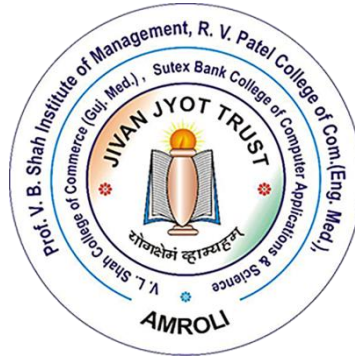


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**(Accredited 'B' (CGPA 2.55) by NAAC Dec.-2009)**

**VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT**



**SEMINAR REPORT**

**ON**

**SMART HOME SYSTEM USING IOT & AI**

**AS A PARTIAL REQUIREMENT FOR THE DEGREE**

**OF**

**BACHELOR OF COMPUTER APPLICATION**

**(B.C.A.)**

**SUBMITTED BY:**  
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## Certificate

This is to certify that the seminar presentation and report titled “**Smart Home System Using IOT & AI**” is the bonafide work carried out by **Sagar M. Pipaliya (442)** student of TYBCA Sem-VI of Sutex Bank College of Computer Application and Science, Amroli, (Surat) affiliated to Veer Narmad South Gujarat University. He has successfully completed his seminar work in partial fulfillment of the requirements for the award of the degree of "Bachelor of Computer Application" during the academic year 2018-2019.

\_\_\_\_\_  
**Asst. Prof. Rinku J. Thakkar**  
Seminar Guide

\_\_\_\_\_  
**Dr. Mukesh Goyani**  
In-charge Principal

**Date:**

**Place:** Amroli, Surat.

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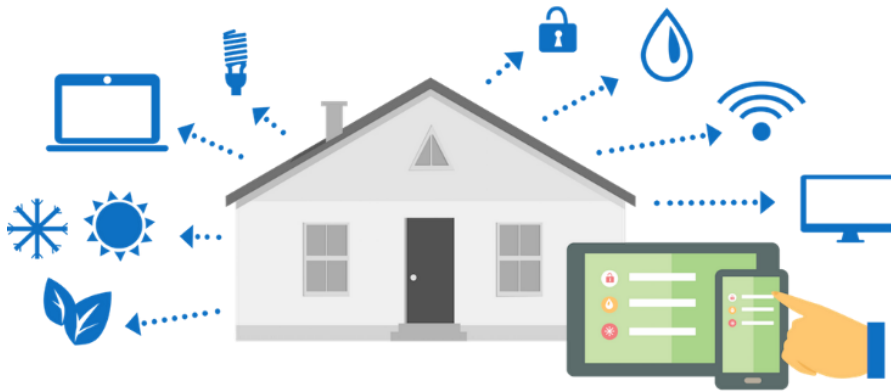
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## HISTORY OF SMART HOME

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- Early smart homes or home automation began a long time ago. It really all began when human beings figured out how to make their life easier and invented things that made it simpler, more effective, and less exertive and less time to accomplish tasks.
- Home automation truly began with machines that replaced human labor in the home that made peoples lifestyles easier and allowed them more time for their family, other things, relaxing or simply enjoying life.
- Smart home technology, also often referred to as home automation, provides homeowners security, comfort, and convenience and energy efficiency by allowing them to control smart devices, often by a smart home app on their smartphone or other networked device.
- A part of the internet of things (IOT), smart home systems and devices often operate together, sharing consumer usage data among themselves and automating actions based on the homeowner's preferences.
- **Examples of smart home technologies :**
  - **Smart TVs** connect to the internet to access content through applications, such as on-demand video and music. Some smart TVs also include voice or gesture recognition.

- In addition to being able to be controlled remotely and customized, [smart lighting systems](#), such as Hue from Philips Lighting Holding B.V., can detect when occupants are in the room and adjust lighting as needed. Smart lightbulbs can also regulate themselves based on daylight availability.
- Using [smart locks](#) and [garage-door openers](#), users can grant or deny access to visitors. Smart locks can also detect when residents are near and unlock the doors for them.
- With [smart security cameras](#), residents can monitor their homes when they are away or on vacation. Smart motion sensors are also able to identify the difference between residents, visitors, pets and burglars, and can notify authorities if suspicious behavior is detected.
- [Pet care](#) can be automated with connected feeders. Houseplants and lawns can be watered by way of connected timers.
- [Kitchen appliances](#) of all sorts are available, including [smart coffee makers](#) that can brew you a fresh cup as soon as your alarm goes off, [smart refrigerators](#) that keep track of expiration dates, make shopping lists or even create recipes based on ingredients currently on hand.
- Smart Home has become the revolutionary ladder of success in the residential spaces and it is predicted Smart homes will become as common as smartphones.

