BINDURA UNIVERSITY OF SCIENCE EDUCATION

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DEPARTMENT OF COMPUTER SCIENCE

Smart Farm House Security And Plant Management System

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ABSTRACT

A farm house is a place that must provide great comfort to the farmer. In order to achieve that the health of the farmer as well of his family is an important issue. The plants as well, whether they are flowers or crops have to be better managed. This project outlines the fundamental concept for implementing smart homes using Cisco packet tracers. When turning on and off electronic gadgets, one is required to establish a smart home. By simulating the testing system, network configuration, and wireless home gateway computer network equipment needed by a smart home network cisco packet tracer utilizing Internet of Things(IoT)/IoE command, smart house development is accomplished. The tool's primary program, Cisco Packet Tracer, was selected for the simulations. This research focused on the development of an IOT based SMART HOUSE SECURITY AND PLANT MANAGEMENT system, that enables the farmer to manage both his farm house as well plants in the comfort of using gadgets such as mobile phones and laptops

APPROVAL

This dissertation, entitled "SMART FARM HOUSE SECURITY AND PLANT MANAGEMENT SYSTEM" by TINOTENDA MANATSA takes into consideration and meets the regulations HBScIT at BINDURA UNIVERSITY OF SCIENCE EDUCATION, and is approved for its contribution to knowledge and literary presentation.

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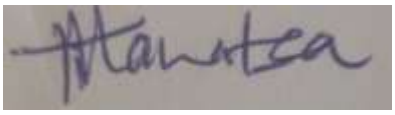

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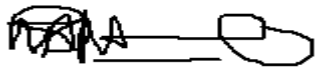

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Dedication

This research is dedicated to my family and friends who have stood by me and supported my vision of seeing this research succeed. I would like to thank you all for your support during my research. May God bless you all for what you have done for me, because it would not have been possible without your help.

Acknowledgements

I thank the Almighty God for giving me strength and helping me carry out this research project. My sincere gratitude goes to my family especially my mother for the love, unyielding support and prayers. My deepest gratitude goes to my supervisor Mr Matombo for his help, guidance and utmost patience towards making this research project a success. In addition, I would like to thank my colleagues, all lecturers at the Computer Science Department and the Bindura University of Science Education.

God Bless You.

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CHAPTER1: INTRODUCTION

INTRODUCTION

This chapter offers an overview of the research's history, defines the issue at hand, outlines its goals and objectives, and describes the tools and techniques for gathering data that will be employed throughout the investigation. This chapter also provides support for carrying out the research. This chapter also provides the reader with specific information about the critical role that a SMART FARMHOUSE SECURITY and PLANT MANAGEMENT SYSTEM plays in advancing environmentally friendly, sustainable IT. Occasionally, overwatering by the workers causes the plants to eventually die. The application of water artificially to soil or land helps with landscape upkeep, agricultural crop growth, and restoration.

Water runs through the lateral lines and eventually reaches the irrigation electrode (drip) or mechanical device heads when a zone is activated. A fitting and pipe can be linked to a number of sprinklers that have pipe thread inlets on the bottom of them. Typically, sprinklers are installed such that the top of the head is flush with the ground. Dripping became a popular technique because it minimizes significant water losses while saving labor costs and raising yields. All of the components will read and provide an output signal to the controller upon activation, after which the user (farmer) will see the presented information.

A smart home is a place where smart objects are used to enhance daily activities in advance. These objects can automate tasks that require user involvement, such as monitoring the temperature, humidity, smoke, wind, and sound levels in the home and then ventilating the space based on the information gathered from the sensors. Instead of just offering security, a smart home can offer additional functions including automated security through the use of different alarm systems, such as sirens, LCD displays, and email notifications to authorized users in the event that a security breach is discovered by sensors. Home automation is the process of managing and operating household items with the use of computers or microcontrollers. Automation is widely used because it offers convenience, effectiveness, and a safe environment. Every smart item in this project is registered with and controlled by a home gateway.

Definition of Internet of Things

It is a network that consists of different objects which have the capability to organize things automatically, it also has the ability to share information and give reactions and actions towards the environment.

The Internet of Things (IoT) is a network which allows objects and users to communicate with each other by giving a unique address to every object to identify which users are accessing what resource of the network easily. It also describes a world of network in which every object is connected to the network so that data can be shared. Everybody already has a smartphone, but a phone is not smart; rather, it helps its user to make smarter decisions.

Background of Research

By adding crucial data with the use of sensors, IoT technology offers a way to spread new discoveries about industry, agriculture, and energy distribution. Cisco claims that several businesses and research institutions are supplying information about how IoT will affect the internet and the economy over the course of the next five to 10 years. Morgan Stanley's analysis indicates that in 2019, there will be over 24 billion devices linked to the internet. Additionally, according to The Hawaii Company, 100 billion IoT connections will be made by 2025. According to McKinsey Global Institute, the global economic effects of the Internet of Things might reach between $3.9 and $11.1 trillion.

In 1999, innovator Kevin Ashton coined the term "Internet of Things" to describe the concept that physical objects on the planet may be linked to the internet using sensors. He explained how RFID (radio frequency identification), which is utilized in businesses, may be connected to the internet to track materials or commodities that are ready for sale without requiring human participation. The Internet of Things of today can define various items, gadgets, and internet-connected sensors.

Because of this, the concept of the Internet of Things is relatively new, but the idea of using computers and networks to manage and control objects has been around for a few decades. Smartphone-based remote control systems for electrical grids were first introduced to the market in the late 1970s. Wireless technology, which allowed businesses to communicate with one another and regulate operations and materials, was immensely popular in the 1990s.

PROBLEM DEFINITION

Many people in the current world place a high value on both their time and their businesses. They therefore use a lot of household equipment in their daily lives to do their tasks.

Therefore, a serious issue arises when one of the appliances fails to load the task. Home automation now offers a solution to practical issues. This will assist us in keeping an eye on things, managing them, gathering all the data needed to identify issues before they really occur with the gadget. Therefore, we can utilize a smart device to operate it remotely, giving us instant control over our home.

AIM

(Berddtsson et al., 2007), defined the aim as a short, clear, unambiguous statement that describes the overall goal of the research.

The aim of the research is to develop a SMART FARMHOUSE AND PLANT MANAGEMENT system that is capable of quickly detecting when to irrigate plants, automatic detection of gases in the farmhouse and filtering them out through auto opening and closing of windows as well as theft of farmhouse assets prevention.

OBJECTIVES

(Ahmed, 2016) stated that every research should have a set of clear, well-defined objectives that should be met for the project to be deemed a success, and if any of the objectives is not met, the research will be deemed a failure. The objectives of the research are :

1. To detect poisonous gases within the house and filter them out through the windows

2. To alert the farmer via alarm notifications on the current course of action in case of emergency within the house

3.To auto irrigate plants when water levels reach certain lines

4. To control home appliances anytime from anywhere in the world and efficiently utilize power by controlling appliances properly.

5. To have new technology to yield higher growth of the crops and their water supply.

RESEARCH QUESTIONS

A research question is a specific inquiry which the research seeks to provide a response to. It resides at the core of systematic investigation and it helps you to clearly define a path for the research process. The SMART FARMHOUSE SECURITY and PLANT MANAGEMENT SYSTEM is motivated by the following questions:

• How can good fresh air circulate in the farmhouse and its levels be monitored in and around?

• How can the farmer technicians be notified of changes in water levels on tanks in real time?

• How can farm equipment be protected from theft?

• How can automatically watering the plants when we are going on vacation? Or don't have to

bother my neighbors. Sometimes the neighbors do too much watering and the plants end up dying anyway.

METHODS AND INSTRUMENTS

Methods and instruments refer to the methodologies that were used during the research period to obtain knowledge about the research.

DATA COLLECTION TOOLS

Tools that I used during the period of this research were:

- The internet
- Academic papers
- Textbook
- Newspapers

INSTRUMENT USED IN SYSTEM CREATION

When creating the data center surveillance system, I used the following instruments:
- Cisco Packet Tracer as the name suggests, is a tool built by Cisco. This tool provides a network

simulation to practice simple and complex networks. As Cisco believes, the best way to learn about networking is to do it.

• C++ - It is a programming language that facilitates object-oriented programming that is used to write compiled applications which can be executed quickly by a computer system, and for that reason, it will be used to develop the data center surveillance system's code libraries.
• Home network gateway connects a residential building's local area network (LAN) to the Internet. It is set up depending on the configuration and needs of the household, so every home network gateway installation can be considered unique and one of a kind. Every home network configuration requires certain settings from its home network gateway. The more connections there are in a house, the more configuration time it needs to set up.

