TechNanny

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF

THE DEGREE OF

BACHELOR OF ENGINEERING

IN

INFORMATION TECHNOLOGY

BY

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UNDER THE GUIDANCE OF

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(Department of Information Technology)

INFORMATION TECHNOLOGY

DEPARTMENT XAVIER INSTITUTE OF ENGINEERING

UNIVERSITY OF MUMBAI

2024 – 2025

Institute Vision

To nurture the joy of excellence in a world of high technology.

Institute Mission

To strive to match global standards in technical education by interaction with industry, continuous staff training and development of quality of life.

Department Vision

To nurture the joy of excellence in the world of Information Technology.

Department Mission

M1: To develop the critical thinking ability of students by promoting interactive learning.

M2: To bridge the gap between industry and institute and give students the kind of exposure to the industrial requirements in current trends of developing technology.

M3: To promote learning and research methods and make them excel in the field of their study by becoming responsible while dealing with social concerns.

M4: To encourage students to pursue higher studies and provide them awareness on various career opportunities that are available.

Program Education Objective (PEO)

After 3-5 years of graduation, Information Technology Engineering Graduates will be

PEO1: employed as IT professionals, and shall engage themselves in learning, understanding, and applying newly developed ideas and technologies as their field of study evolves.

PEO2: competent to use the learnt knowledge successfully in the diversified sectors of industry, academia, research and work effectively in a multidisciplinary environment.

PEO3: aware of professional ethics and create a sense of social responsibility in building the nation/society.

Program Specific outcome (PSO)

PSO1: Demonstrate the ability to analyze and visualize the business domain and formulate appropriate information technology solutions.

PSO2: Apply various technologies like Intelligent Systems, Data Mining, IOT, Cloud and Analytics, Computer and Network Security etc. for innovative solutions to real time problems.

Program Outcomes (PO)

Engineering Graduates will be able to

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

XAVIER INSTITUTE OF ENGINEERING

MAHIM CAUSEWAY, MAHIM, MUMBAI - 400016.

CERTIFICATE

This to certify that

Khizar Shaikh	(47)
Nelson Kolas	(02)
Samuel Pallikonda	(35)
Divyajyothi Raja	(01)

Have satisfactorily carried out the MINI-PROJECT work titled **TechNanny** in partial fulfillment of the degree of Bachelor of Engineering as laid down by the University of Mumbai during the academic year 2024-2025.

Internal Examiner/Guide **External Examiner**

Date:

Place: MAHIM, MUMBAI

DECLARATION

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources.

I also declare that I have adhered to all the principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission.

I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which thus have not been properly cited or from whom proper permission have not been taken when needed.

Khizar Shaikh (47) ----------

Nelson Kolas (02) ----------

Samuel Pallikonda (35) ----------

Divyajyoti Raja (01) ----------

Date:

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We would like to thank Fr. Dr. John Rose S.J (Director of XIE) for providing us with such an environment so as to achieve the goals of our project and for supporting us constantly.

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We would also like to thank our entire Information Technology staff who have willingly cooperated with us in resolving our queries and providing us with all the required facilities on time.

Khizar Shaikh ----------

Nelson Kolas ----------

Samuel Pallikonda ----------

Divyajothi Raja ----------

CLASS: BE IT **SEM**: VII

COURSE CODE: ITL 702 **COURSE NAME**: Internet of Everything Lab

AY: 2024-2025 **SUB IN-CHARGE:** Fr. Dr. John Rose S J

Lab Objectives:

The Lab experiments aim:

1. To learn different types of sensors.
2. To design the problem solution as per the requirement analysis done using sensors.
3. To study the basic concepts of programming/sensors/ emulators.
4. To design and implement the mini project intended solution for project-based learning.
5. To build and test the mini project successfully.
6. To improve the team building, communication and management skills of the students.