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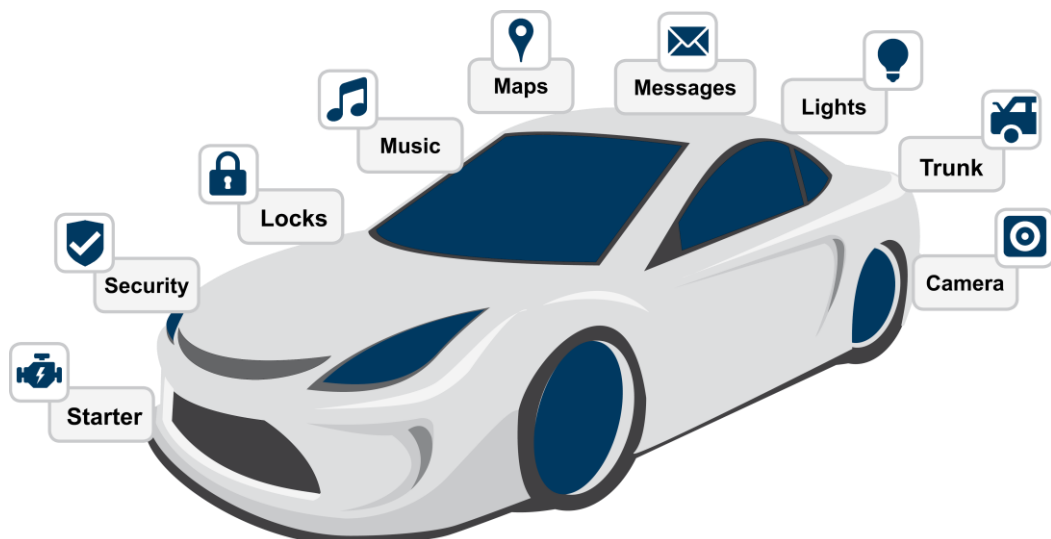
## WHAT IS IOT?

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- Human beings today have come very far ahead of the early- man ages when they had to manually engage in the completion of all their needs and requirements.
- Today life has become simpler, faster as well as more convenient than it ever was.
- **The Internet of Things technology** also commonly known as **IOT** is a way of connecting all the devices and objects around us into a common cloud network.
- Through the advent of this technology, we will be able to communicate as well as send/ receive data across this network without the need for any human intervention.
- Internet of Things technology will be major technological reforms in the world we are living in.

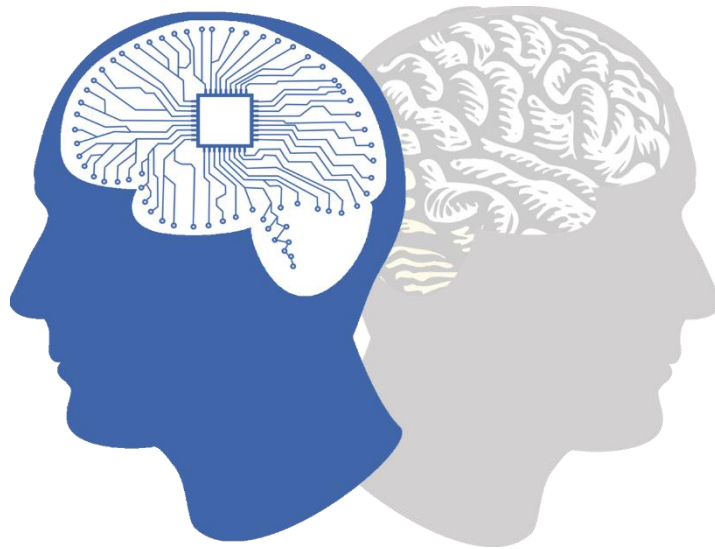
- The IOT technology will make it possible for all kinds of human to human and machine to machine communications to take place on their own. This means that there will be faster, hassle- free as well as accurate transmission of data between two different entities.
- **For Example :**
  - Right now you can listen to just about any **song in the world**, but it's not because your phone actually has every song in the world stored on it. It's because every song in the world is stored somewhere else, but your phone can send information (asking for that song) and then receive information (streaming that song on your phone).
  - For the whole **cities**, the basic IOT applications include smart parking, structural health, smart lighting etc. Even though this group of IOT applications is rather on the development stage than a reality, the perspectives of safety increase and the promises of smarter traffic and pollution control make its real-life emergence inevitable.
  - **Vehicles** that are able to detect the best route in real time by a city to avoid jams or traffic lights.



