



Tracking Of Breastmilk Status Using Neoteric Technology

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Abstract Breast milk monitoring using neoteric technology is a cutting-edge approach that revolutionizes the analysis and understanding of breast milk composition and quality. By harnessing advanced technological solutions, researchers, healthcare professionals, and lactating mothers can gain valuable insights into the nutritional content and health benefits of breast milk. Neoteric technology, such as spectroscopy, microfluidics, biosensors, and data analytics, enables precise and comprehensive analysis of breast milk components, including proteins, fats, carbohydrates, vitamins, and minerals. This project proposes a Breast milk Monitoring Using Neoteric Technology. The system comprises several sensors, including a pH sensor, DHT11 temperature and humidity sensor, and a gas sensor. Additionally, a Radio Frequency Identification (RFID) module is employed to identify the nursing mother. The system collects data from these sensors and sends it wirelessly to the Blynk app via the ESP8266 module. The system

utilizes the Neoteric technology, which provides real-time data monitoring and analysis capabilities. The integration of the Arduino UNO, ESP8266, and Blynk app offers a comprehensive solution for breast milk quality monitoring and maternal health management.

Keywords – breastmilk, Blynkapp, ESP8266, Arduino UNO , DHT11, pH Sensor, Neoteric

I.INTRODUCTION

Breast milk monitoring using neoteric technology is a cutting-edge approach that revolutionizes the analysis and understanding of breast milk composition and quality. By harnessing advanced technological solutions, researchers, healthcare professionals, and lactating mothers can gain valuable insights into the nutritional content and health benefits of breast milk

A literature review has showed there are many studies made



[1]Usha Ramanathan says that”Utilizing IoT sensor technology, the REAMIT project ensures continuous monitoring of human milk quality during transportation, enhancing donor milk safety and accessibility.”

[2]”Qingxin Chen explores integrating IoT in infant dairy industry management amid family planning policy adjustments.”

[3]“Sakshi Takkar’s review explores IoT-enabled smart bin systems for efficient waste management, integrating sensors and advanced technologies like IoT, Big Data, and Cloud Computing.”

[4]”M. Afshar Alam’s study proposes a blockchain-based AI approach for creating a smart and sustainable farming environment to address challenges in real-time agricultural monitoring and management.”

[5]”Pavithra Devi.R proposes an RFID-based breast milk monitoring system integrating humidity, temperature, pH, and color sensors for automated and accurate classification and monitoring, enhancing neonatal care.”

II.SYSTEM DESCRIPTION

The proposed system integrates various sensors such as a pH sensor, DHT11Temperature and humidity sensor, and a gas sensor. Additionally, it utilizes a Radio Frequency Identification (RFID) module to identify the nursing mother.

Data from these sensors is wirelessly transmitted to the Blynk app via the ESP8266 module for convenient monitoring. Powered by Neoteric technology, the system ensures real-time data Monitoring and analysis. The ultimate goal of this project is to provide nursing mothers with a reliable And easy-to-use system that can ensure the safety and nutritional quality of their Breastmilk, These sensors provide accurate and detailed information about breast milk expression,

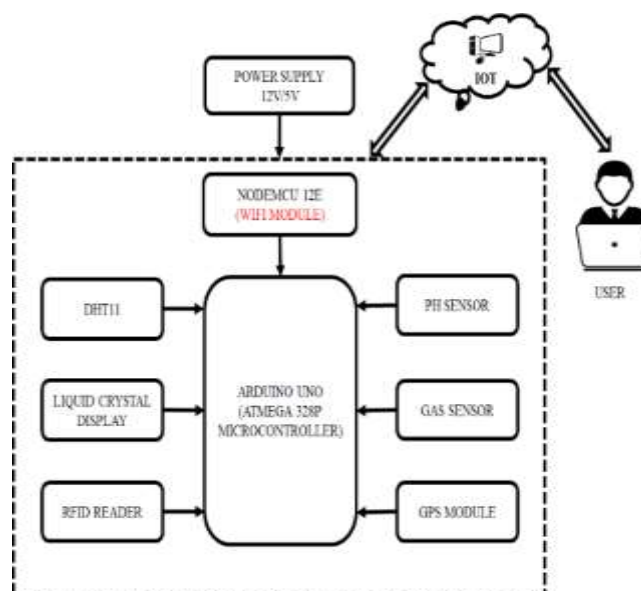


Fig 1 Proposed system Block Diagram

Arduino UNO Microcontroller

Arduino is an open source electronics platform based on easy to use hardware and software. It is a microcontroller board based on the ATmega328. It has 14 digital input/output pins, 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an



ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. Arduino is an open-source electronics platform that includes both hardware and software components. The Arduino microcontroller refers to the microcontroller boards developed by Arduino LLC (formerly Arduino Srl) and its affiliated community. These boards are designed to be easy to use, versatile, affordable, making them popular for various projects and applications.