Bloom's Taxonomy Levels:

1 = Remembering, 2= Understanding, 3 = Applying, 4 = Analyzing, 5 = Evaluating, 6 = Creating

Lab Outcomes:

Sr. No.	Lab Outcomes	Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	**Outline** the requirements for the real-world problems.	L1,L2
2	**Summarize** the survey of several available literatures in the preferred field of study.	L1,L2
3	**Explain** and **Extend** software/ hardware skills.	L1,L2
4	**Develop** the project successfully by hardware/sensor requirements, coding, emulating and testing.	L1,L2,L3
5	**Determine** and present the findings of the study conducted in the preferred domain.	L1,L2,L3,L4
6	**Illustrate** the work in teams and manage the conduct of the research study.	L1,L2,L3,L4

Class/ Sem/ A.Y: BE IT/ VII/ 2024-2025

Course Name:

Group No. 10
Name & Roll No:

01 Khizar Shaikh
02 Nelson Kolas
03 Samuel Pallikonda
04 Divyajothi Raja

Mini Project

LO1: Outline the requirements for real-world problems.
LO2: Summarize the survey of several available literature in the preferred field of study.
LO3: Explain and Extend software/ hardware skills.
LO4: Develop the project successfully by hardware/sensor requirements, coding, emulating and testing.
LO5: Determine and present the findings of the study conducted in the preferred domain.
LO6: Illustrate the work in teams and manage the conduct of the research study.

Rubrics For Mini Project Work

Roll No.	Name of the Student	Problem Statement (05)	Creativity & Quality of Work done (04)	Punctuality & lab ethics (02)	Performance / Presentation (04)	Total (15)

Fr. Dr. John Rose S J

Subject In-charge

Lab Outcomes:

Sr. No.	Lab Outcomes	Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	**Outline** the requirements for the real-world problems.	L1,L2
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6	**Illustrate** the work in teams and manage the conduct of the research study.	L1,L2,L3,L4

LO-PO-PSO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
LO1	3	3	2	3						2			2	2
LO2				2		2		3	2	3			2	2
LO3	3			2	3								2	2
LO4	3	3	3	3	3	2	2	3	2	3	3	3	3	3
LO5	3							3	3	3	3	2	3	3
LO6	3							3	2	3	2	2	3	3

Project topic- PO/PSO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Project Topic	3	2	3	2	3	2	2	3	3	2	1	2	1	2

CHAPTER 1

INTRODUCTION TO IoE

Introduction to IoE and IoT

The Internet of Things (IoT) represents a transformative paradigm in which everyday objects are embedded with sensors, software, and connectivity, enabling them to collect and exchange data over the Internet. This technology facilitates real-time monitoring, automation, and communication among devices, paving the way for enhanced efficiency and innovation across various sectors. As a result, IoT has found applications in smart homes, healthcare, agriculture, and transportation, among others, significantly impacting how we interact with our environment.

The Internet of Everything (IoE) expands upon the IoT concept by incorporating not just devices but also people, processes, and data into a connected ecosystem. This holistic approach aims to create a more intelligent and responsive network, facilitating better decision-making and improved user experiences. By leveraging advanced analytics and machine learning, IoE can optimize operations, enhance collaboration, and drive economic growth, making it a crucial element in the digital transformation journey of businesses and societies alike.

History of IoE

The concept of the Internet of Everything (IoE) emerged as an evolution of the Internet of Things (IoT), which began gaining traction in the early 2000s. The term IoT was first coined by Kevin Ashton in 1999, referring to a network of physical objects connected to the internet. Initially focused on enabling devices to communicate with one another, IoT laid the groundwork for a more expansive vision. By the 2010s, the rapid advancement of wireless technologies, big data analytics, and cloud computing propelled IoT into mainstream applications, from smart homes to industrial automation. This surge in connectivity and data exchange highlighted the need for a broader framework that not only connected devices but also integrated people, processes, and data.

In 2013, Cisco introduced the term "Internet of Everything" to encapsulate this expanded vision. IoE aimed to create a more comprehensive ecosystem, emphasizing the importance of integrating various elements to enhance communication and intelligence within networks. As businesses and organizations began to adopt IoE strategies, they recognized its potential to drive innovation and efficiency across industries. The evolution of IoE has been further fueled by advancements in artificial intelligence, machine learning, and edge computing, enabling more sophisticated data analysis and decision-making processes. Today, IoE continues to shape our digital landscape, facilitating smarter cities, improved healthcare systems, and enhanced user experiences

Working of IoE (fond size-12)

The Internet of Everything (IoE) operates by interconnecting devices, people, processes, and data to create a comprehensive ecosystem that enhances decision-making and automation. The working of IoE involves several key components that interact seamlessly to provide meaningful insights and improved user experiences.

