MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

A PROJECT REPORT ON

“Internet of Things“

Submitted By

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Under the Guidance of

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Dept. of Computer Science & Engineering
In partial fulfillment for the award of

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Department Of Computer Science & Engineering
Masyodari Shikshan Sanstha’s

COLLEGE OF ENGINEERING AND TECHNOLOGY[POLYTECHNIC WING]
Jalna

CERTIFICATE

This is to certify that Purushottam Tapase, Mayur Garkhede, Purushottam Choudhari of Sixth Semester of **Diploma in Computer Science & Engineering** of Institute, **Matsyodari Shikshan Sanstha's Collage of Engineering & Technology** has completed the Micro Project satisfactorily in subject "Emerging Trends in Computer and Information Technology (ETI) " **(22618)** for the academic year **2023- 2024** as prescribed in the curriculum.

Date: …… Place: Jalna.

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Dr. S. K. Biradar
Principal
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APPROVAL SHEET

This Project report entitled **"Internet of Things"** submitted by Purushottam Tapase, Mayur Garkhede, Purushottam Choudhari is approved for the Diploma in Computer Science and Engineering of Maharashtra State Board of Technical Education, Mumbai.

Examiner

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Guide

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Date: _____

Place: _____

DECLARATION

We hereby declare that we have form completed & return that dissertation entitled **"Internet of Things "** it has not been submitted for the basis of the award of any diploma or other similar title of this any other diploma examination body/university.

Place: MSS's CET, Jalna

Date:_____

INDEX

AIM:

The project entitled **"Internet of Things"** is aimed at providing basic knowledge of Internet of Things and its types. Even if he/she doesn't have any knowledge of Internet of Things.

COURSE OUTCOME :

1] Describe Artificial Intelligence, Machine Learning

and deep learning

2]Interpret IoT concept

PROCEDURE FOLLOWED :

IoT systems allow users to achieve deeper automation, analysis, and integration within a system. They improve the reach of these areas and their accuracy. IoT utilizes existing and emerging technology for sensing, networking, and robotics.

IoT exploits recent advances in software, falling hardware prices, and modern attitudes towards technology. Its new and advanced elements bring major changes in the delivery of products, goods, and services; and the social, economic, and political impact of those changes.

- **IoT – Key Features**

The most important features of IoT include artificial intelligence, connectivity, sensors, active engagement, and small device use. A brief review of these features is given below −

- **AI** − IoT essentially makes virtually anything "smart", meaning it enhances every aspect of life with the power of data collection, artificial intelligence algorithms, and networks. This can mean something as simple as enhancing your refrigerator and cabinets to

detect when milk and your favorite cereal run low, and to then place an order with your preferred grocer.

- **Connectivity** − New enabling technologies for networking, and specifically IoT networking, mean networks are no longer exclusively tied to major providers. Networks can exist on a much smaller and cheaper scale while still being practical. IoT creates these small networks between its system devices.
- **Sensors** − IoT loses its distinction without sensors. They act as defining instruments which transform IoT from a standard passive network of devices into an active system capable of real-world integration.
- **Active Engagement** − Much of today's interaction with connected technology happens through passive engagement. IoT introduces a new paradigm for active content, product, or service engagement.
- **Small Devices** − Devices, as predicted, have become smaller, cheaper, and more powerful over time. IoT exploits purpose-built small devices to deliver its precision, scalability, and versatility.

❖ **IoT − Sensors**

The most important hardware in IoT might be its sensors. These

devices consist of energy modules, power management modules, RF

modules, and sensing modules. RF modules manage communications

through their signal processing, WiFi, ZigBee, Bluetooth, radio

transceiver, duplexer, and BAW

❖ **Wearable Electronics**

Wearable electronic devices are small devices worn on the head, neck, arms, torso, and feet.

Smartwatches not only help us stay connected, but as a part of an IoT system, they allow access needed for improved productivity

Current smart wearable devices include −

- **Head** − Helmets, glasses
- **Neck** − Jewelry, collars
- **Arm** − Watches, wristbands, rings
- **Torso** − Clothing, backpacks
- **Feet** − Socks, shoes

❖ **Standard Devices**

The desktop, tablet, and cellphone remain integral parts of IoT as the command center and remotes.

