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ijirset@gmail.com

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Food Quality Feedback System

Ganesh Kumar M¹, Prof. S. P Kharde², Dr. Jayant R. Mahajan³

¹ UG Student, Department of Electronics and Telecommunication Engineering, SYCET,
Aurangabad(MS), India

² Guide, Department of Electronics and Telecommunication Engineering, SYCET,
Aurangabad(MS), India

³ HOD, Department of Electronics and Telecommunication Engineering, SYCET,
Aurangabad(MS), India

Abstract: In order to compare centralized feedback systems, we first looked at well-known catering companies and service businesses. As a result, recommendations for effective quality management, data collecting, and analysis might be made. Following the comparative examination, we turned our attention to literature and made pertinent observations. We developed the most recent option, which incorporates a 7" touchscreen display on a Raspberry Pi B+. The methodologies we looked at for our research are listed below.

Keywords: Centralized Feedback Systems, Machine Learning, Raspberry Pi B+, GUI feedback.

I. INTRODUCTION

We still have a problem with poor food quality in India. To increase the food system's environmental sustainability, all actors in the food chain have the potential to be significant contributors. However, it has grown to be incredibly challenging to link worries about food safety and environmental threats to consumer preferences or approaches to food production. The globalization of the food industry poses a risk of filtering out or masking signs of unhealthy local ecosystems or production systems.

Consumers are unlikely to receive information on the environmental effects of various food supply chain elements, nor are producers likely to hear from consumers. This is due to the separation of the two in geography and time, which was made possible by innovations in agriculture and transportation as well as the extensive trading of food goods across vast distances. As environmental problems grow in scope, institutions (i.e., social norms and rules; see North (1990)) for managing feedback information between the various sections of the system are needed to be established or strengthened. In other words, feedback loops are not tightly controlled. In order to create a sustainable food system, it is critical to identify strategies for tying together the feedback loops between ecosystems, primary production, and society.

II. METHODOLOGY

With a significant number of successful cases in numerous study fields, machine learning has been proven to be a cutting-edge technology. These methods have recently been used extensively to assess the quality of food. In this article, new advances in machine learning approaches for predicting food quality and safety are reviewed. The supply of premium products with no flaws to consumers is the main priority since it greatly enhances the competitiveness of production units. This study compares various methods for rating various types of foods in great depth after giving a quick overview of machine learning techniques. Planning meals and assessing their quality are becoming increasingly significant aspects of contemporary culture. With scientific insight and agricultural advancements, we can effectively evaluate crop quality utilizing a variety of learning techniques that replace inconsistent, unpredictable, and time-consuming manual effort. Fuzzy logic has effectively demonstrated its value and established itself as a viable alternative to automation, offering a positive outlook for the future. Currently, the food industry's top priority is food quality.

Food businesses must develop quality monitoring systems in order to effectively identify issues with food quality as they are being produced. However, data manipulation and centralized storage have turned into hurdles to reliability in a standard quality monitoring system. Traditional quality monitoring methods are typically ineffective as a result of insufficient automation. Thankfully, block chain is a promising, decentralized, and tamper-proof technology. Additionally, because they are self-executing and self-verifying, smart contracts, which are executable codes on the block chain network, can perform transactions between parties who do not trust one another. This study introduces an intelligent quality monitoring system for fruit juice manufacturing that combines smart contracts and quality rating models. The high automation and excellent reliability of this system are its main features. This method determines the best production conditions for each step based on response surface models built from preproduction data. Smart contracts are carried out during the real production process in order to store production information on a block chain. The inputs for the evaluation models are these data. Smart contracts will make the decision of whether or not to restart the production process based on the results of the evaluation.

III. SYSTEM MODELLING

The block diagram of the Food Quality Feedback System is shown in Fig. 1. The 7" Raspberry Pi Display, power adapter, input devices, and interfacing module are all included. Each person's feedback will be kept in the main server's database. The touch screen display also has a GUI (Graphical User Interface) for entering feedback. The use of a GUI enables quick understanding of parameters using common elements. Both the Raspberry Pi controller and monitor are powered by a 5-volt power adaptor. Additionally, a Raspberry Pi case is offered to safeguard the controller and display. The GUI displays Excellent, Good, and Average comments. A second GUI appears to let the user decide the explanation for the average feedback if they choose Average. Taste of food, food hygiene, and quantity of food are listed as the reasons on the second screen of the GUI. The person must choose the explanation for why he judged the food to be of average quality based on his experience. After giving comments, the recipient receives a

thank-you note. After a brief delay, the main GUI window is automatically shown.