Architecture of IoE

The architecture of IoE can be broken down into four primary layers:

1. Device Layer: This layer consists of sensors and actuators embedded in physical objects, allowing them to collect data and perform actions based on commands received.

2. Network Layer: This layer facilitates communication between devices through various connectivity options, including Wi-Fi, cellular, and Bluetooth. It ensures reliable data transmission across the network.

3. Data Processing Layer: Once data is collected, it is sent to processing units where advanced analytics and machine learning algorithms analyze the information. This layer is crucial for deriving insights and making informed decisions.

4. Application Layer: The final layer includes user interfaces and applications that present the processed data to users. This layer allows individuals and organizations to interact with the IoE system, enabling real-time monitoring and control.

The following block diagram illustrates the architecture of IoE

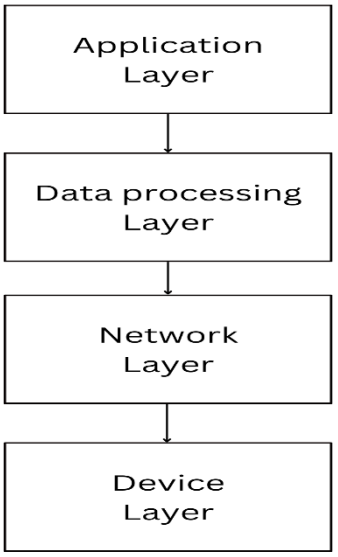

Figure 1 Architecture of IOE

1.2 **REAL-WORLD PROBLEMS AND THEIR IoT SOLUTIONS**

1. Security Concerns in Smart Homes

Problem: As smart home devices become more prevalent, security vulnerabilities have emerged, making homes susceptible to hacking and unauthorized access. With interconnected devices such as smart locks, cameras, and thermostats, a breach in one device can potentially compromise the entire system, leading to theft or privacy violations.

IoT Solution: Implementing robust security protocols is essential to protect smart homes. IoT solutions can include end-to-end encryption, regular firmware updates, and multi-factor authentication for device access. Additionally, employing a centralized security hub that monitors all connected devices for unusual activities can help detect and respond to threats in real-time. This proactive approach not only secures individual devices but also enhances the overall security of the smart home ecosystem.

2. Inefficient Energy Management

Problem: Many residential and commercial buildings suffer from inefficient energy usage, leading to increased utility costs and a larger carbon footprint. Traditional energy management systems often lack real-time data and automation capabilities, making it challenging to optimize energy consumption.

IoT Solution: Smart energy management systems utilizing IoT technology can address this problem effectively. By integrating smart meters and sensors throughout a building, real-time data on energy usage can be collected and analyzed. IoT-enabled devices can automatically adjust heating, cooling, and lighting based on occupancy and usage patterns, thereby reducing energy waste. Additionally, these systems can provide users with insights into their energy consumption, empowering them to make informed decisions and adopt more sustainable practices.

1.3 **APPLICATIONS OF IoE**

The Internet of Everything (IoE) encompasses a wide range of applications across various sectors. By integrating devices, people, processes, and data, IoE enhances efficiency, improves decision-making, and fosters innovation. Below are some prominent applications of IoE, along with brief introductions and accompanying figures.

1. Smart Cities

Introduction: Smart cities leverage IoE technologies to enhance urban living through improved infrastructure, efficient resource management, and better public services. By connecting various city components—such as traffic lights, waste management systems, and public transportation—smart cities can optimize operations and improve residents' quality of life.

