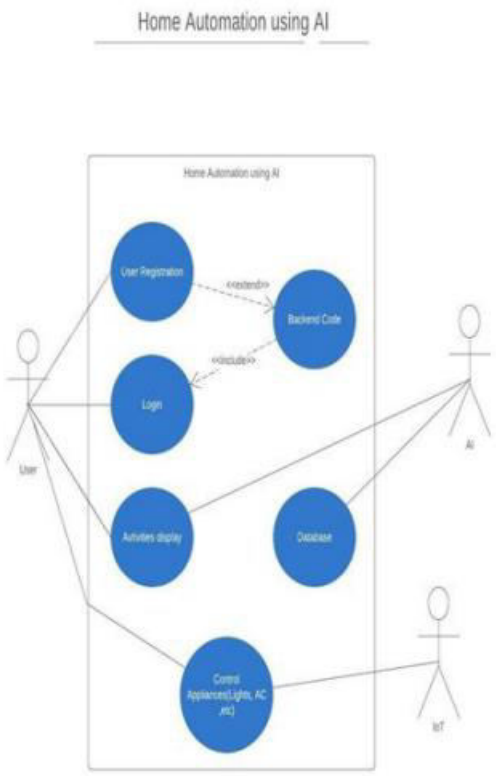

Fig -6: Use Case Diagram

X. TEST CASES

Id.	Description	Test Steps	Test Data	Expected Output	Actual Output
T-01	Check if the Sensors are connected properly	Connect the pins of the sensors with the Arduino	Light Sensor, Ultrasoni c sensor and Arduino	It should show the desired readings	Actual readings shown
T-02	Check if the data of the sensors are storing in the cloud	Connect the Arduino to the network.	Arduino to the network. Arduino code, Cloud configura tion	It should store the data in the cloud database	There are no readings stored in the cloud storage. Storage failed
T-03	Check if the sensors are managing the appliances	Connect the sensors to any appliance through an wired connection.	Sensors, LED (for appliance s)	The LED should be on if the sensors reading are calculate d.	LED is enabled.
T-04	Check if all the sensors are working together in a local network	Connect the sensors to multiple appliances which can be controlled by	Sensors, LED (for applianc	All the LEDs should be on after the sensors reading are calculate d.	All the LEDs should be on after the sensors reading are calculate d.

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		the reading of the sensors.			
T-05	Check if all the sensors are working together in a local network	Connect the sensors to multiple appliances which can be controlled	Sensors, LED (for appliance s)	All the LEDs should be off after the sensors reading are calcula	All the LEDs are turned off.

Table No.1 : Test Cases

XI. CONCLUSIONS

A common and easy-to-use control over household electronics and appliances is provided by the home automation system, which uses inexpensive hardware and a clever, intelligent system. The development of personal assistants, in this example Jasper, has eliminated the need for additional devices like cellphones or Bluetooth-enabled gadgets. The elderly and others with disabilities can get assistance and direction from the hands-free operation of the appliances.

The primary goal of the project is to enable an Intelligent System to make day-to-day household choices as the area of home automation develops. The Intelligent System runs and responds to the user's question using Natural Language Processing. The created AI is utilised to obtain information from the Internet based on the inquiry in addition to operating the devices.

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