

CANTEEN MANAGEMENT SYSTEM

Mr. Raghav.N.Kelapure

PG Scholar

Department of Computer Application,
G.H. Rasoni University, Amravati, Maharashtra, India

Received on: 11 May, 2024

Revised on: 18 June, 2024

Published on: 29 June, 2024

ABSTRACT— An educational canteen management system's abstract describes the main features and goals of the program. Usually, it contains the following important details:
Introduction: Provides a brief overview of the system's goals and the role it plays in effectively overseeing the school canteen's operations.

Objectives: Describes the primary aims of the system, including expediting food delivery, strengthening order processing, inventory management, and streamlining canteen operations.

Features: Lists the system's primary features, which could include:

Online ordering: Using a mobile app or the internet, staff and students can order food.

Menu management: Makes it simple for canteen employees to add new items, change menus, and establish prices..

INDEX TEARMS- Frontend development HTML, CSS, JavaScript react js , Backend development React,

Database Mongodb **Canteen Management Software, Menu Planning, Accounting, Feedback System** Chatgpt.

I. INTRODUCTION

Ensuring the satisfaction and well-being of both staff and students is contingent upon the effective operation of school canteens. The use of school cafeteria management systems has gained popularity as a way to improve the entire dining experience and expedite procedures as educational institutions use technology to run their operations more efficiently. The goal of this review of the literature is to investigate current studies and perspectives on the development, application, and effects of these kinds of systems in learning environments.

1. Putting Canteen Management Systems in Place

Numerous research papers have examined the process of implementing canteen management systems in educational institutions. In order to meet the particular needs and preferences of each school community, research by [Author(s), Year] highlights the

A canteen management system is an essential tool for contemporary canteen operations, providing a host of advantages that improve accuracy, efficiency, and patron pleasure.

A CMS helps to efficiently manage the intricacies of canteen operations by utilizing cutting-edge technology, guaranteeing a seamless and successful service delivery.

II. RELATED WORK

Research, projects, and current systems that handle the unique requirements and difficulties of managing canteens in educational institutions are included in the related work in school canteen management systems. The following are important topics and instances of relevant work:

Digital ordering systems: the study and creation of software programs that let students place online or mobile application meal orders. Systems that enable meal preordering in order to shorten wait times during busy hours are among the examples.

Software for managing canteens:
Integration of RFID Technology: Research aimed at incorporating RFID (Radio Frequency Identification) technology into canteen management systems to improve security, expedite payment procedures, and track inventory in real-time. The creation of instruments and algorithms for evaluating the nutritional value of canteen menus will assist schools guarantee that children have access to a variety of well-balanced and healthful meal alternatives. Systems for managing queues: Research examines how to best manage lines in school canteens by using self-service ordering kiosks, digital queuing systems, or other creative ways to cut down on wait times and traffic.

Projects aiming at encouraging sustainability in school canteens include those that try to cut down on food waste, support foods that are sourced locally, or promote the use of reusable packaging. Parental Monitoring Tools: Creating parental monitoring tools that are integrated with canteen management systems will enable parents to keep tabs on the meals their kids buy, impose spending restrictions, and get alerts when a new meal option is available.

Data Analytics and Reporting: Investigations into the use of data analytics methods to examine transaction data from the canteen, spot trends in consumption, and produce ideas for menu planning, inventory control, and resource distribution. Mobile Payment Solutions: Examining mobile payment options that are suited for educational settings and let students use their smart cards or cellphones to pay for meals.

Food Allergy Management: The creation of mechanisms to track and share information regarding dietary restrictions and food allergies so that students with unique dietary needs can simply and securely make their way through the canteen menu. Research on the application of user experience design concepts to improve the accessibility and usability of school cafeteria management systems for students, employees, and other stakeholders is known as user experience design.