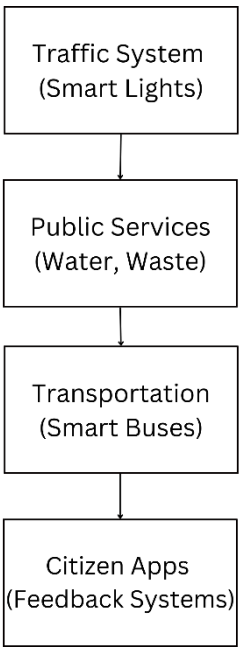

Figure 2 Smart City Infrastructure Design

CHAPTER 2

INTRODUCTION TO TechNanny

2.1 PROBLEM DEFINITION

Handling an infant remains stressful for working parents in today's technology-driven era. This stress can sometimes lead to neglecting important aspects of baby care, impacting the baby's health. Parents often struggle to keep track of their babies due to long work hours and outdated monitoring systems. Hiring a caretaker is expensive, and the stress of balancing work and childcare adds to the problem. Many existing systems fail to provide real-time updates or leverage modern technology effectively.

2.2 AIM AND OBJECTIVES

The primary aim of the TechNanny project is to develop an innovative smart cradle system that enhances the monitoring and care of infants, providing working parents with peace of mind and improved management of their child's health and well-being.

Objectives

1. Real-Time Health Monitoring: To integrate advanced sensors that continuously monitor the baby's temperature and pulse, ensuring that parents receive immediate alerts regarding any fluctuations that may require attention.

2. User-Friendly Dashboard: To create an intuitive digital dashboard that displays real-time health metrics and historical data, enabling parents to easily track their baby's growth and health trends.

3. Predictive Feeding Notifications: To implement a predictive analytics feature that estimates the next feeding time based on user input, helping parents maintain a consistent feeding schedule.

4. Mobile Accessibility: To ensure that the system can be accessed via mobile devices, allowing parents to monitor their baby's health metrics from anywhere, thus enhancing convenience and flexibility.

5. Eco-Friendly Design: To design the cradle with sustainable materials and energy-efficient components, making it an environmentally responsible choice for families.

6. Affordability: To develop the system in a cost-effective manner, ensuring that it remains accessible to a diverse range of families, without compromising on quality or functionality.

2.3 SCOPE OF PROJECT

1. Health Monitoring:
   - Integration of advanced sensors for real-time monitoring of temperature and pulse rates.
   - Development of alert systems that notify parents of any abnormalities or health concerns.
2. Data Management:
   - Cloud storage for securely storing health data, allowing for historical tracking and analysis.
   - Visualization tools on a digital dashboard that present health metrics in an easy-to-understand format.
3. Feeding Management:
   - Implementation of a feature that allows parents to log feeding times and receive predictions for the next feeding based on historical data.
   - Notifications to remind parents when feeding times approach, enhancing the feeding schedule consistency.
4. User Interface:
   - Design and development of a user-friendly mobile and web interface that allows parents to access data seamlessly.
   - Provision for parents to customize alert settings and preferences according to their needs.
5. Safety Features:
   - Incorporation of safety measures, such as secure connectivity to prevent unauthorized access to the system.
   - Design considerations to ensure the cradle is child-safe and made from non-toxic materials.
6. Sustainability and Affordability:
   - Use of eco-friendly materials in the cradle's design to promote environmental responsibility.
   - Aiming for a cost-effective solution that remains accessible to families from various socio-economic backgrounds.

7. Future Scalability:
   - Planning for potential future enhancements, such as integration with other smart home devices or advanced predictive analytics based on machine learning.
   - Developing the system architecture to support future upgrades without extensive overhauls.

2.4 FEATURES OF THE PROJECT

1. Temperature Monitoring:

a. Real-Time Tracking: Continuous monitoring of the baby's temperature using advanced sensors, ensuring immediate awareness of any significant changes.

b. Alert Notifications: Instant alerts sent to parents' devices if the temperature exceeds predefined safe thresholds, enabling timely intervention.

2. Crying Detection:

    a. Sound Monitoring: Integrated microphones that detect the baby's cries, enabling the system to respond appropriately.

3. Cloud Data Storage:

    a. Secure Data Management: All health metrics, feeding logs, and crying patterns are stored securely in the cloud for easy access and long-term tracking.

    b. Historical Data Access: Parents can view historical data to identify trends and make informed decisions about their baby's care.

4. User-Friendly Dashboard:

    a. Intuitive Interface: A digital dashboard accessible via mobile and web that displays real-time health metrics and feeding patterns in a clear, user-friendly format.