JUSTIFICATION / CONCLUSION

The problem highlighted above seemed addressable through the development of a SMART FARMHOUSE SECURITY and PLANT MANAGEMENT SYSTEM. The system would work like a domestic dog which watches over our homes, barks to alert us when there are intruders, and if we don't show any response, it bites the intruder to safeguard the premise. Applying the above example to a data center, when fully implemented, the SMART FARMHOUSE SECURITY and PLANT MANAGEMENT SYSTEM would monitor the farm on a 24/7 basis and alert the farmer about the abnormalities.

CHAPTER 2: LITERATURE REVIEW

INTRODUCTION

(Dawson, 2009) defined literature review as a written representation of the critical conceptual and evaluations of materials found relating to the research being undertaken. (Zobel, 2015) suggested that research literature helps understand the current debates, theories, and discoveries and can help

identify new lines of questioning or investigations and should provide alternative perspectives on the author's work. According to (Hart, 2018), the purpose of a literature review is to provide the researcher with a body of knowledge which he or she can relate to his or her own findings, and it also helps in the identification of what has been done and what is required to be done. In this chapter, I undertook an investigation to identify the prevailing works that have been made so as to aid farmers to detect hotspots in agriculture. These existing works were compared against the proposed SMART FARMHOUSE SECURITY and PLANT MANAGEMENT SYSTEM so as to evaluate its importance and the competitive advantages that farmers stand to benefit from using the system. Also, foresight prior to the development of the SMART FARMHOUSE SECURITY and PLANT MANAGEMENT SYSTEM was acquired from the researches carried out during this chapter. It also gave a picture of how the SMART FARMHOUSE SECURITY and PLANT MANAGEMENT SYSTEM is a stepping stone towards achieving Green IT.

CONCEPTUAL FRAMEWORK

Ahmed Abdi "Designing Smart Campus Using Internet of Things" International Journal of Computer Science Trends and Technology (IJCST) – Volume 6, Issue 3, May-June 2018
This essay aids in our exploration of the idea of the Internet of Things and its applicability on campuses. A new technology called the "Internet of Things" allows objects to be connected to one another via an internet connection. It allows devices to perceive and keep an eye on other gadgets from a distance. It has been demonstrated how to effectively construct a smart campus with advanced ICTs so that each activity and event within the campus can be screened and managed utilizing Internet of Things smart devices. A simulation tool is used to construct a smart office, a piece of the campus, to demonstrate the work's viability.

Nazmul Hossain, Md. Alam Hossain, Rafia Sultana & Farzana Akter Lima "A Security Framework for IoT based Smart Home Automation System" Global Journal of Computer Science and Technology – Volume 18, Issue 3, Version 1.0 Year 2018
A smart system was installed that uses computers or mobile devices to operate every appliance in the house. It also provides an overview of the best practices for controlling and preventing home

fire incidents in real time with prompt resolution. This also explains how the system improves home security and manages theft concerns. The suggested system checks sensor data, including that from motion, gas, light, and temperature sensors, and then activates a scheme based on the need.

Tanushree Sonkar, Ashok Verma "IoT Based Low Cost and Intelligent Module for Smart Irrigation System" INTERNATIONAL JOURNAL OF SCIENTIFIC PROGRESS AND RESEARCH (IJSPR) – Issue 168, Volume 68, Number 01, February 2020
The proposed system gives us an idea how to work for farming with various new technologies to yield higher growth of the crops and their water supply. It is also going to check the temperature, humidity, and soil moisture. The paper is all about automated control features with latest electronic technology using a microcontroller which turns the pumping motor ON and OFF on detecting the dampness content of the earth and GSM phone line. It works automatically and hence reduces the manpower.

Andrea Finardi "IoT Simulations with Cisco Packet Trace" Helsinki Metropolia University of Applied Sciences Master of Engineering Information Technology Master's Thesis 4th June 2018.
Jayashri and Arvind (2013) have implemented a fingerprint-based authentication system to unlock a door. This system helps users by only allowing the users whose fingerprints are authorized by the owner of the house.

In (2014), Govinda et al. explained and talked about the Design and Implementation of Security for Smart Home-based technology. It was concluded that there are two methods to installing home security using IoT. SMS-based system using GSM was proposed by Karri and Daniel (2005) to use internet services to send messages or alerts to the house owner instead of the conventional SMS.

Viraj Mali, Ankit Gorizia, Meghana Patil, Prof. P.S. Wawage in 2016 in International Journal of Research in Advent Technology (E-ISSN: 2321-9637) Special Issue, proposed "Home Automation and Security using Arduino Microcontroller"
In this system, the Arduino microcontroller is used to interface the Bluetooth and Wi-Fi shield of the Arduino. This makes it possible for the microcontroller to control using Wi-Fi to remotely

monitor the system and also to provide both technology as media for communication. A thorough introduction of home security system was published by DEVCON Home Security. The system is equipped with sensors and motion detectors. When an uninvited visitor arrives at home and tampers with door knobs, windows, or garage doors, the sensors will trigger an alarm. Some systems include an outdoor and indoor siren that will alert the homeowner and neighbors of an intruder.

PROPOSED SYSTEM

The system will provide flexible management of the farmhouse by making sure that the security aspect is controlled using network devices such as laptops and mobile phone. The system will also control the air circulating in the house, thereby removing poisonous gases via opening and closing of windows.

This method automatically irrigates all the lands that must be manually irrigated. With this system, farmers won't have to spend as much time watching the field for indications of dryness as they would have with the previous one, which required frequent and continuous field monitoring. It significantly reduces the demand for labor by a significant amount. This system will be able to continue operating even in the event of a brief absence from the owner, guaranteeing adequate

irrigation even when no one is around. Moreover, no water would be lost when traversing.

Agriculture

CONCLUSION

Using past scholars enables us to know that we are heading towards the appropriate direction. These scholars have done their research based on what they had noticed in that particular time. In essence, as this system is built, it is safer to always look back on the job and take bits and bits of information in terms of creating a near perfect mechanism.

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CHAPTER3:PROJECT DESIGN AND METHODOLOGY

Methodology is a specific procedure that is used to identify, select, process and analyze the information about a study topic, giving the overall validity of the study (Bryman et al., 2011). The research study shall use the qualitative methodology. Qualitative research methodology relies on the views of participants; asks broad questions; collects data consisting largely of words (text) from participants; describes and analyzes these words for themes; and conducts the inquiry in a subjective manner (Creswell, 2008).

Quantitative research methodology is a systematic process of collecting and analyzing numerical data to describe, explain, or predict phenomena. It is often used in the social sciences, natural sciences, and engineering to test hypotheses, establish causal relationships, and make generalizations about populations.

Key features of quantitative research methodology:

- **Structured data collection**: Quantitative data is typically collected using structured instruments, such as surveys, questionnaires, or experiments. This ensures that the data is consistent and reliable.
- **Numerical analysis**: Quantitative data is analyzed using statistical methods to identify patterns, trends, and relationships.
- **Generalizability**: Quantitative research aims to generalize findings to a larger population. This requires a representative sample and careful design of the research study.

Types of quantitative research methods:

- **Surveys**: Surveys are used to collect data from a sample of people. They can be administered online, in person, or by phone.
- **Questionnaires**: Questionnaires are self-administered surveys that are typically shorter than surveys.
- **Experiments**: Experiments are used to test causal relationships between variables. They involve manipulating one variable and measuring the effect on another variable.

Advantages of quantitative research methodology:

- **Objectivity**: Quantitative research is objective because it relies on numerical data and statistical analysis. This helps to reduce bias and subjectivity.
- **Reliability**: Quantitative research is reliable because it is based on structured data collection and analysis methods. This makes it more likely to produce consistent and replicable results.
- **Generalizability**: Quantitative research aims to generalize findings to a larger population. This makes it possible to make broad statements about the population of interest.

Disadvantages of quantitative research methodology:

- **Limited scope**: Quantitative research is limited to what can be measured and quantified. It may not be able to capture the full complexity of human experiences and behaviors.
- **Lack of context**: Quantitative research may not provide a lot of context for the findings. It is important to consider the social, cultural, and historical context when interpreting the results.
- **Ethical considerations**: Quantitative research may raise ethical concerns, such as privacy and confidentiality. It is important to obtain informed consent from participants and protect their privacy.