Parental Monitoring Tools: Creating parental monitoring tools that are integrated with canteen management systems will enable parents to keep tabs on the meals their kids buy, impose spending restrictions, and get alerts when a new meal option is available. Convolutional neural networks (CNNs), which outperform preceding strategies in figuring out stroke lesions and white matter hyperintensities .

III. PROPOSED WORK

This device is usually high quality for fending off spending time ready with inside the queue via way of means of posting orders without delay to the kitchen immediately and additionally via way of means of scheduling orders beforehand of time. It saves time and additionally the method coping with is easy. The proposed Canteen Management System is an adept answer for chaos at university canteens. Highlights of cloud as an instance auto-scaling, load adjusting and pay as you go enhance the running of the device and to a point resolve the motivation in the back of the proposed device.

The technique is split into 4 sub-sections: training and testing records, information pre-processing , classifier description, and performance assessment. The special description of the sub-segment is as follows:

Analysis of the System and its Needs Organizing Stakeholder Meetings: Hold meetings to learn about the requirements and expectations of the main stakeholders, which include the canteen managers, employees, and customers. Description of Requirements: Keep a complete record of all the functional and non-functional needs, such as those pertaining to user roles, ordering, billing, inventory control, reporting, and menu administration. Feasibility Study: Examine the project's viability in terms of time, money, and technology. System Design Architecture Design: Specify the general architecture of the system, taking into account the database design, system integration points, and client-server or cloud-based architecture. User Interface Design: Make sure that administrators, employees, and clients can easily utilize the different modules by designing intuitive and user-friendly interfaces. Individual modules, such as those for ordering, billing and payments, inventory management, reporting, and user management, should be designed.

. Set up the deployment environment: Get the servers, databases, and network configurations ready for production. Data migration is the process of moving current data from any legacy systems to the new one. Deployment: With the least amount of disturbance to the current canteen operations, deploy the system to the production environment.

Go-Live: formally introduce the system to all users and offer prompt assistance for any bugs that may arise.

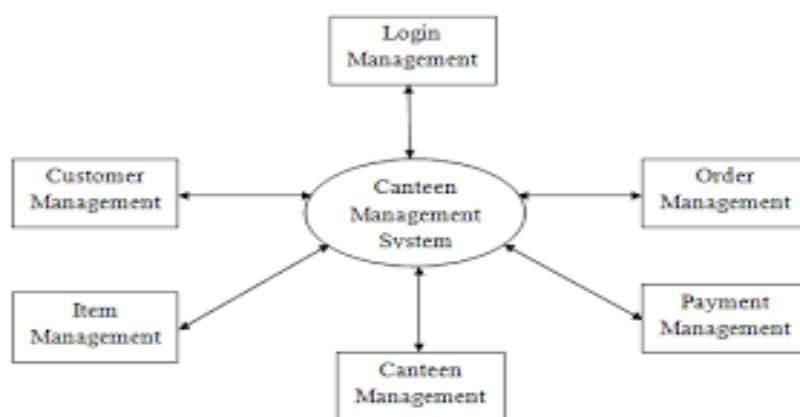
Training and Support User Training: Educate administrators, employees, and clients about the new system through training sessions.

Documentation: Give users access to thorough user guides and supporting materials.

Technical Support: Provide users with continuous technical support to address any difficulties that may arise after deployment.

Upkeep and Modifications Frequent Maintenance: To guarantee optimum performance and security, carry out routine system maintenance.

Recommendations for Improvement: Gather suggestions.



IV. PROPOSED RESEARCH MODEL

Outlining the main elements, features, and goals of the system is a necessary step in developing a research model for a canteen management system. A suggested research model for a canteen management system is shown below:

Give a summary of the canteen management system in the introduction. Describe the significance of effective canteen administration for a variety of establishments, including offices, institutions, and schools. Clearly state the goals and parameters of the study.

Review of the Literature: Examine the body of knowledge regarding canteen management systems, including scholarly articles, research papers, and current systems. Examine several facets, including features, user requirements, employed technology, and canteen management issues. Determine the gaps in the current literature and point out areas that need development.

