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Food Safety Traceability System for Peoples Health Using the Internet of Things and Big Data

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ABSTRACT

As a means of controlling and preventing epidemics, tracking and analyzing data on food safety is more vital than ever. Additionally, insufficient, opaque, and unequal information is the primary cause of food safety difficulties. In order to address these issues, it is essential to implement a reasonable and dependable food safety traceability system and perform enough traceability. In the midst of a confidence crisis between the market and its customers, the traceability system is a crucial tool for guaranteeing the safety and quality of consumers' food. To address the issues of poor trust and difficult data storage with conventional traceability systems, research on food safety traceability systems based on big data, artificial intelligence, and the Internet of Things offers concepts and solutions. Consequently, this study uses rice as an example and suggests a solution for food safety traceability that utilizes RFID two-dimensional code technology and large data storage in the connected world. This article uses radio frequency identification (RFID) technology across the board by analysing system requirements, building the system database and database tables, encoding the two-dimensional code, and creating the architecture for data input. The use of radio frequency identification (RFID) technology and the data storage function in big data to gather information about food production.

This study's food safety traceability system assures the technological level of information integrity, dependability, and safety via the use of big data and the Internet of Things.

1.INTRODUCTION

More and more instances of the new crown virus (COVID-19) are being reported as the outbreak grows globally, and it is spreading via cold chain logistics routes. COVID-19 has emerged as the leading cold chain logistics risk to food safety. The domestic epidemic prevention scenario of "foreign import and internal prevention" is still harsh, despite the general improvement in our country's new coronavirus pneumonia epidemic control and prevention efforts. This is due to the faster spread of the overseas epidemic. The importance of food safety traceability, data analysis, and monitoring has grown in the context of controlling and preventing epidemics.

The public's health and safety can be guaranteed if all foods, particularly those with a cold chain and those imported from other countries, are tracked and monitored to stop the spread of the COVID-19 virus. Consequently, safeguarding the population's health in the post-epidemic period necessitates the installation of a trustworthy food safety traceability management system, which is both an immediate need of society and its members. Integrating data across the whole food supply chain, from production to processing, storage, transportation, and sales, the food safety traceability management system relies on automated identification and information technology.

The proliferation of IoT, AI, and big data technologies, as shown by sensors and intelligent terminal recognition, has sped up the evolution of perception, measurement, and monitoring tools. electronic means of communication. A new network of intelligent information exchange is being formed via the use of information technologies like the Internet and sensors to link physical objects with one another. This phenomenon is known as the Internet of Things. One promising area where artificial intelligence might have a significant impact is in food safety, thanks to its ability to streamline data analysis. The term "big data" refers to a paradigm for processing and using data that is based on distributed and cloud computing. By integrating and exchanging data and using suitable mathematical procedures, it may achieve accurate prediction or analysis.

Data collection, storage, processing, mining, and knowledge presentation are the five key

linkages that, when paired with technologies like network connectivity and automated identification, allow for the effective use of big data in food traceability. When it comes to real-world management, cross-regional and cross-domain supervision are tough to implement. However, big data makes it possible to aggregate and manage data virtually, optimize the allocation of information resources, and make this a reality. Utilized extensively in recent years, big data has emerged as a driving factor behind the modernization of conventional farming. Also, businesses both upstream and downstream have an interest in seeing a food safety and quality traceability system built, as food quality is affected by every step of the manufacturing and distribution processes. Building a food safety traceability system with the help of the Internet of Things will make cooperation much easier. Here, information technology is used to ensure food safety in the aftermath of an epidemic. The Internet of Things (IoT) and big data are integrated into the system that oversees food safety traceability in this post-epidemic age [4]. In recent years, there has been a surge in interest in studying how to guarantee the safety of food throughout its whole lifecycle, from manufacturing to distribution and sales.