SELECTING EXPERIMENTS

Experiment is a research methodology. It is a systematic process of observing and manipulating variables to test a hypothesis. Experiments are often used in quantitative research to establish causal relationships between variables.

Key features of experimental research methodology:

- **Manipulation of variables**: Experiments involve deliberately changing one variable (the independent variable) to see how it affects another variable (the dependent variable).

- **Controlled setting**: Experiments are conducted in a controlled setting where other factors that could influence the dependent variable are held constant or minimized.
- **Randomization**: Experiments often use randomization to assign participants to different groups or conditions. This helps to eliminate bias and ensure that the results are more reliable.
- **Data collection**: Experiments collect quantitative data, such as numerical measurements or observations. This data is then analyzed using statistical methods to identify patterns and relationships.

Types of experiments:

- **True experiments**: True experiments involve random assignment of participants to different groups or conditions. This is the strongest type of experiment because it allows for the most rigorous control of confounding variables.
- **Quasi-experiments**: Quasi-experiments do not involve random assignment of participants. This makes them less rigorous than true experiments, but they can still provide valuable insights into causal relationships.

Examples of experiments:

- A study of the effect of a new drug on blood pressure.
- A study of the impact of different teaching methods on student learning.
- A study of the relationship between sleep deprivation and performance on a cognitive task.

Advantages of experimental research methodology:

- **High internal validity**: Experiments can provide strong evidence of causality because they allow for the manipulation of variables and control of confounding factors.
- **High reliability**: Experiments can produce consistent results when conducted carefully.
- **High generalizability**: Experiments can be generalized to larger populations if the sample is representative.

Disadvantages of experimental research methodology:

- **Ethical considerations**: Experiments may raise ethical concerns, such as the potential for harm to participants. It is important to conduct experiments ethically and with informed consent.
- **Limited scope**: Experiments are limited to what can be manipulated and controlled in a laboratory setting. They may not be able to capture the full complexity of human behavior or phenomena.
- **Resource intensive**: Experiments can be time-consuming and expensive to conduct. They may require specialized equipment and expertise.

DESIGNAND IMPLEMENTATION

BLOCK DIAGRAM

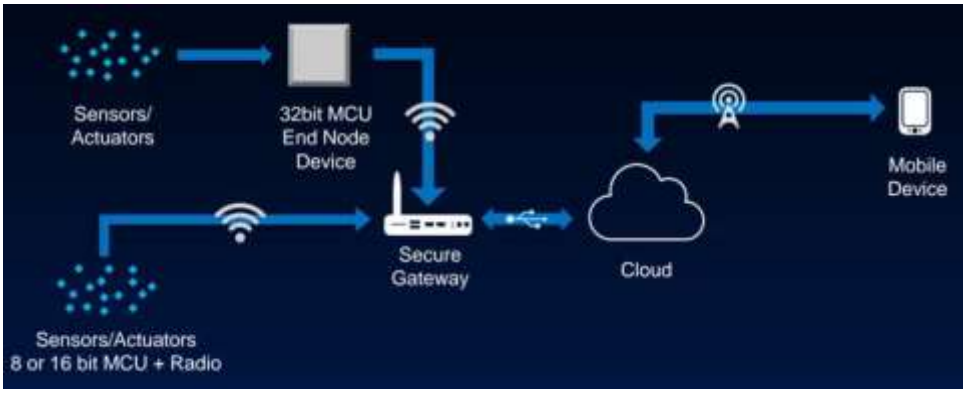


Fig3.1Block Diagram of Smart Home Automation

Figure 3.1: Smart Home Automation Block Diagram

The automation block diagram for a smart home looks like this. Actuators and sensors are present. Heat, light, sound, and other senses are employed by sensors to detect activity. Actuators are devices that employ sensor signals to translate them into mechanical motion.

A secure home gateway, which connects linked LAN hosts to a wide area network (WAN), is home to a number of smart devices that are wirelessly connected to it. As you are aware, networking is essential if you want to work remotely on anything. After connecting all devices to the home gateway, it will transfer all the information collected by the smart devices to the cloud.

A cloud is the internet-based provision of storage. In simple words, it’s a branch of servers used to store the information, and it also has networking power to route the network. The main reason to connect the home gateway to the cloud is that, using this technology, we can access our smart home from anywhere in the world using a smartphone.

Smart home automation faces different types of topology day by day. So, by connecting all devices to the gateway, the devices will communicate with each other and detect problems before the shutdown of those devices in the future. It can also send an alert to the user's phone to fix the issue.

Algorithm

Steps for implementing smart home areas are as follows:

- **Step 1**: Start the project.
- **Step 2**: Open the .pk extension file and save the file.
- **Step 3**: Add the required components to the workspace.
- **Step 4**: Connect all devices in the workspace using cables.
- **Step 5**: Configure the device and set up the internet service provider router.
- **Step 6**: Add Home gateway to the network.
- **Step 7**: Connect smart devices to the home gateway.
- **Step 8**: Add end user device to the network.
- **Step 9**: Automate the activities in the smart home.
- **Step 10**: Test your simulation.
- **Step 11**: Stop.

Homegateway

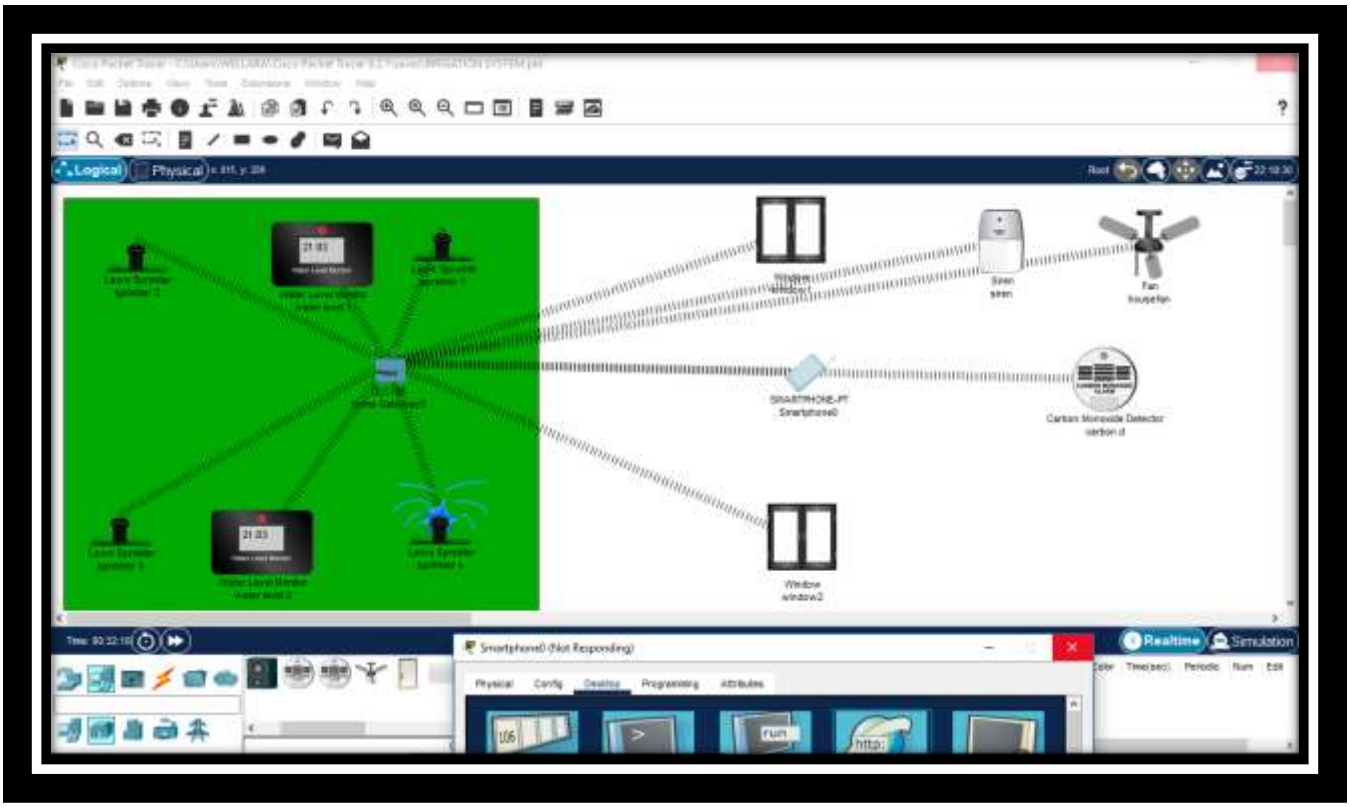


Fig2 **Home gateway with associated smart objects**

The IoT smart devices can directly register with the home gateway IoT service or network database. It offers a wireless service on channel 6 that is provided with the SSID (service set identifier) and 4 Ethernet ports. We can also set up WEP/WPA-PSK/WPA2 passphrase to wireless links for safer connections.