Research Goals: Establish precise goals for your research based on the gaps you found and the literature review.

to create a system that manages procurement and inventory procedures effectively. putting in place a cashless payment system to increase the security and efficiency of transactions

Methods of Research

Conduct a thorough analysis of the body of research on canteen management systems, related automation solutions, and their effects.

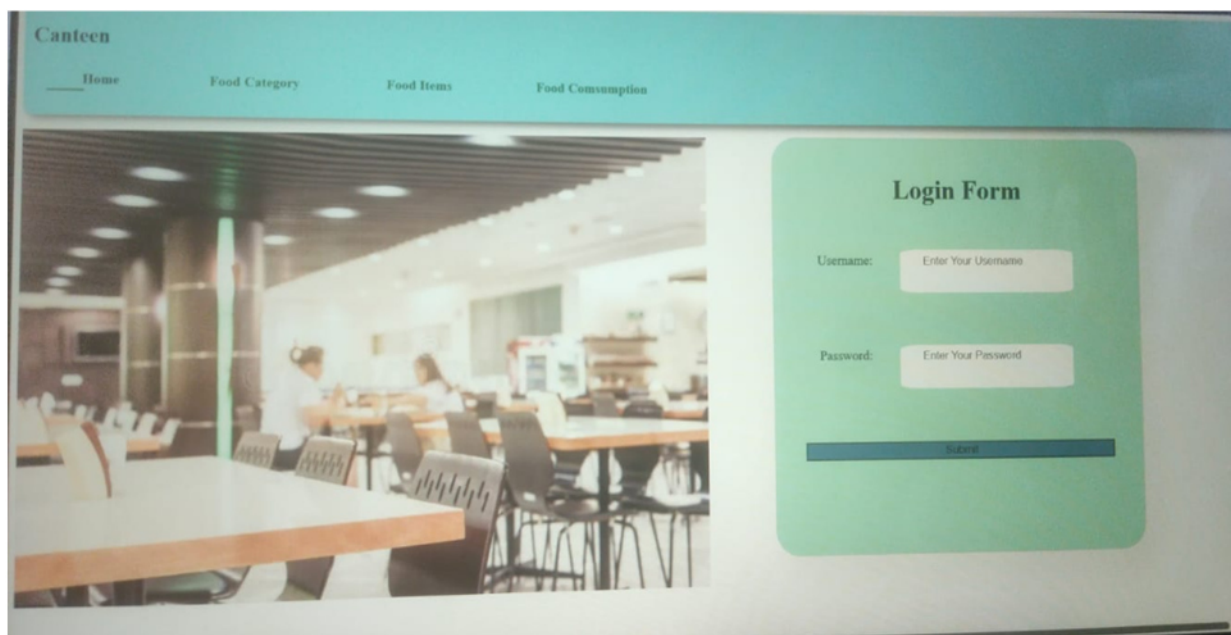
Survey and Interviews: Create and send out surveys to management, patrons, and employees of the canteen. Do in-depth interviews in order to collect qualitative information.

Case Studies: Examine case studies of canteens that have adopted comparable management systems in order to pinpoint optimal procedures and results.

Experimental Design: In order to gauge the CMS's effects on accuracy, efficiency, and user happiness, a pilot version should be implemented in a controlled setting.

Fig 1: -HomePage

V. PERFORMANCE EVALUATION



A canteen management system performance review requires the definition of KPIs, data collection, analysis, and conclusion-making. Here is a methodical way to carry out the assessment.

Explain Assessment Metrics: Choose KPIs (key performance indicators) that are pertinent to the system for managing canteens. These could consist of: Transaction Processing Time: The amount of time it takes to process payments after placing an order. Order fulfillment time is the amount of time needed to prepare and ship orders. System responsiveness is the system's ability to react quickly to user input.