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## WHAT IS AI?

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- Artificial intelligence (AI) is an area of computer science that emphasizes the creation of intelligent **machines** that work and react like **humans**. Some of the activities computers with artificial intelligence are designed for include: **Speech recognition**, **Learning** etc.
- **For Example :**
  - **Amazon Alexa.**
  - New method of human-computer interaction makes powerful computer applications even easier to use and accessible to more people. Before, you may have needed to make several swipes and clicks to complete a task. With voice, you can complete a task by simply saying, “Alexa, play the top songs in Seattle.”





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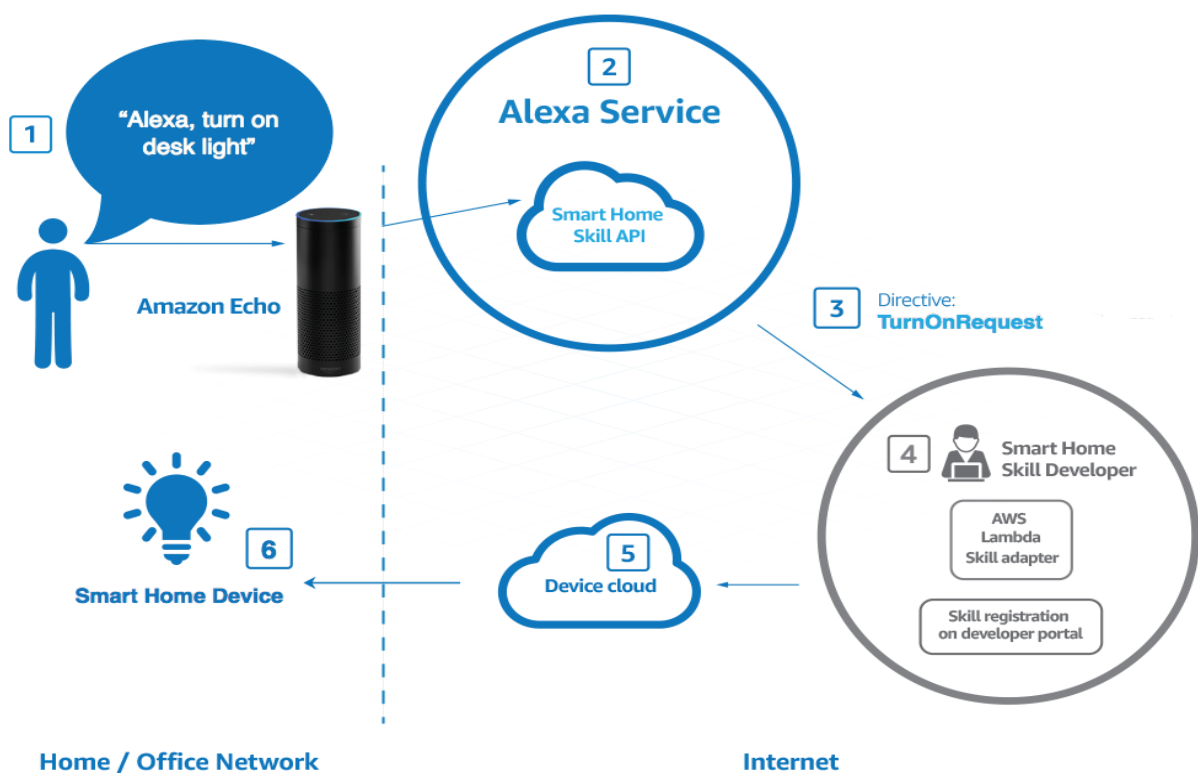
## AMAZON ALEXA

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- Amazon Echo might look like a cylindrical [Bluetooth speaker](#), and it is in part.
- The device has built-in omnidirectional speakers that play music and other audio.
- But it does so much more than that. Like smartphones with voice-recognition capabilities, Echo is yet another step toward the voice-controlled computers of science fiction we've been seeing in television and movies for decades.
- Alexa connects to the [Internet via your home Wi-Fi network](#). It's always on and listening for the magic word to wake it up.
- Once it hears that, the device gathers the voice commands that follow and sends them to a natural voice recognition service in the cloud called [Alexa Voice Service](#), which interprets them and sends back the appropriate response.
- The device has an array of microphones that can pick up your voice from across the room, even over music and other environmental noise.

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- You can ask the gadget to [play music](#), [tell you the weather forecast](#), [add to your to-do list](#), and [read you your schedule or the news](#), and much more. If you have compatible smart-home devices, you can tell Echo to dim the lights or turn appliances on or off.