The diagram indicates that the smart objects are associated to the home gateway by wireless medium for local and remote control of smart devices. The home gateway is connected through WAN Ethernet port to the internet. We can easily manage the IoT system with the help of the home gateway and web interface. The internal IP address for the home gateway is 192.168.25.10, and can also be reached via its IP address in front of the Internet. The home portal can also be used as a DHCP server that assigns IP addresses to any connected smart device.

SMARTPHONE

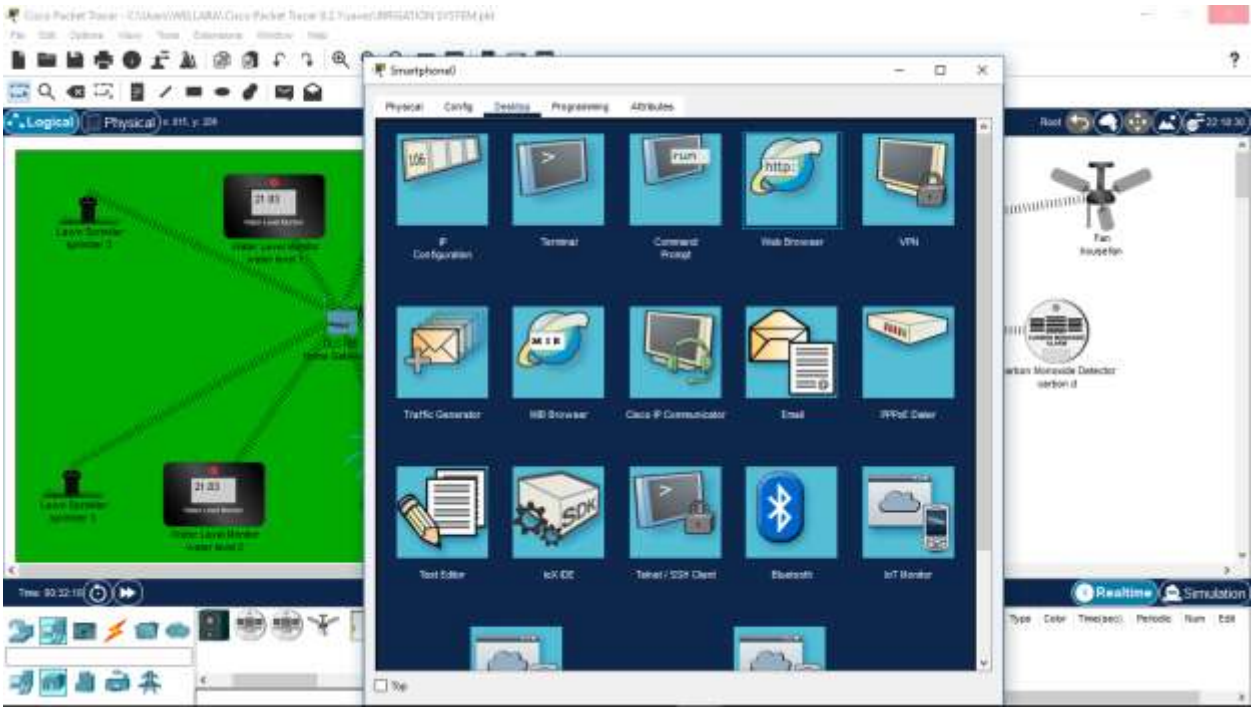


Fig3

SMARTIOTDEVICESREGISTRATION

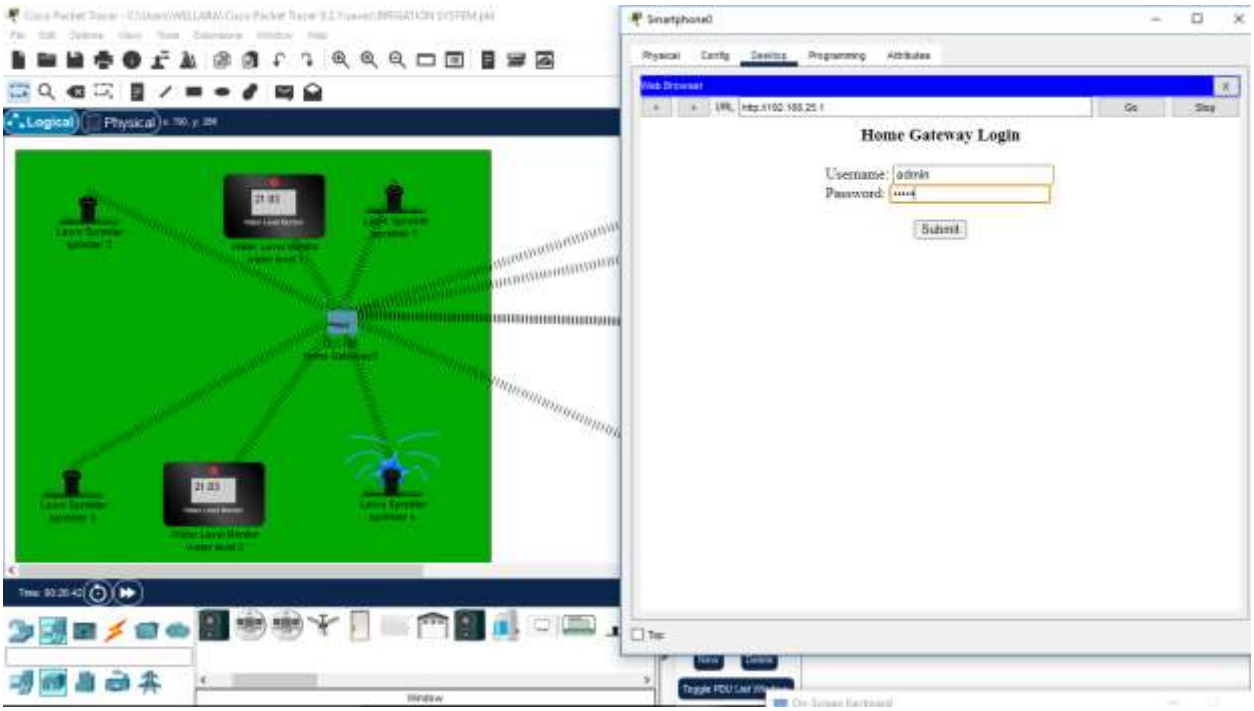
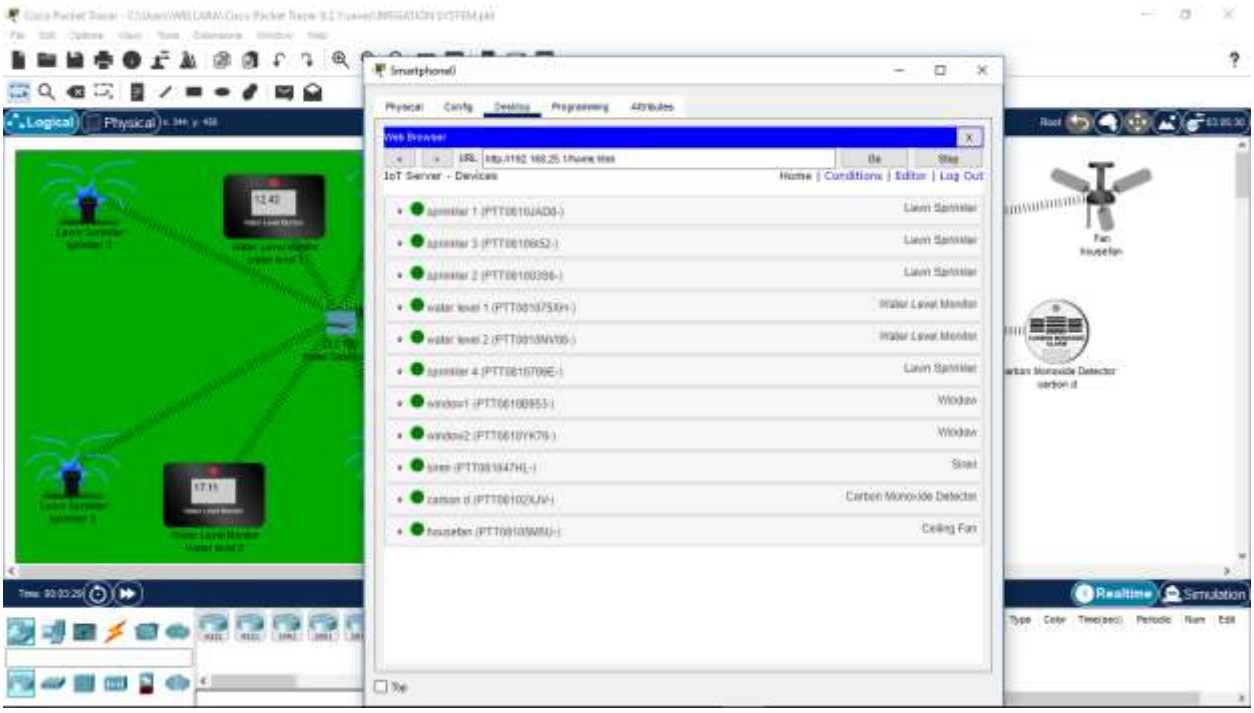