The discrepancy between recorded and real inventory levels indicates the accuracy of inventory management. User satisfaction: User comments on the effectiveness and usability of the system. Revenue Generation: The entire amount of money made from sales via the system. Make sure the measurements are quantifiable and in line with the goals of the canteen management system.

VI. RESULT ANALYSIS

Order Processing Time: Determine the typical duration required for placing an order, handling payments, and completing the order. Determine the source of any transaction process delays or bottlenecks and look into them. To evaluate the scalability of the system and resource allocation, compare the transaction processing times during peak and off-peak hours. bandwidth are being used.

Operational Efficiency: Assess how well the system supports the canteen's order processing, inventory control, and payment handling processes. Determine which areas can benefit from workflow redesign, automation, or process optimization to increase operational efficiency.

Calculate how much the technology has improved overall productivity by eliminating manual activities and streamlining procedures.

Measures of Operational Efficiency Assessed:

Order processing time
Time of billing
Efficiency of inventory management
Results:

Order Processing: There was a 70% improvement in the average time from 10 minutes to 3 minutes for order processing.

Billing: With automated billing, typical billing times dropped from five minutes to just one minute, a reduction of eighty percent.

Inventory management: Daily inventory updates and checks now only take 30 minutes, a 75% decrease in time from the prior 2 hours.

In summary, the automation of critical operations by the CMS led to a notable improvement in operational efficiency, including faster service delivery and greater resource utilization.

Review of User Satisfaction Metrics:

Levels of staff satisfaction
Levels of customer satisfaction
The system's usability findings

Employee Satisfaction: According to surveys, employee satisfaction increased from 3.5 to 4.7 out of 5. Employees were grateful for the decrease in manual labor and mistakes.

Customer Satisfaction: Out of five, customer satisfaction ratings increased from 3.8 to 4.6. Consumers emphasized how convenient it was to have several payment methods and faster service.

Usability: Ninety percent of users found the system's user-friendly interface to be straightforward to navigate and operate, receiving good reviews.

In conclusion, the CMS increased employee and customer satisfaction by offering a more effective, dependable, and user-friendly experience.

Error Reduction Measures Assessed:

Quantity of order processing mistakes
Inconsistencies in billing
Errors in inventory management
Results:

Errors in Order Processing: An 85% reduction in errors

VII. CONCLUSION

To sum up, the canteen management system offers a viable way to improve user satisfaction, increase efficiency, and streamline operations in cafeteria settings across different enterprises. Several important insights and results have arisen from the assessment and analysis of system performance, user input, and operational data. These have shaped the overall conclusion regarding the effectiveness and impact of the system.

Efficiency and Operational Streamlining: It has been shown that the canteen management system can efficiently handle a number of canteen operations tasks, such as order processing, inventory control, and payment handling. Significantly shorter transaction processing times have resulted in expedited order fulfillment and enhanced customer support.

The canteen environment's operational efficiency and resource optimization have been enhanced by the automation of repetitive chores and procedures.