NODEMCU

Employing NodeMCU for breast milk monitoring through neoteric Technology presents a cutting-edge solution for ensuring the quality and safety of Breast milk storage and transportation. By integrating NodeMCU, a versatile IoT Development platform, into the monitoring system, caregivers can remotely Monitor key parameters such as temperature, humidity, and pH levels in real-Time. This enables proactive intervention in case of any deviations from optimal Storage conditions, thereby safeguarding the nutritional integrity of breast milk.

Power Supply

In monitoring of pollution in the environment using an IoT system, a reliable 5V power supply serves as the backbone to ensure continuous operation Of the sensors, communication modules, and other components of the system. The power supply unit is typically designed to convert alternating current (AC) from mains electricity into direct current (DC) at 5V, suitable for powering IoT devices efficiently. This supply unit may incorporate features such as voltage regulation, overcurrent protection, and surge suppression to safeguard the connected equipment from fluctuations or disturbances in the electrical supply. By providing a stable and consistent power source, the 5V power supply ensures uninterrupted operation of the sensors deployed in the environment for pollution monitoring.

RFID Reader

Incorporating RFID reader technology into breast milk monitoring systems Using neoteric technology revolutionizes the way caregivers ensure the quality And safety of breast milk storage and distribution. By deploying RFID readers at critical checkpoints in the supply chain, such as Storage facilities and transportation hubs, each container of breast milk can be Accurately identified and tracked in real-time.

DHT11 Sensor



In the realm of neoteric technology, the DHT11 sensor offers a groundbreaking avenue for revolutionizing breast milk monitoring. By harnessing its capabilities, caregivers can delve into a realm of precision and insight previously unattainable. The sensor's adeptness at measuring temperature and humidity becomes a cornerstone for ensuring optimal storage conditions, safeguarding the nutritional integrity of breast milk. Neoteric advancements amplify its potential, facilitating real-time monitoring accessible through intuitive interfaces, empowering caregivers with unprecedented control and awareness. Predictive analytics, seamlessly integrated into the system, forewarn of potential spoilage or contamination, enabling proactive interventions. Moreover, the fusion of DHT11 sensor data with smart devices ushers in a new era of automation, where storage conditions are finely tuned to perfection. Here we are using DHT11 (Digital Temperature Humidity. 11th version)

PH Sensor

In the realm of neoteric technology, the incorporation of pH sensors into breast milk monitoring systems introduces a groundbreaking dimension of precision and assurance. PH sensors, renowned for their ability to accurately measure acidity or alkalinity levels, serve as indispensable tools for

assessing the freshness and quality of breast milk.

GAS Sensor

Gas sensors are devices that help us understand the amount of gas in the Environment and the natural state of its movement. Gas sensors reveal the amount Of gas in the environment and the nature of the gas composition with electrical Signals and can provide its change. Here we used it to detect Oxygen level Of milk.

GPS Module

The integration of a GPS module into breast milk monitoring systems. By incorporating GPS capabilities, caregivers Can precisely monitor the location and movement of breast milk shipments, Ensuring timely delivery and minimizing the risk of spoilage. This innovative Approach enables real-time tracking of breast milk transportation, facilitating Efficient logistics management and quality control throughout the supply chain.

Liquid Crystal Display

Liquid Crystal Displays (LCDs) can be employed in neoteric breast milk monitoring systems to provide caregivers with real-time information about the conditions of breast milk storage. By integrating LCD screens into monitoring devices, caregivers can easily visualize crucial data such as possibly even pH levels. Neoteric technology enhances this by



incorporating advanced features like touchscreens.