Fig4

LIST OF IOT REGISTERED DEVICES



SYSTEM REQUIREMENTS

Cisco Packet Tracer is a Cisco proprietary multiplatform tool that enables the possibility to create networks and IoT simulation without the need of a hardware or pre-existing network. The tool is free of charge, runs on the major operating systems, and it is downloadable from Cisco NetAcad page for all the users who are having a valid NetAcad account. The tool was built in order to allow users to experiment with networking without having a need for costly network infrastructure and lengthy hardware setup procedures. Some of the components used in the project are as follows.

HomeGateway:-

Homegateway

A home/residential gateway is a gateway that allows the connection of a local area network (LAN) to a wide area network (WAN). So, a home gateway actually helps to connect a smaller network to a larger network or directly helps in connecting to the internet. For example, if you have a Wi-Fi router in your home and all the home devices are connected to it, but the devices require to access the internet, then there is a requirement of home gateway which enables them to connect to the larger network that is the internet. So, the gateway facility is provided by the router.

Smart Devices:

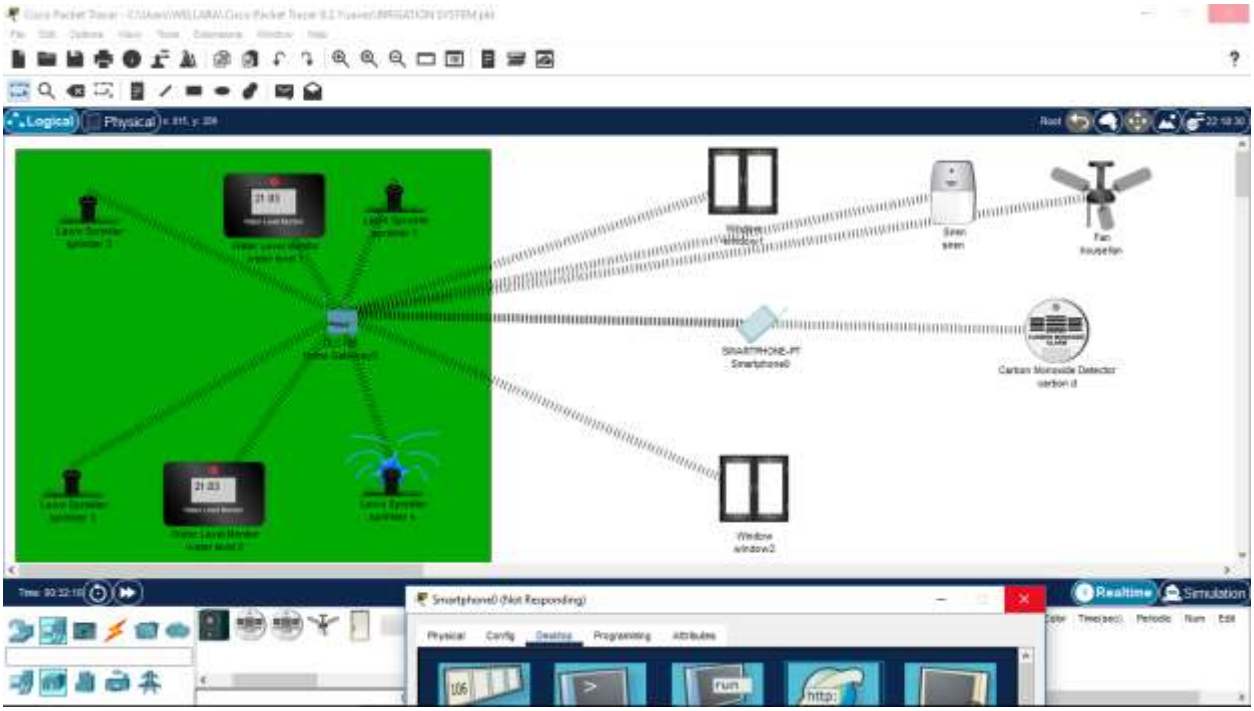
Smart Device

A smart device, as the name suggests, is an electronic gadget that is able to connect, share, and interact with its user and other smart devices. Although usually small in size, smart devices typically have the computing power of a few gigabytes. Smart devices are interactive electronic gadgets that understand simple commands sent by users and help in daily activities. Some of the most commonly used smart devices are smartphones, tablets, smartwatches, smart glasses, and other personal electronics. While many smart devices are small, portable personal electronics, they

are in fact defined by their ability to connect to a network to share and interact remotely. Many TV sets and refrigerators are also therefore considered smart devices.

Implementation

For implementing smart home, I used different sensors, smart devices, and detectors to make smarter. The following figure represents the home architecture that connected each other using wireless and wired medium.



Smart home architecture and plant management architecture.

Device configuration

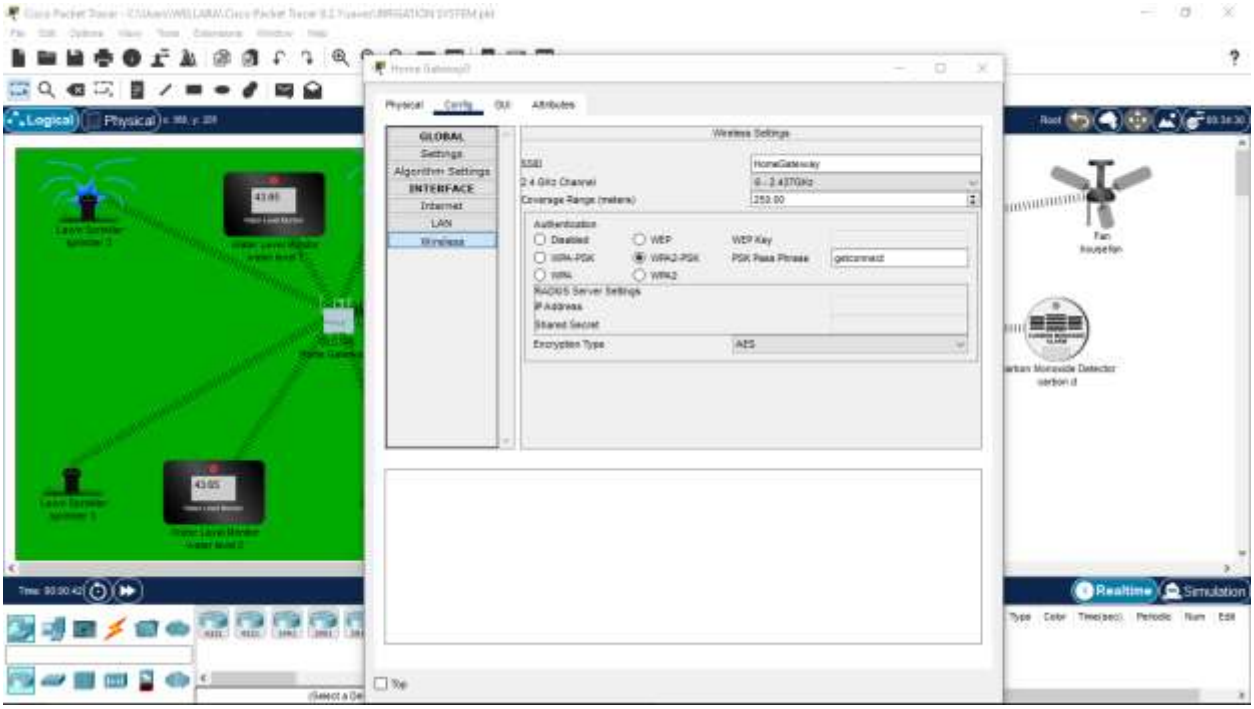


Fig6

After configuring the home gateway, input WAN network in each IoT device in the form below.