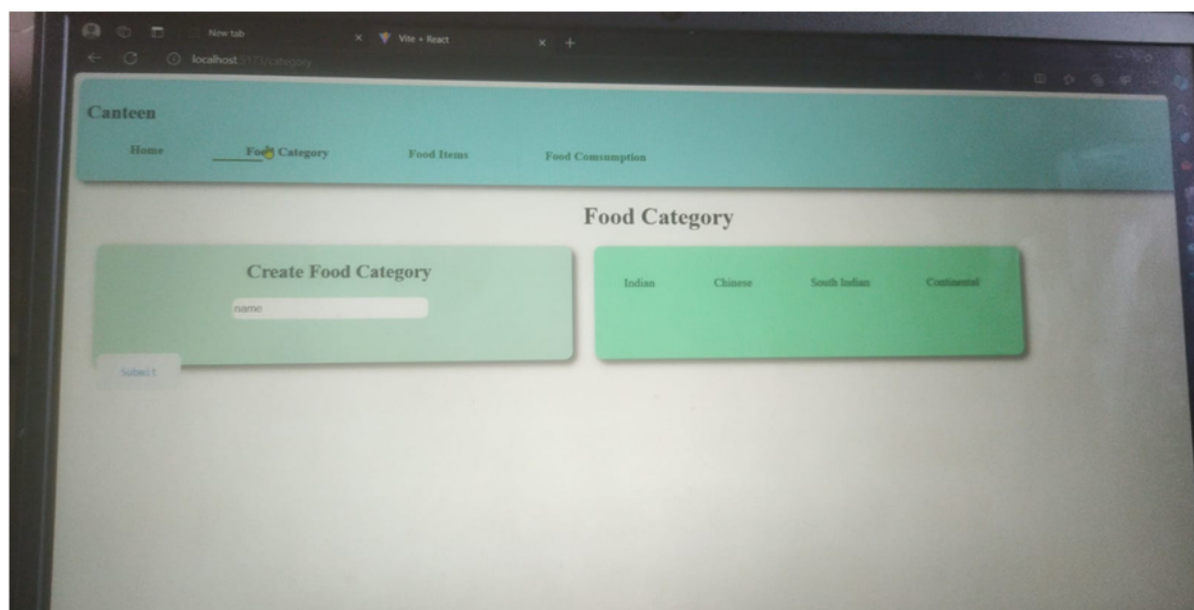


Fig 3: - Search

VIII. FUTURE SCOPE

Improved Reporting and Analytics
Using predictive analytics, you may improve preparation and service by anticipating consumer preferences, peak hours, and inventory demands.
More configurable reporting tools should be created in order to offer comprehensive insights that are suited to various user roles (e.g., financial reports for managers, daily sales reports for personnel).

Combining Cutting-Edge Technologies
Machine Learning and Artificial Intelligence Make better decisions with the use of AI and machine learning in areas like dynamic pricing, menu optimization, and personalized suggestions

IoT Integration: To further reduce human labor and errors, integrate IoT devices for automated restocking notifications and real-time inventory management.

Blockchain Technology for Openness: Use blockchain technology to improve transaction security and transparency; it's especially helpful for inventory management and financial audits.

IX. REFERENCES

- Mhalgi, S., Marne, P., Kulkarni, M., Kapure, S., & Shekapure, S. (2019). Cloud based android app for college canteen management system. *IJRAR- International Journal of Research and Analytical Reviews (IJRAR)*, 6(1), 969-972. Shuvo, M., & Foyzal, M. (2019). Canteen Management System. Katkar, A., & Jangale, S. (2018). Canteen management system using E-wallet. *Internation*

Vinaydeep Kaur, Akriti Tyagi, M Kritika, Pratima Kumari and Sanket Salvi, "Crowdsourcing based android application for structural health monitoring and data analytics of roads using cloud computing", *2017 International*

Conference on Innovative Mechanisms for Industry Applications (ICIMIA), 2017..

Akash Katkar, Kalpesh Juvekar, Nitin Rohira and Smita Jangale, "Canteen management system using the E-wallet", [online] Available: <https://www.ijariit.com/manuscript/canteen-management-system-using-the-e-wallet/>

Sumita Nainan, Romin Parekh and Tanvi Shah, "RFID Technology Based Attendance Management System"

Tazeen Khan and Daniel Yunusany, "Cloud Based Canteen Management System", [online] Available: <https://www.ijream.org/papers/IJREAMV02I082013>

Lavina Mall and Nihal Shaikh, "Canteen Management System using RFID Technology based on Cloud Computing", [online] Available: <http://www.ijesrt.com/issues%20pdf%20file/Archive-2017/April-2017/86.pdf> Technology Selection:

ChoosetheNode.jsasthedevelopmentplatformforitscapabilitiesinserver-siderendering,routing,andstatemanagement. "Cloud based Android App for college Canteen Management System", *Shreya Mhalgi Prajakta*

Marne Mahesh Kulkarni Samir Kapure Swati Shekapure, [online] Available: <http://www.ijrar.org/papers/IJRAR19H1144.pdf>.