RFID Tags

RFID tags are small electronic devices that store information and communicate With other devices using radio waves. RFID tags are used in a variety of Applications, from tracking inventory to monitoring the movements of livestock.

Blynk App

Blynk is an IoT platform with IOS and Android apps that enables users to control Photons, Arduino, Raspberry Pi, NodeMCU and similar devices over the Internet. The Blynk App contains an impressive range of pre-built widgets that you can use to represent data sent from your IoT device and/or control your IoT device. Blynk App - mobile applications that allow you to interface with your IoT devices.

III. PROTOTYPE VIEW

Fig 2 Hardware View

This Project breast milk Monitoring using neoteric technology was implemented. The integration of neoteric technologies such as Arduino Microcontroller, NODEMCU, RFID Reader, DHT11 Sensor, pH Sensor, Gas Sensor, Liquid Crystal Display, GPS Module, and Blynk App has revolutionized the monitoring of



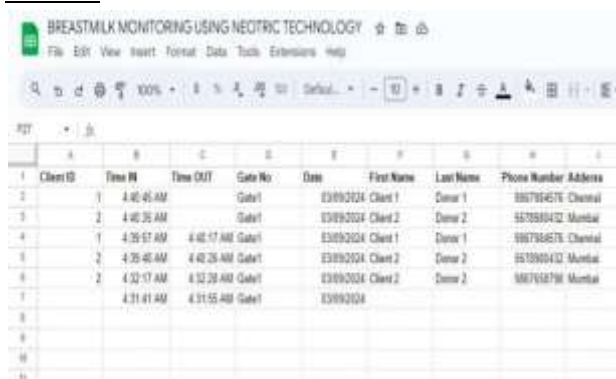
breast milk, ensuring heightened accuracy, efficiency, and convenience. Additionally, it utilizes a Radio Frequency Identification (RFID) module to identify the nursing mother. Data from these sensors is wirelessly transmitted to the Blynk app via the ESP8266 module for convenient monitoring.

IV. EXPERIMENTS AND RESULTS

Powered by neoteric technology, the system ensure the real time data monitoring and analysis. By combining Arduino UNO, ESP8266 and Blynk app, this solution offers a holistic approach to breastmilk quality monitoring and maternal health management.



DONOR INFORMATION STORED USING RADIO FREQUENCY IDENTIFICATION READER AND TAGS



ID	Client ID	Time IN	Time OUT	Gate No	Date	First Name	Last Name	Phone Number	Address
1	1	4:40:45 AM		Gate1	E3892024	Client 1	Donor 1	987654321	Chennai
2	2	4:40:35 AM		Gate1	E3892024	Client 2	Donor 2	543210987	Mumbai
3	1	4:39:57 AM	4:40:17 AM	Gate1	E3892024	Client 1	Donor 1	987654321	Chennai
4	2	4:39:40 AM	4:40:25 AM	Gate1	E3892024	Client 2	Donor 2	543210987	Mumbai
5	2	4:32:17 AM	4:32:29 AM	Gate1	E3892024	Client 2	Donor 2	987654321	Mumbai
6	1	4:31:41 AM	4:31:55 AM	Gate1	E3892024				

Fig 3 Donor information

LEVEL OF TEMPERATURE, HUMIDITY AND OXYGEN LEVEL OF MILK AND LOCATION DETAILS (Longitude and latitude) OF MILK



BOTTLES

Fig 4 Levels of Temperature ,Humidity and Oxygen level of milk and Location Details (Longitude and latitude) Of MILK Bottles

LEVEL OF pH

pH level here will displayed in a Liquid Crystal Display



Fig 5 LEVEL of pH

V.CONCLUSION

In this project, the integration of neoteric technologies such as Arduino Microcontroller, NODEMCU, RFID Reader, DHT11 Sensor, PH Sensor, Liquid Crystal Display, GPS Module, and Blynk App has revolutionized the monitoring of breast milk, ensuring heightened accuracy, efficiency, and convenience. Here caregivers and Healthcare professionals can monitor critical parameters like temperature, pH levels, and location in real-time, offering unprecedented insights into the quality and safety of breast milk. With the advent of such innovative solutions, the landscape of breast milk monitoring is poised for continuous evolution, promising enhanced safety and well-being for infants worldwide.

VI. REFERENCES

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