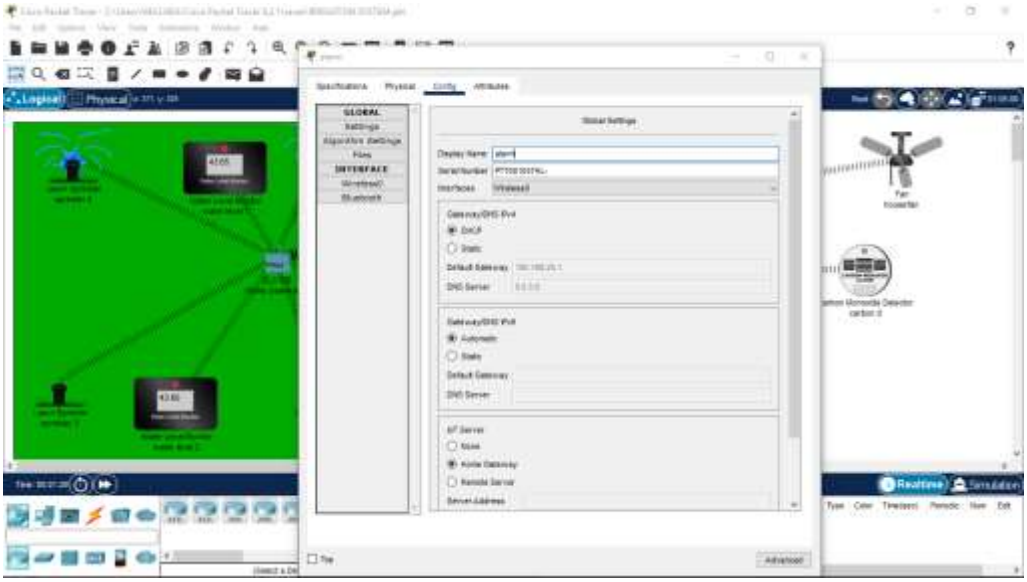


Fig7

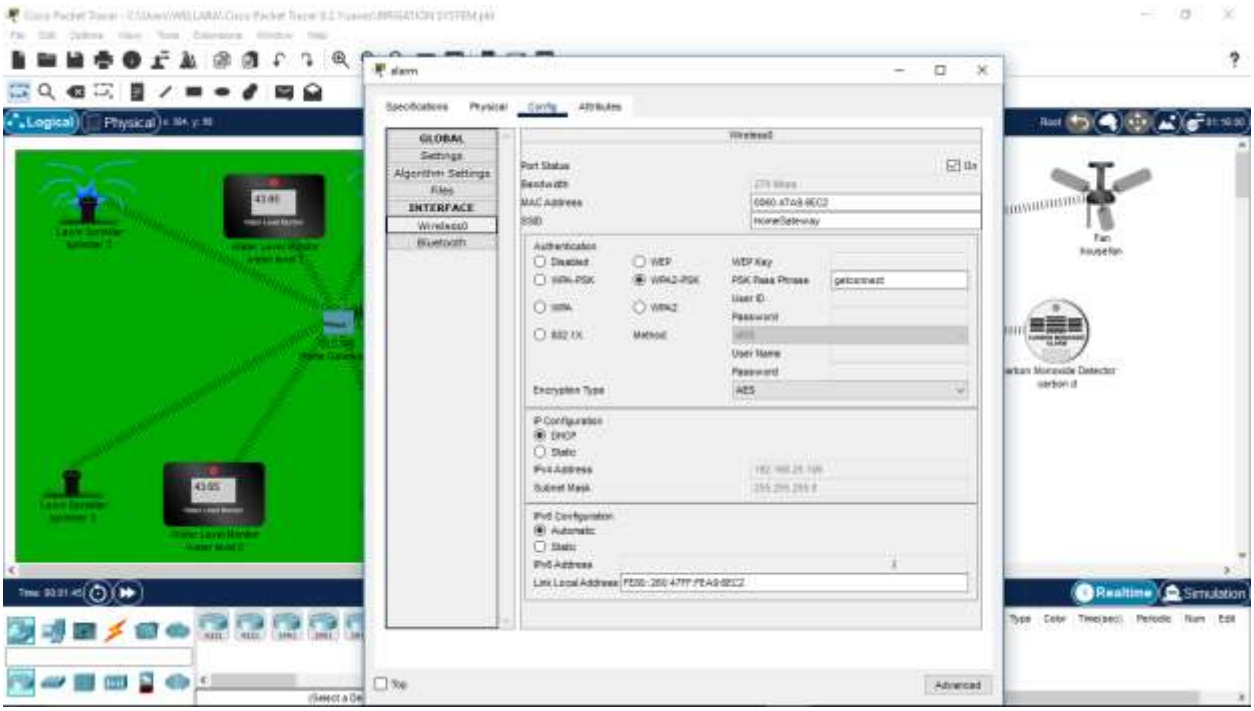


Fig8

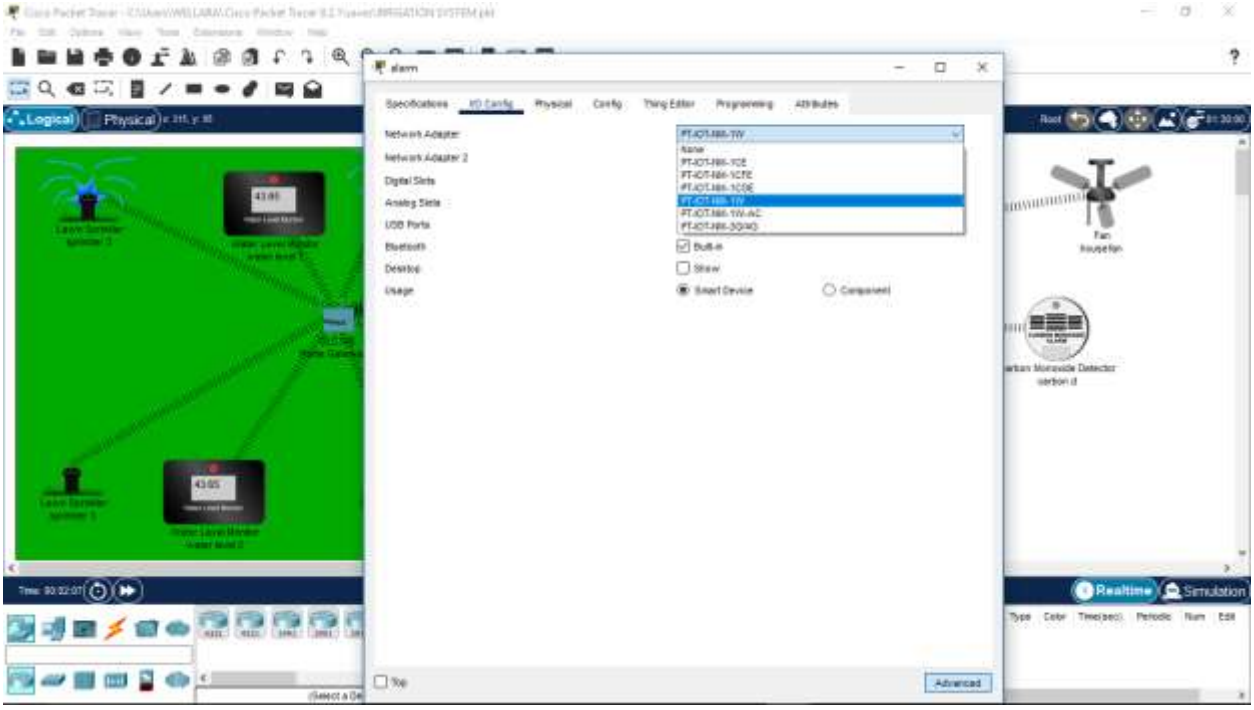


Fig 9

THE IOT COMPONENTS USED

IRRIGATION SPRINKLERS AND WATER LEVEL MONITORS.

Sprinkler Irrigation

Sprinkler irrigation is a method of applying water to crops in a controlled manner, similar to rainfall. This is done by using a system of pipes and nozzles to distribute water over the fields. Sprinkler irrigation is commonly used in agriculture to provide the necessary amount of water to crops, and it can be more efficient than other methods such as flood irrigation.