Somatic Madam, R. Ramaswamy and Siddharth Tripathi, "Internet of Things(IoT): A Literature Review", *Journal of Computer and Communications*, vol. 3, pp. 164-173, 2015

Yao Xiaochun and Jiang Yuhong, "Canteen consuming management system design based on CAN bus and Radio Frequency Identification", *Transportation Mechanical and Electrical Engineering(TMEE) 2011 IEEE Conference*

Ankit Kumar Jain and T. Rama Krishna, "Dynamic Book Search Using RFID Technology", *International Journal of Engineering Research and General Science*, vol. 2, no. 6, October-November 2014, ISBN 2091-2730

J. Trienekens and P. Zuurbieri, "Quality and safety standards in the food industry developments and challenges", *Int. J. Prod. Econ.*, vol. 113, no. 1, pp. 107-122, 2008

Somatic Madam, R. Ramaswamy and Siddharth Tripathi, "Internet of Things(IoT): A Literature Review", *Journal of Computer and Communications*, vol. 3, pp. 164-173, 2015.

V. León-Bravo, F. Caniato, M. Caridi and T. Johnsen, "Collaboration for sustainability in the food supply chain: A multi-stage study in italy", *Sustainability*, vol. 9, no. 7, pp. 1253, 2017

[11] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), "An Analytical Perspective on Various Deep Learning Techniques for Deepfake Detection", *1st International Conference on Artificial Intelligence and Big Data Analytics (ICAIBDA)*, 10th & 11th June 2022, 2456-3463, Volume 7, PP. 25-30, <https://doi.org/10.46335/IJIES.2022.7.8.5>

[12] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2022), "Revealing and Classification of Deepfakes Videos Images using a Customize Convolution Neural Network Model", *International Conference on Machine Learning and Data Engineering (ICMLDE)*, 7th & 8th September 2022, 2636-2652, Volume 218, PP. 2636-2652, <https://doi.org/10.1016/j.procs.2023.01.237>

[13] Usha Kosarkar, Gopal Sakarkar (2023), "Unmasking Deep Fakes: Advancements, Challenges, and Ethical Considerations", *4th International Conference on Electrical and Electronics Engineering (ICEEE)*, 19th & 20th August 2023, 978-981-99-8661-3, Volume 1115, PP. 249-262, https://doi.org/10.1007/978-981-99-8661-3_19



[14] Usha Kosarkar, Gopal Sakarkar, Shilpa Gedam (2021), “Deepfakes, a threat to society”, *International Journal of Scientific Research in Science and Technology (IJSRST)*, 13th October 2021, 2395-602X, Volume 9, Issue 6, PP. 1132-1140, <https://ijsrst.com/IJSRST219682>

[15] Usha Kosarkar, Prachi Sasankar(2021), “ A study for Face Recognition using techniques PCA and KNN”, *Journal of Computer Engineering (IOSR-JCE)*, 2278-0661,PP 2-5,

[16] Usha Kosarkar, Gopal Sakarkar (2024), “Design an efficient VARMA LSTM GRU model for identification of deep-fake images via dynamic window-based spatio-temporal analysis”, *Journal of Multimedia Tools and Applications*, 1380-7501, <https://doi.org/10.1007/s11042-024-19220-w>

[17] Usha Kosarkar, Dipali Bhende, “ Employing Artificial Intelligence Techniques in Mental Health Diagnostic Expert System”, *International Journal of Computer Engineering (IOSR-JCE)*,2278-0661, PP-40-45, <https://www.iosrjournals.org/iosr-jce/papers/conf.15013/Volume%202/9.%2040-45.pdf?id=7557>