- The **desktop** provides the user with the highest level of control over the system and its settings.
- The **tablet** provides access to the key features of the system in a way resembling the desktop, and also acts as a remote.
- The **cellphone** allows some essential settings modification and also provides remote functionality.

Other key connected devices include standard network devices like **routers** and **switches**.

❖ IoT – Advantages

The advantages of IoT span across every area of lifestyle and business. Here is a list of some of the advantages that IoT has to offer –

- **Improved Customer Engagement** – Current analytics suffer from blind-spots and significant flaws in accuracy; and as noted, engagement remains passive. IoT completely transforms this to achieve richer and more effective engagement with audiences.
- **Technology Optimization** – The same technologies and data which improve the customer experience also improve device use, and aid in more potent improvements to technology. IoT unlocks a world of critical functional and field data.
- **Reduced Waste** – IoT makes areas of improvement clear. Current analytics give us superficial insight, but IoT provides real-world information leading to more effective management of resources.
- **Enhanced Data Collection** – Modern data collection suffers from its limitations and its design for passive use. IoT breaks it out of those spaces, and places it exactly where humans really want to go to analyze our world. It allows an accurate picture of everything.

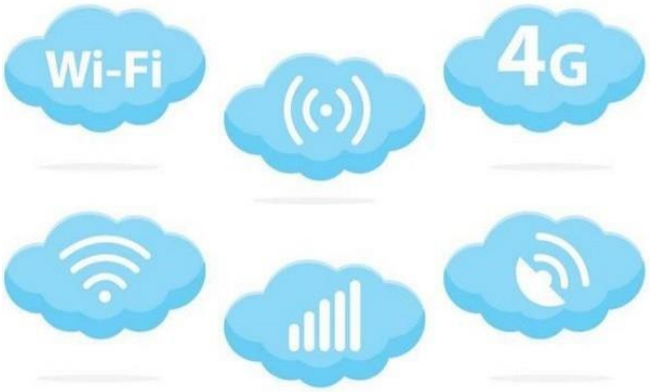
❖ IoT – Disadvantages

Though IoT delivers an impressive set of benefits, it also presents a significant set of challenges. Here is a list of some its major issues –

- **Security** – IoT creates an ecosystem of constantly connected devices communicating over networks. The system offers little control despite any security measures. This leaves users exposed to various kinds of attackers.
- **Privacy** – The sophistication of IoT provides substantial personal data in extreme detail without the user's active participation.
- **Complexity** – Some find IoT systems complicated in terms of design, deployment, and maintenance given their use of multiple technologies and a large set of new enabling technologies.
- **Flexibility** – Many are concerned about the flexibility of an IoT system to integrate easily with another. They worry about finding themselves with several conflicting or locked systems.
- **Compliance** – IoT, like any other technology in the realm of business, must comply with regulations. Its complexity makes the issue of compliance seem incredibly challenging when many consider standard software compliance a battle.

❖ IoT - CISCO Virtualized Packet Zone

Cisc1o Virtualized Packet Core (VPC) is a technology providing all core services for 4G, 3G, 2G, WiFi, and small cell networks. It delivers networking functionality as virtualized services to allow greater scalability and faster deployment of new services at a reduced cost. It distributes and manages packet core functions across all resources, whether virtual or physical. Its key features include packet core service consolidation, dynamic scaling, and system agility.



- Its technology supports IoT by offering network function virtualization, SDN (software-defined networking), and rapid networked system deployment. This proves critical because its virtualization and SDN support low-power, high flow networking, and the simple deployment of a wide variety of small devices. It eliminates many of the finer details of IoT systems, and conflicts, through consolidating into a single system and single technology for connecting and integrating all elements.

❖ **Internet of Things - Salesforce**

- The Salesforce IoT Cloud is a platform for storing and processing IoT data. It uses the Thunder engine for scalable, real-time event processing. Its collection of application development components, known as Lightning, powers its applications. It gathers data from devices, websites, applications, customers, and partners to trigger actions for real-time responses.