5. Mobile Accessibility:

    a. Remote Monitoring: Access to the system from any device, allowing parents to monitor their baby's health metrics and receive notifications while on the go.

6. Safety and Security:

    a. Data Encryption: Ensuring that all data transmitted between the cradle and cloud is securely encrypted to protect privacy.

7. Child-Safe Design: The cradle is designed with child safety in mind, using non-toxic materials and secure construction.

CHAPTER 3

REVIEW OF LITERATURE

[1] The paper introduces an innovative automatic cradle system designed to assist parents and guardians in infant care by incorporating advanced electronic features. Traditional cradles are manually operated and lack the convenience needed for modern, busy lifestyles. This project aims to enhance these systems with automation to provide practical, high-performance solutions.

[2] The paper reviews various existing solutions and innovations in baby cradle systems, emphasizing the need for smart cradles that integrate modern technology for better infant care. It highlights previous works that use IoT, GSM modules, cloud computing, and other technologies for monitoring and caregiving.

[3] The project develops an automated baby cradle to help busy parents monitor and care for their infants. Key features include automatic rocking, wet diaper and cry detection, and SMS alerts. Using an Arduino microcontroller and sensors, the system provides continuous monitoring and timely alerts, showcasing the application of embedded systems and IoT to offer an affordable and convenient solution for remote infant care.

[4] the author suggest a design specification document describes the design details of the smart baby cradle prototype. The final smart baby cradle product will also follow this design document but the electronic components will be changed to more effective and integrated devices. In this document, all the designs will consider the customer and safety requirements that were mentioned in the functional specification. The requirement labels in this document corresponds to the functional specification requirement labels. The limitation are Baby's curiousness: Beside the risk of electrical shock, the components may fall off or be broken by the baby and the baby might even try to bite or eat the parts. Parents' worries: Parents consider the safety issues much more than the features products.

CHAPTER 4

IMPLEMENTATION METHODOLOGY

4.1 Design

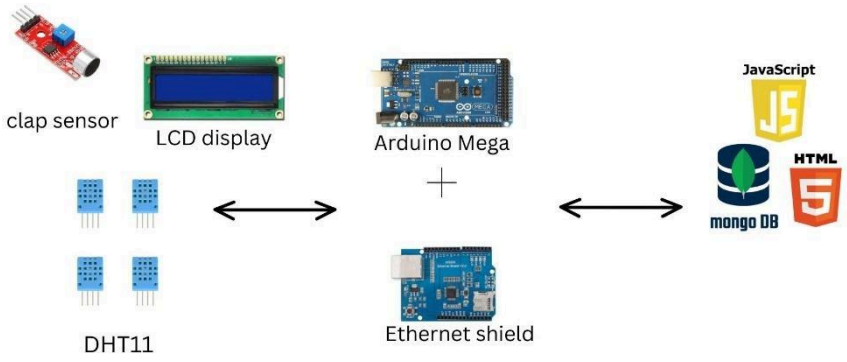

Fig 3 System Design & Architecture

4.2 REQUIREMENTS OF HARDWARE & SOFTWARE

HARDWARE REQUIREMENTS

1. **Arduino Mega:** The Arduino Mega is a microcontroller board based on the ATmega2560 chip. It provides a large number of digital and analog input/output pins, making it suitable for controlling and interfacing with various sensors, actuators, and peripherals in the solar-powered lighting system. The Arduino Mega serves as the central control unit, responsible for processing sensor data, executing control algorithms, and coordinating the operation of other components.

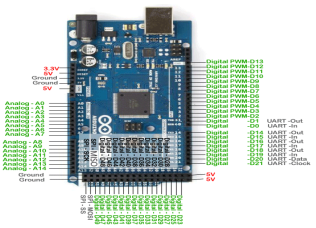

Fig 4 Arduino Mega

2. **DHT11:** The DHT11 is a digital temperature and humidity sensor commonly used in DIY electronics and home automation projects. It operates using a thermistor for temperature and a hygroscopic material for humidity, outputting a digital signal via a single-wire protocol. With a temperature range of 0°C to 50°C and humidity range of 20% to 80%, it offers reasonable accuracy but is limited compared to more advanced sensors. The DHT11 is easy to interface with microcontrollers like Arduino, making it a popular choice for hobbyists looking to monitor environmental conditions.