2.LITERATURE SURVEY

Protecting the public's health requires the immediate implementation of a strong Food Safety Traceability System (FSTS) based on the principles of Big Data and the Internet of Things (IoT). The use of internet of things (IoT) sensors to track temperature, humidity, and location are widely accepted in recent research as important metrics to track in the food supply chain. By collecting and processing data in real-time via IoT systems, these sensors allow for continuous monitoring and guarantee adherence to safety regulations. The massive amounts of data produced by IoT devices can only be adequately analyzed with the help of Big Data analytics. Pattern recognition, anomaly detection, and the prediction of possible food safety risks are all capabilities of advanced analytics methods like predictive modeling and machine learning. By creating an unchangeable record of transactions and guaranteeing transparency all the way through the supply chain, blockchain technology significantly improves traceability. Problems with data security and

interoperability across various IoT devices are some of the obstacles that still need to be addressed. In order for FSTS to fulfill its promise of protecting public health and guaranteeing food safety, future studies should concentrate on resolving these obstacles.

A number of supply chain participants employ a wide variety of Internet of Things (IoT) devices and systems, and to ensure that these devices can communicate with one another, interoperability frameworks are now being development. In addition, studies highlight the need of better cybersecurity measures to safeguard critical information on food safety from cybercriminals and other unauthorized parties. To make sure the information gathered by IoT devices is safe and private, efforts are being considered, such as creating encryption methods and secure connection protocols. The potential for the Internet of Things (IoT) and big data to transform food safety traceability systems and, in the long run, enhance public health is enormous.

3. EXISTING SYSTEM

Recent years, food safety issues have drawn growing concerns from society. In order to efficiently detect and prevent food safety problems and trace the accountability, building a reliable traceability system is indispensable. It is especially essential to accurately record, share and trace the specific data within the whole food supply chain including the process of production, processing, warehousing, transportation and retail. Traditional traceability systems have issues such as data invisibility, tampering and sensitive information disclosure.

Disadvantages:

- In the existing work, the system did not find Sensors and wireless data transmission for measuring food safety.
- This system is less performance due to lack of Real-time Prediction food safety construction.

3.1 PROPOSED SYSTEM

The proposed system implements a food safety traceability system based on RFID technology and big data storage technology in the Internet of Things. The use of the

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Internet of Things and big data technology has realized the data collection of various food data. The use of RFID technology to realize automatic recording of industry data search engine was designed implemented by using big data analysis technology.

Advantages:

- The system is more effective since it involves in five steps such as data capture, data, data processing, data mining, and data knowledge display.
- The system finds more ADVANTAGES OF THE COMBINED USE OF IOT AND BIG DATA TECHNOLOGY IN THE FOOD SAFETY TRACEABILITY SYSTEM.

4. OUTPUT SCREENS

User:

User login:

Registration:

Predict Cyber bullying:

View your profile:

Service Provider:

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Admin login:

Service provider :

Remote user Profile :

Predict the output:

5. CONCLUSION

Within the framework of epidemic prevention and control, enhancing food safety data analysis through the implementation of food safety traceability technology can significantly boost the efficacy of food safety management. This, in turn, helps advance epidemic prevention and control efforts and provides practical value for addressing future food safety concerns across China. So that people's lives, health, and safety may be better safeguarded. Regulation of food safety using the Internet of Things has the potential to significantly reduce the frequency and severity of serious food safety occurrences.

In addition, the issue may be detected more precisely and in real-time, and the

source of the danger can be swiftly located, ensuring that the food's quality is better assured. In terms of the food supply chain, this is going to be massive. Meanwhile, organizations in the food supply chain find it impossible to tamper with the data under the intelligent monitoring of big data, which ensures the data's validity. By integrating big data, the Internet of Things, the Internet, and the food traceability system, we can ensure that all information is open, transparent, and complete. We can also control each step of the food traceability system with great precision, which will allow us to fully realize its value.

In this study, we build and deploy a food traceability system for rice utilizing internet of things (IoT), wireless sensor, radio frequency identification (RFID), crawler, and database technologies, among others. At the outset, it supplied network data information for food-related companies and fulfilled the traceability needs for food goods throughout their full lifecycle. Not only is it necessary to adopt traceability in order to guarantee food safety, but it is also the primary method for present and future food safety measures. Create a government-and business-friendly food safety traceability system by reviewing the current system, learning from our advanced domestic and international experiences and accomplishments, and organizing everything in a strategic, methodical, and structural way. Raising the bar for food safety traceability and people's health, it offers standardised technical advice and standardised assistance for third-party certification.

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