- Salesforce, a CRM leader, decided to enter this space due to the need to remain competitive in the coming era. The IoT cloud adds to Salesforce by expanding its reach, and the depth of its analytics.
- Salesforce combined with IoT delivers dramatically improved customer service with tighter integration and responses to real-time events; for example, adjustments in wind turbines could trigger automatic rebooking of delayed/canceled connecting flights before airline passengers land.

❖ **Electric Imp**

- The Electric Imp platform is Salesforce's recommended method for quickly connecting devices to the cloud. You develop applications through the Squirrel language; a high level, OO, lightweight scripting language. Applications consist of two modules: the device module, which runs on the device; and the agent module, which runs in the Electric Imp cloud. The platform ensures secure communication between the modules, and you send devices messages with a simple call −

  agent.send("nameOfmessage", data);

  Listen for messages on the agent with the following code

  − device.on("nameOfmessage", function(data) {

  //Data operations

  });
- Beyond these basic tasks, coding for device interaction, monitoring, and response resembles standard web application development, and uses a simple, easy-to-learn syntax.
- IoT (Internet of Things) is an advanced automation and analytics system which exploits networking, sensing, big data, and artificial intelligence technology to deliver complete systems for a product or service. These systems allow greater transparency, control, and performance when applied to any industry or system.
- IoT systems have applications across industries through their unique flexibility and ability to be suitable in any environment. They enhance data collection, automation, operations, and much more through smart devices and powerful enabling technology.
- This tutorial aims to provide you with a thorough introduction to IoT. It introduces the key concepts of IoT, necessary in using and deploying IoT systems.

❖ IoT Architecture

A. Objects Layer

The first layer, the Objects (devices) or perception layer, represents the physical sensors of the IoT that aim to collect and process information. This layer includes sensors an actuators to perform different functionalities such as querying location, temperature, weight, motion, vibration, acceleration, humidity, etc. Standardized plug-and-play mechanisms need to be used by the perception layer to configure heterogeneous objects .The perception layer digitizes and transfers data to the Object Abstraction layer through secure channels. The big data created by the IoT are initiated at this layer.

A. Object Abstraction Layer

Object Abstraction transfers data produced by the Objects layer to the Service Management layer through secure channels. Data can be transferred through various technologies such as RFID, 3G, GSM, UMTS, WiFi, Bluetooth Low Energy, infrared, ZigBee, etc. Furthermore, other functions like cloud computing and data management processes are handled at this layer .

B. Service Management Layer

Service Management or Middleware (pairing) layer pairs a service with its requester based on addresses and names. This layer enables the IoT application programmers to work with heterogeneous objects without consideration to a specific hardware platform. Also, this layer processes received data, makes decisions, and delivers the required services over the network wire protocols .

C. Application Layer

The application layer provides the services requested by customers. For instance, the application layer can provide temperature and air humidity measurements to the customer who asks for that data. The importance of this layer for the IoT is that it has the ability to provide high-quality smart services to meet customers' needs. The application layer covers numerous vertical markets such as smart home, smart building, transportation, industrial automation and smart healthcare .

D. Business Layer

The business (management) layer manages the overall IoT system activities and services. The responsibilities of this layer are to build a business model, graphs, flowcharts, etc. based on the received data from the Application layer. It is also supposed to design, analyze, implement, evaluate, monitor, and develop IoT system related elements. The Business Layer makes it possible to support decision-making processes based on Big Data analysis. In addition, monitoring and management of the underlying four layers is achieved at this layer. Moreover, this layer compares the output of each layer with the expected output to enhance services an

LEARNING FROM MICRO-PROJECT:

1] We Describe Artificial Intelligence, Machine Learning and deep learning

2] We Interpret IoT concept

CONCLUSION:

In The project entitled **"Internet of things"** we get the basic knowledge ofInternet of things. Even if he/she doesn't have any knowledge of Internet of things.

REFERENCES:

[1] Text books

[2] Refrence books

[3] Technical websites

Thank You