Water Level Monitors

Water level monitors are devices used to measure the depth or height of water in a specific area, such as a tank, reservoir, or river. These monitors can use various technologies including ultrasonic, pressure sensors, or float switches to accurately measure the water level.

Carbon dioxide sensor

A carbon monoxide detector is a device that detects the presence of carbon monoxide gas in the air. Carbon monoxide is a colorless, odorless gas that can be deadly if inhaled in high concentrations. Carbon monoxide detectors are designed to alert people when the gas reaches dangerous levels.

HOUSE FAN

A ceiling fan is a mechanical fan that is suspended from the ceiling of a room and uses rotating blades to circulate air. It is typically used to cool a room by creating a wind chill effect, but can also be used to help distribute heat in the winter.

Ceiling fans come in a variety of styles and sizes, and can be controlled by a wall switch, pull chain, or remote control. They are often used in conjunction with air conditioning or heating systems to help reduce energy costs.

SIREN

Sirens exist in home security systems both on their own and as part of other devices, such as the base station (which we'll get to below). Sirens often go off at the same time as other alarms and are intended to scare intruders away or alert our neighbors.

WINDOW

It is a panel which allows free air movement into and out of the house.

Connect all IoT devices

Steps for connecting IoT devices with home gateway wirelessly:

Step 1: Click on the IoT device.

Step 2: Go to advanced setting.

Step 3: Go to the I/O config.

Step 4: Select PT-IOT-NM-1W (for wireless connection).

Step 5: Go to config.

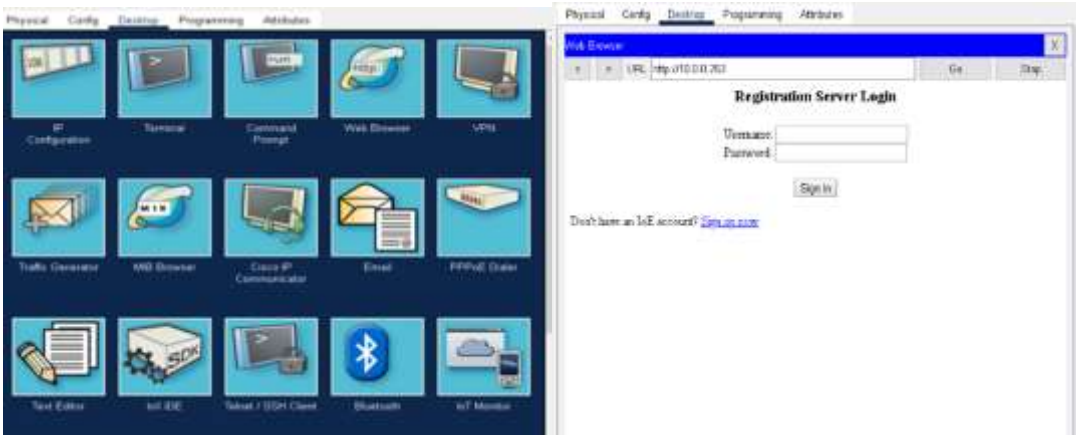
Step 6: Select wireless (in wireless connection).

Step 7: Enter passkey of the get connect network.

Monitoring and controlling IoT devices through remote devices

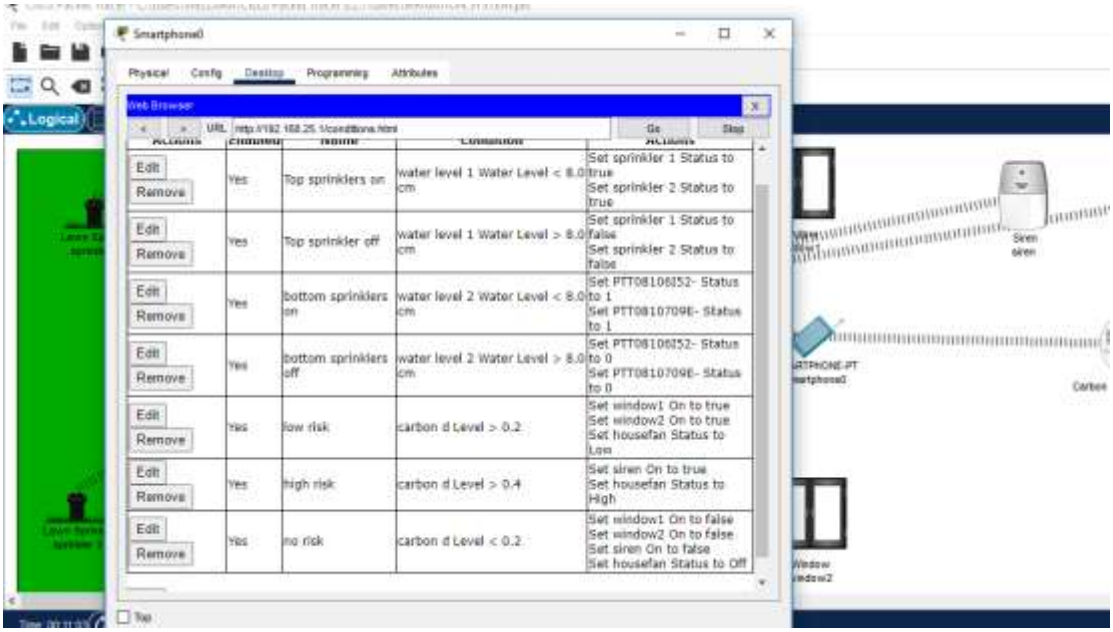
Steps for controlling and monitoring IoT devices:

Step 1: Click on the remote device like smartphone, laptop, tablet or PC.
Step 2: Select IoT monitor application from the device desktop.
Step 3: Register if new user and enter IP address and login credentials.
Step 4: Control and monitor your IoT devices.



-Applications on smartphone IOT server log in through web browser

-monitoringandcontrollingIOTdevices



Conditions for automation

List of components used for implementation

SLNO	Device	Function
1.	End devices	Connect to home gateway to access smart objects
2.	Home gateway	Used for registering and providing ip address for iot devices
3.	Fan	Used for ventilation
4.	Co2detector	Detects level of co2 in the kitchen
5.	Water level monitor	Used for detection of water level
6.	Lawn sprinkler	Used to sprinkle water
7.	Smart window	Controlling the window remotely
8	siren	Alarms the house

CHAPTER4: SIMULATION AND IMPLEMENTATION

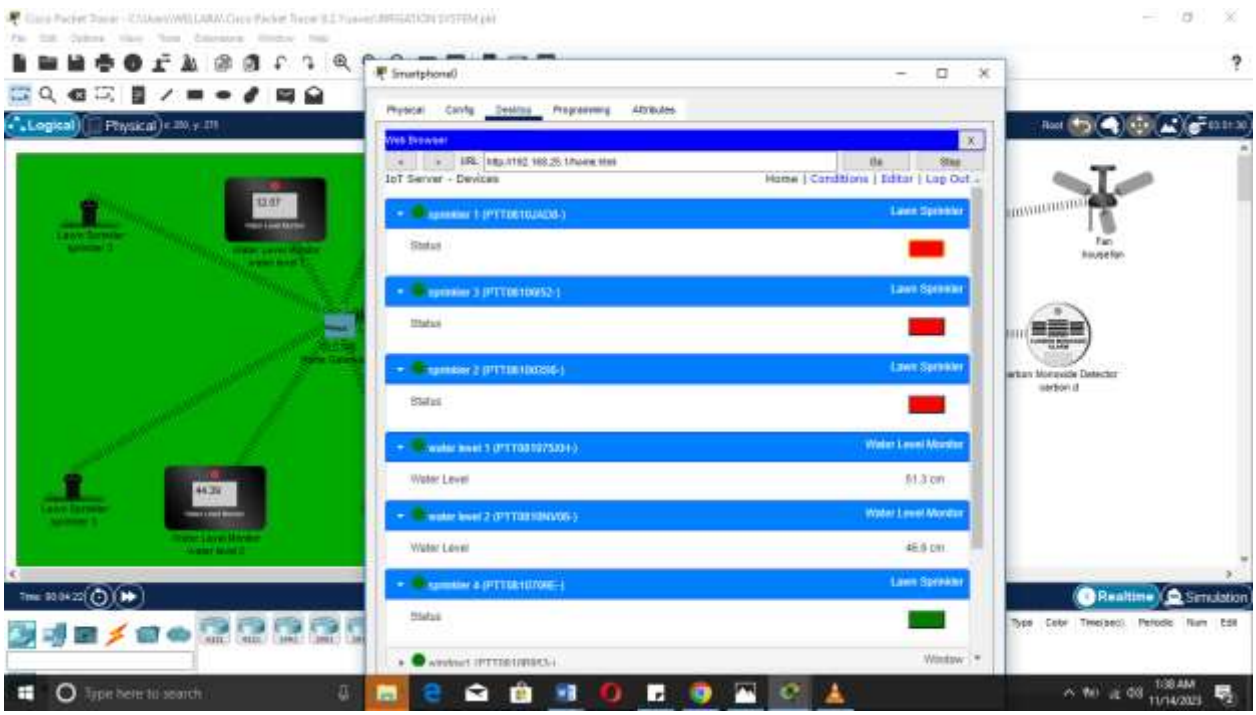
INTRODUCTION

The preceding chapters focused on widely reviewing the smart farmhouse security and plant management system structure as well as revealing the functions and principles of operation of the various components which make up its build. In this chapter, I will focus on bringing the system to life, running simulations to verify its functionality against its objectives as well as its implementation.