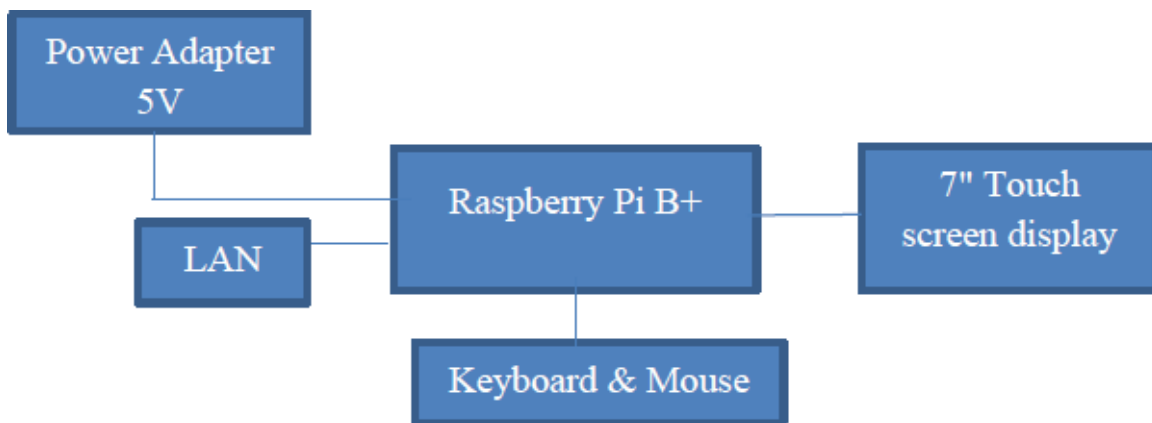


Fig.1 Block Diagram of Proposed System

IV. PERFORMANCE ANALYSIS

The developed system is simple to integrate into the current configuration. The entire hardware setup uses a relatively small amount of power. The technology used in this project is highly rational, straightforward, and reasonably priced. This device can be made much more durable and cost-effective by making it smaller and producing it on a big scale. It's straightforward and convenient to use this method. Anyone can install it to keep track of the food quality at restaurants, offices, schools, and other establishments. In the college lab, the designed demo hardware has been installed and tested.

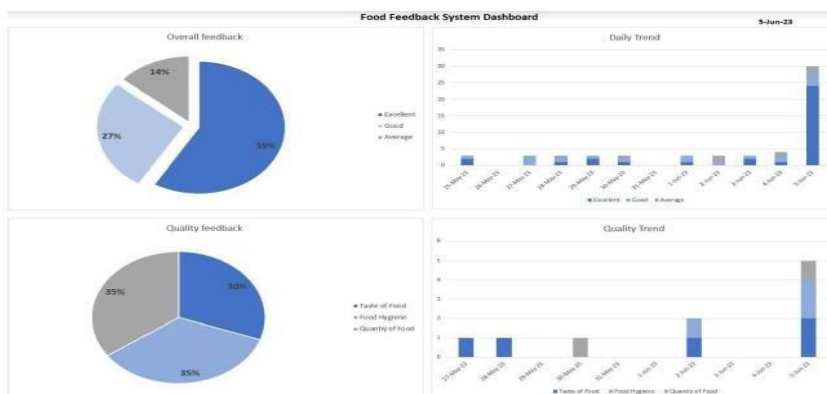


Fig. 2 Dashboard

The food feedback system's dashboard is depicted in Fig. 2. The pie chart shows quality and overall satisfaction in this case. On the left-hand side, the daily trend is also displayed for both quality and overall comments. Each block has a label connected to it, and the dashboard also lists



the labels. At the dashboard, we can easily keep track of user feedback and take necessary action. Daily feedback makes monitoring and analysis more effective. Comments are preserved in an Excel document that is kept on the Raspberry Pi itself. For a limited period of time, one may examine the excel sheet for the feedback on the quality of the food.

The sample feedback excel sheet in Fig. 3 can be manually created to track customer input on meal quality. The reasons for the average feedback can be addressed in the same way. Applications may be found in different eateries such hotels, restaurants, and canteens. There are several applications for this Project system.

Small Canteen Food Quality Feedback System			
Feedback	Excellent	Good	Average
Result	88	41	13
%	62%	29%	9%

Fig. 3 Sample feedback data

V. CONCLISIONS AND FUTURE SCOPE

The food feedback system consists of to achieve these goals, our feedback system is designed to improve and monitor food quality. People visit restaurants or canteens for the convenience of a great meal alone or to meet with friends and family. This allows them to make better business decisions, meet their constantly changing needs, and increase brand perception and brand loyalty.

The proposed method monitors the quality of the food by using multiple feedback and cutting-edge communication technology. The suggested systems can independently track or record different consumer feedbacks and the factors influencing the average feedback. This approach is an effective way to save people's health and money in light of the rising global food waste. Additionally, the suggested system can be modified slightly to fit the needs of many industries, including technical, commercial, consumer, retail, government, and industry. Consequently, the system is fully responsive to user needs, versatile, extensible, and cost-effective.

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