Fig 5 DHT11

3. **Ethernet Sheild:** An Ethernet latch is a mechanism used in networking devices to temporarily hold or "latch" the status of a connection or signal. This functionality is particularly important in applications requiring reliable communication, such as in industrial automation or smart home systems. The latch can be employed to maintain the state of an Ethernet connection, ensuring that data packets are processed in the correct order and that network reliability is upheld even during transient failures or interruptions.

Fig 6 Ethernet Sheild

4. **LCD Display:** An LCD (Liquid Crystal Display) is a flat-panel technology used to display visual information in various devices, from calculators to televisions and computer monitors. LCDs work by manipulating light through liquid crystals sandwiched between layers of glass or plastic. When an electric current passes through the crystals, they change alignment, allowing varying amounts of light to pass through and creating images or text.

Fig 7 LCD Display

5. **Clap Sensor:** A clap sensor is a simple sound detection device that responds to the sound of a clap or similar loud noise. It typically consists of a microphone, an amplifier, and a microcontroller or other circuitry to process the sound signal. When a clap is detected, the sensor can trigger an action, such as turning on a light, activating a device, or sending a signal to another component in a project.

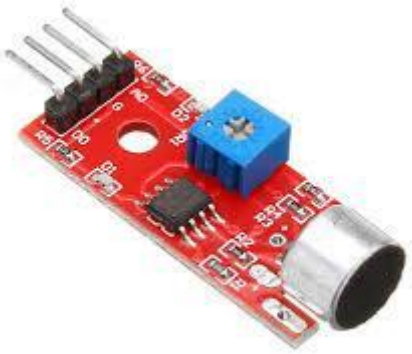

Fig 8 Clap Sensor

SOFTWARE REQUIREMENTS

1.Arduino IDE: The Arduino Integrated Development Environment (IDE) is a software application used to write, compile, and upload code to Arduino microcontroller boards. It provides a user-friendly interface for writing programs in the Arduino programming language, which is based on Wiring and C/C++. The Arduino IDE includes a text editor with syntax highlighting, a compiler, and tools for managing libraries and uploading code to Arduino boards via USB or other communication interfaces. Additionally, the Arduino IDE supports serial communication for debugging and monitoring program output. For the solar-powered lighting system project, the Arduino IDE is used to develop the firmware that controls the behavior of the Arduino Mega microcontroller, including reading sensor data, implementing control algorithms, and interfacing with peripheral devices such as LEDs, motors, and sensors.

2.Tinkercad: Tinkercad is an online platform for designing and simulating electronic circuits and 3D models. It provides a drag-and-drop interface for assembling components and wiring connections, making it easy to prototype and visualize electronic projects without the need for physical hardware. Tinkercad includes a library of electronic components, including Arduino boards, sensors, actuators, and other devices commonly used in electronics projects. Users can create and simulate circuits in Tinkercad's virtual environment, test their designs, and troubleshoot potential issues before building physical prototypes. Tinkercad also offers collaboration features, allowing multiple users to work on the same project simultaneously. For the solar-powered lighting system project, Tinkercad can be used to design and simulate the electronic circuitry, including the connections between Arduino Mega, sensors, LEDs, motors, and other components. This enables developers to validate their designs, refine the system architecture, and verify the functionality of the hardware before implementation.

3.MongoDB Atlas: MongoDB Atlas is a cloud-based database service provided by MongoDB that allows users to deploy, manage, and scale MongoDB databases in the cloud. It simplifies the process of running MongoDB by handling many of the operational tasks, such as backups, monitoring, and security, allowing developers to focus on building applications.

4.Nodejs: Node.js has revolutionized the way developers approach server-side programming by allowing them to use JavaScript, a language traditionally confined to the browser. This unification of front-end and back-end development fosters a more cohesive development experience, enabling teams to work more efficiently.
One of the standout features of Node.js is its ability to handle asynchronous operations through callbacks, promises, and the async/await syntax, which simplifies writing non-blocking code. This is particularly beneficial for I/O-heavy applications, such as those that interact with databases or external APIs, as it allows other processes to continue while waiting for responses.