INTERFACING COMPONENTS

This refers to the process of physically connecting the various shields that make up the system as well as executing the simulation.

results



-Monitoring and controlling smartdevices

KEY RESULTS

Lawn sprinklers automation

Here is the text with spaces between the words:

The lawn sprinkler is set to one based on the condition made on Home gateway, that is, if water level is more than 5 cm, the lawn sprinkler is on, else off. If the humidity is less than 80%, then set lawn sprinkler in on state.

Detection of Smoke by CO2 Detector

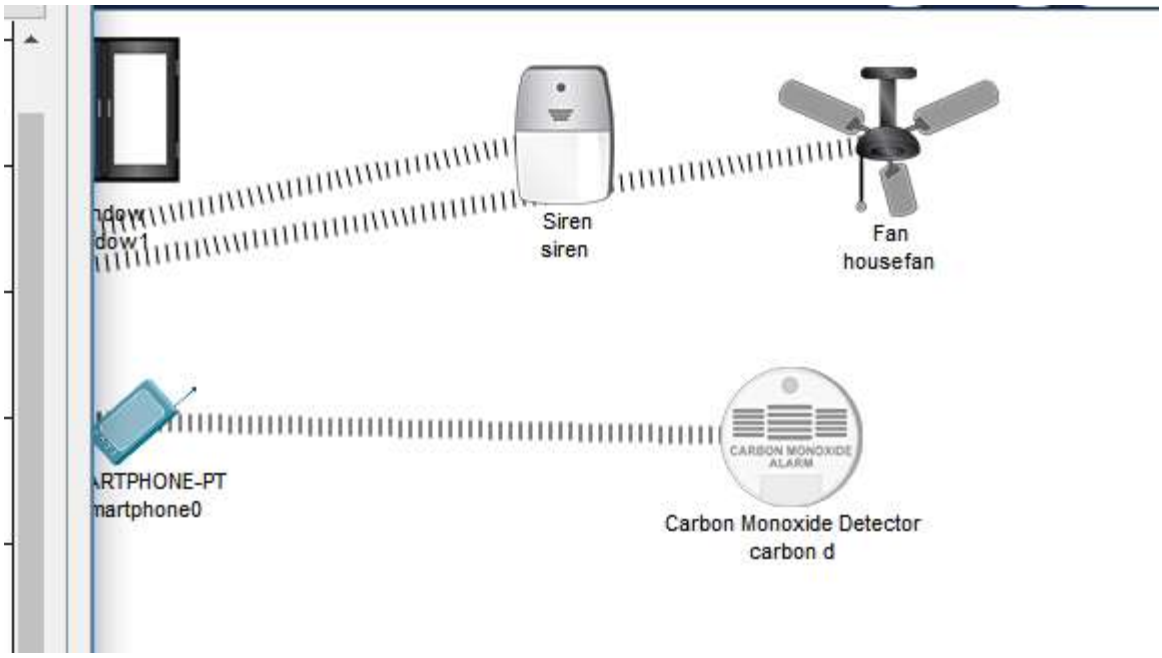


Fig4.6:-Detection of smoke by CO2 Detector

In this working model, this is the main part: whenever there is fire in the house, the carbon monoxide detector will detect the smoke, and when it crosses above a certain level, it will start by opening the window, and the fan will automatically start fanning away the gas. So when smoke crosses below that level, then this will automatically switch off.

ADVANTAGES

1. Controlling every gadget in your house from one location. Here, convenience plays a major role. A significant advancement in home management and technology is being able to maintain connectivity across all of the devices in your house via a single interface. In theory, you could access a plethora of features and gadgets in your house by simply learning how to use a single app on your tablet and smartphone. This significantly reduces the learning curve for inexperienced users and facilitates access to the features you really want for your house.
2. Flexibility for new devices and appliances. Smart home systems tend to be wonderfully flexible when it comes to the accommodation of new devices and appliances and other technology. No matter how state-of-the-art your appliances seem today, there will be newer, more impressive models developed as time goes on. Beyond that, you'll probably

add to your suite of devices as you replace the older ones or discover new technology to accompany your indoor and outdoor spaces. Being able to integrate these newcomers seamlessly will make your job as a homeowner much easier and allow you to keep upgrading to the latest lifestyle technology.

3. Home function control from a distance. Never undervalue the significance of having remote access to your home's operations. If it's a very hot day, you can set your thermostat to cool down in time for you to arrive home from work. You can set your oven to preheat while you're still in the supermarket if you need to start dinner quickly but are running late. You may even make sure you turned off all of your media while you were away, see whether you left the lights on, or see who is at your front door.
4. The sheer amount of consumer interest generated by smart home technology means the world's biggest tech companies and innovators have entered a race to outdo one another. That means bigger, better smart home tech is constantly being developed to match our digital needs, and the industry is on a tremendous upward trajectory.

APPLICATIONS

• Home automation technology is growing drastically, and its demand is increasing in a wider range of sectors, which results in: - Increase in enhanced performance, it enhances human comfort, it improves energy efficiency of the room.

• It is used to assist in growing of agricultural crops, maintenance of landscapes, and revegetation of disturbed soils in dry areas and during periods of inadequate rainfall.

• By using Cisco packet tracers in home automation and crop monitoring, it benefits in a realistic simulation and visualization of IoT devices.

• Cisco packet tracers provides two operating modes to visualize the behavior of a network, i.e., real-time mode and simulation mode.

• The real-time mode gives a variable alternative to real equipment and allows them to gain configuration practice before working with real equipment.

• In simulation mode, the user sees and controls time intervals working of data transfer and propagation of data across a network.

• Permits users to design, build, configure smart home, smart city by providing smart objects use for them. Provide board to control smart object. Provide detector for sensor for crop monitoring.

CHAPTER5: CONCUSION AND RECOMMENDATIONS

INTRODUCTION

In the previous chapters, I introduced the smart farmhouse security and plant management system, exposing how it works and running tests and simulations as well as testing the system against its objectives. In this chapter I will focus on conducting a discussion on the system, stating its limitations, giving recommendations as well as the future scope of the system. This chapter also serves to conclude the research.

Disadvantages of Farm Home Automation:

Cost: One of the main drawbacks of home automation is the cost. Smart devices and systems can be expensive, and the cost can add up quickly if you want to fully automate your home.

Reliance on Technology: Home automation also means that you are relying on technology to control various aspects of your home. If there is a power outage or internet connectivity issues, you may not be able to control your smart devices until the issue is resolved.

Privacy Concerns: With so many connected devices in your home, there is also the potential for privacy concerns. Hackers could potentially gain access to your smart devices and collect sensitive information or even control them remotely.

Learning Curve: Finally, home automation can also have a learning curve. Setting up and configuring your smart devices and systems can be complex, and it may take some time to learn how to use them effectively.

CONCLUSION

This project's primary goal was to develop and install an Internet of Things-based agricultural monitoring and home automation system. The work is motivated by the rise in smart device usage and innovative technologies. Our surroundings are made smarter by IoT technology, and the security measures are quite informative. Cisco packet tracer is used in this research and offers a

number of options for simplifying simulation. The NetAcad workshops and earlier research analyses are highly helpful in the smart home implementation phase.

The project's results indicate that users' end devices can be used to monitor and operate Internet of Things devices, and there is potential to implement the smart home model in real life. A microcontroller that can be utilized to facilitate device communication is also included in the Cisco packet tracer. Programming a microcontroller can be done using Python or JavaScript; if this is done, the IoT system will function more quickly and dependably.

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