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## APPLICATIONS OF SMART HOMES

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- **LIGHTING CONTROL :**

- Change the lighting in your home according to your mood with smart lighting control solution. This lighting control features allow you to operate every light and shade in your home, according to your convenience. Smart lighting control also offers dimmers, sensors, and timers that turn off lights automatically to maximize energy saving.

- **HOME AIR QUALITY & WATER QUALITY MONITORING :**

- Smart homes checks & monitors the home air quality & home water quality as well. It manages the room temperature according to the weather or it sets the cooling or heating according to your command. It also checks the water quality & it also reduce the wastage of water.

- **NATURAL LANGUAGE BASED VOICE ASSISTANTS :**

- There are several of voice assistants are available in the market now a days. The best assistant now a days is Amazon Alexa.
- Alexa controls your home with connecting through the network & it will performs the task according to your voice command.

- **SMART LOCKS :**

- Smart locks are provides more security in your home automation system.
- Smart locks are also connected with your mobiles & they also can be fingerprint scanners or voice matching devices to unlock the device.

- **SMART ENERGY METERS :**

- Smart home also manages your energy status for your home. If there is a wastage of the energy then it will turn off the energy source immediately.

- **For Example :**

- If you forgot to turn off your lights then it will automatically turns off the lights. So there can be energy wastage is reduced.

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## ADVANTAGES OF SMART HOME

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- **AUTOMATION & CONTROL :**

- Automation refers to the ability to program and schedule events for the devices on the network.
- The programming may include time-related commands, such as having your lights turn on or off at specific times each day.
- It can also include non-scheduled events, such as turning on all the lights in your home when your security system alarm is triggered.
- Once you start to understand the possibilities of home automation scheduling, you can come up with any number of useful and creative solutions to make your life better.

- **SECURITY :**

- One of the top-selling smart home devices in the security camera category is Amazon's Cloud Cam.
- The Cloud Cam promises users the ability to monitor the inside of their homes 24/7 and two-way audio.
- Amazon stores the footage from the Cloud Cam in its corporate servers, and videos travel through secure, encrypted connections. End users can watch videos on an app or access them through a password-protected web page.

- **BETTER QUALITY OF LIFE :**

- One of the most convenient things about many smart home technologies is that they let people do things in ultra-simple, quick ways.

- **For Example :**

- Instead of walking across a room to turn on a light, a person living in a highly automated home might say a phrase to illuminate an area of a house.

- **SAVES TIME :**

- **Securing your house** ever got into your car in the morning, only to wonder if you locked the front door? Or got a mile down the road and realized you left your garage open? Not a problem with smart homes. It lets you secure your home from anywhere with the touch of a button. If you forget, it'll send you a reminder.
- **Watching your energy bills** saving energy often comes at the expense of time. Smart plugs make it easy to switch appliances off automatically. You can have your lights turn off when you arm your security system. Your thermostat will set back to save energy when you leave the house. You'll barely notice – except when you see your energy bill.

- **SAVES MONEY :**

- **Electric Control with Home Automation**

Leave the room, turn it off! This is something you very well tell your children (and remind yourself!) all the time. Rummaging through remotes, climbing stairs or trekking across the house to your home theater to do so isn't top priority you're busy, we get it. What if I told you that with smart home technologies you'll never leave a light, TV or other appliance running longer than necessary again? Strategic placement of occupancy sensors and motion detectors does the work for you, so you can spend your time and energy doing something else.

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## LIMITATIONS OF SMART HOMES

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- **COSTLY :**

- Installing state-of-the-art features inside a home results in a higher price tag for the property. The cost of living expenses such as utilities, maintenance and repair of the technology can be expensive as well.

- **RELIABILITY :**

- A smart home will be extremely reliant on your internet connection. If your connection drops you'll be left with a lot of smart products that won't work. Additionally, wireless signals can possibly be interrupted by other electronics in your home and cause some of your smart products to function slowly or not at all.

- **INSTALLATION :**

- The setup of smart homes is difficult to install. Although the smart devices are very costly, the cost of maintaining the smart home installation charge is very high.

- **COMPLEX TECHNOLOGY :**

- Unlike traditional homes, smart home technology requires you to adapt to the innovations within your living area such as security systems, air units and a remote that controls your entire house.

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## FUTURE SCOPE

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- This application can be further developed into system with the following enhancements:
  - Bill functionality can be added to the home automation system which can predict bill of any selected period.
  - Gas leakage and light dimming functionality can also be added in near future.



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