4.3 Results:

Hardware System output: -

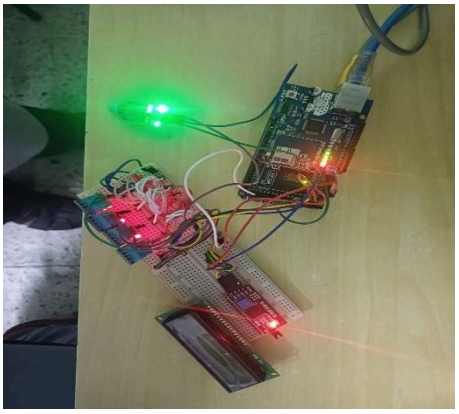

Fig 9 Working of System

Software System output: -

```
const mongoose = require('mongoose');

// Define the baby schema
const babyTempSchema = new mongoose.Schema({
  currentTime: {
    type: Date,
    default: () => {
      const now = new Date();
      return new Date(now.getTime() + (330 * 60 * 1000)); // Convert to IST (UTC +5:30)
    },
  },
  temperature: {
    type: Number,
    required: true, // Make this field required
  }
});
```

Fig 10 Database Schema

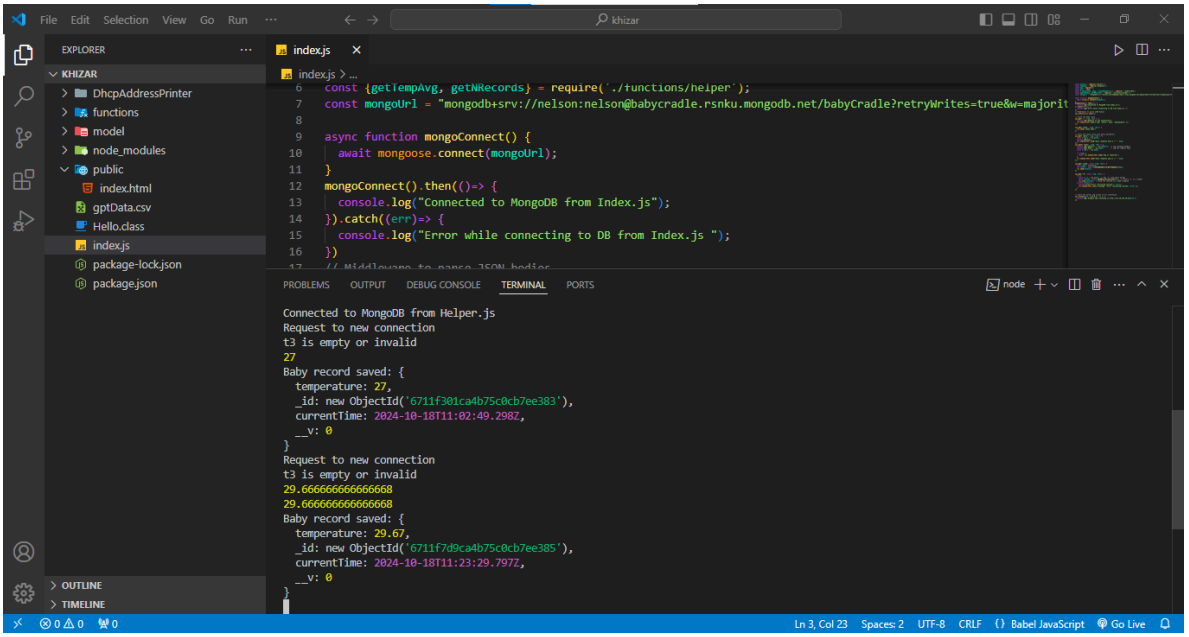

Fig 11 server code

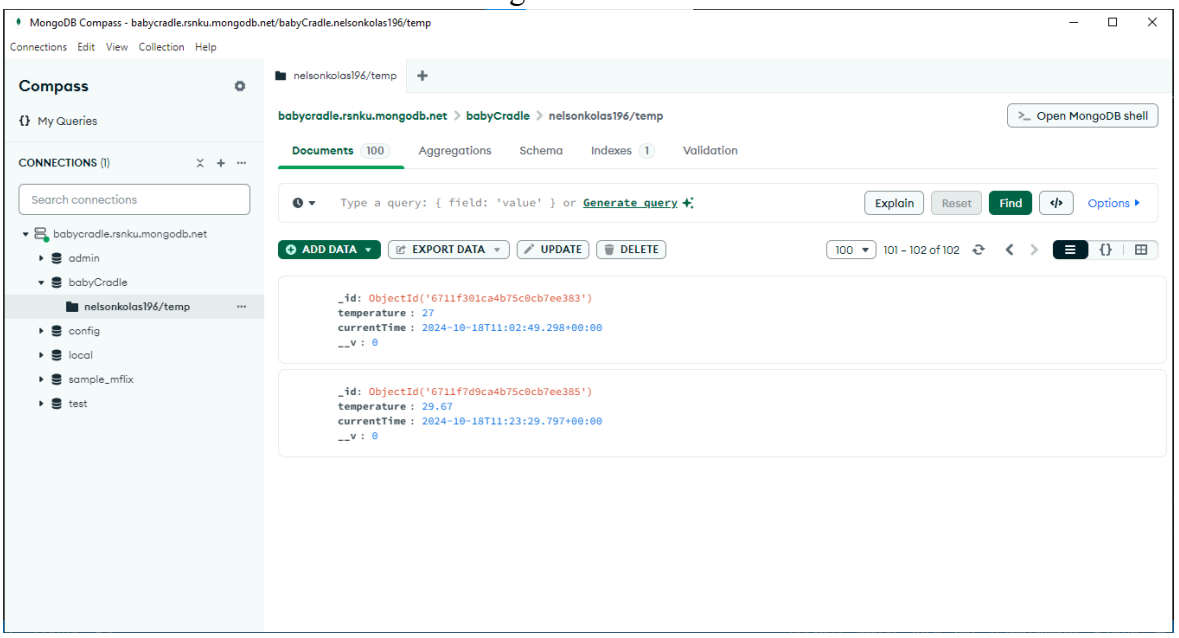

Fig 12 MongoDB Atlas

CONCLUSION AND FUTURE SCOPE

Conclusion

The TechNanny project aims to revolutionize infant care for working parents by leveraging modern technology to create a smart cradle system. By integrating real-time health monitoring, predictive feeding notifications, and a user-friendly dashboard, TechNanny addresses the critical challenges faced by parents today. The project's focus on safety, eco-friendliness, and affordability ensures that it caters to a wide range of families, providing

peace of mind while enhancing the overall well-being of infants. With its innovative approach, TechNanny not only improves the monitoring and care of infants but also empowers parents to make informed decisions about their child's health and development.

Future Scope

The future scope of the TechNanny project is vast, with opportunities for expansion and enhancement in various areas:

1. **Advanced Predictive Analytics**: Incorporating machine learning algorithms to analyze health data could provide even more accurate predictions for feeding times and potential health concerns, tailoring recommendations to individual babies.

2. **Integration with Smart Home Devices**: Future iterations of TechNanny could enable seamless integration with other smart home technologies, such as smart lights or thermostats, allowing for a more cohesive home automation experience.

3. **Expanded Health Monitoring**: Adding features for monitoring additional health metrics, such as sleep patterns or movement tracking, would further enhance the system's capabilities, providing a more comprehensive view of the baby's health.

4. **Multi-Child Support**: Developing functionality to support monitoring multiple children from a single account could benefit families with more than one infant, offering tailored insights for each child.

5. **Telehealth Integration**: Collaborating with healthcare providers to allow secure sharing of health data with pediatricians could facilitate remote consultations and personalized care recommendations.

6. **Customization and Personalization**: Enhancing the dashboard with more customization options for parents, such as setting specific health goals or preferences for alerts, could improve user experience.

7. **User Feedback and Community Features**: Creating a platform for parents to share experiences and tips could foster a supportive community, while also providing valuable feedback for continuous improvement of the TechNanny system.

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