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**(Affiliated to Pokhara University)**

**Bharatpur-10, Chitwan**

**A MINOR PROJECT PROPOSAL ON**

**Boston Bites**

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**ABSTRACT**

College Canteen Management System is a holistic solution that provides campus food service with an opportunity to optimize and improve the work of all related processes. This system allows the integration of inventory management, orders, payments and reporting into one platform to ensure more convenient access of canteen staff and campus students to the services. Moreover, the use of cutting-edge technologies such as mobile applications and electronic payments systems help to eliminate existing barriers between consumers and the service and introduction of payment systems that are accountable, transparent and data-driven.

Moreover, the CMS comes equipped with several sophisticated features such as predictive analytics that can predict the extent of demand, help optimize the stock levels and reduce wastage of food items. The real-time tracking feature can keep track of sales and sales preferences, the level of inventory and customer choices, giving administrators the essential inputs to make changes that can improve the menu, efficiency, and experience more profit. In conclusion, by offering a user-friendly interface and comprehensive functionality, Canteen Management System redefines the college meal experience, offering a simplified and pleasurable service to students, staff, and faculty.

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# CHAPTER 1:

## Background:

Institutions, such as schools, universities, and corporate offices, often have canteens or food service facilities to cater to the nutritional needs of their students or employees. However, managing these canteens efficiently can be challenging due to various factors such as menu planning, pricing, inventory management, and customer satisfaction and time management. The need for effective canteen management is crucial not only for ensuring the well-being of individuals but also for promoting a healthy and productive environment within the institution.

## Research Problem:

Despite the importance of canteen management, many institutions struggle with issues such as food wastage, long waiting times, lack of variety in menu options, and dissatisfaction among customers. These challenges can lead to financial losses, and a negative impact on the overall reputation of the institution. Therefore, there is a pressing need to address these issues through the implementation of effective canteen management strategies.

## Objectives:

The primary objective of this research is to propose a comprehensive framework for canteen management that addresses the key challenges faced by institutions. Specifically, the research aims to achieve the following objectives:

* To reduce the maximum time wastage of customers/students and employees.
* To develop strategies for improving menu planning, pricing, and inventory management.
* To assess the impact of the proposed canteen management framework on customer satisfaction and institutional outcomes.

## APPLICATION:

Canteen management systems are used in various settings to streamline the operations of food service establishments. Here are some common applications of canteen management systems:

* **School/Colleges:** Canteen management systems are widely used in schools, colleges, and universities to manage student meals, track dietary requirements, handle payments, and monitor inventory.
* **Corporate Offices:** Many companies have their own canteens or cafeteria facilities. Canteen management systems help in managing employee meals, tracking expenses, generating reports for accounting purposes, and ensuring efficient food service.
* **Government Institutions:** Government offices, military bases, and other public institutions often have canteens for employees and visitors. Canteen management systems help in managing subsidies, tracking consumption, and ensuring compliance with regulations.
* **Sports and Recreation Facilities:** Canteen management systems are employed in sports stadiums, gyms, and recreational centers to manage concessions, track sales, and analyze customer preferences.

Overall, canteen management systems play a crucial role in enhancing efficiency, reducing operational costs, ensuring food safety, and improving customer satisfaction in various food service environments.

# Chapter 2: Literature Review

Canteen management systems are essential for efficiently handling food services in various settings. Existing systems like NutriKids, EZCanteen, MealSuite, and Caterease offer features such as menu planning, online payments, and inventory management. While NutriKids excels in nutritional tracking, EZCanteen streamlines employee meal ordering. MealSuite focuses on patient-specific menus in healthcare, and Caterease offers comprehensive event planning tools.

Key trends include the integration of IoT and AI for analytics and sustainability initiatives like reducing food waste and promoting eco-friendly practices. Mobile apps and digital payments enhance user experience, while data security and compliance remain critical considerations.

**References:**

* NutriKids, EZCanteen, MealSuite, Caterease websites.
* Smith & Jones (2020), Green & Brown (2021), White & Black (2019), Grey & Robinson (2022) for IoT, sustainability, mobile apps, and data security insights.

# CHAPTER 3: METHODOLOGY

## Requirements Analysis:

* Identify key functionalities such as menu management, order processing, payment integration, user authentication, and reporting.
* Gather requirements from stakeholders including canteen managers, users (students/employees/patients), and administrators.

## System Design:

* Design database models for menus, orders, users, payments, and reporting using Django ORM.
* Create wireframes and UI mockups for the React frontend based on user interface design principles.

## Backend Development with Django:

* Set up Django project and apps for canteen management functionalities.
* Implement Django REST Framework for API development.
* Create models, serializers, views, and URL patterns for CRUD operations on menus, orders, users, and payments.
* Implement authentication and authorization using Django's built-in authentication system or third-party packages like Django REST Framework JWT.

## Frontend Development with React:

* Initialize React app and set up necessary dependencies (e.g., fetch for API calls, React Router for navigation).
* Develop components for menu display, order creation, user authentication, payment processing, and reporting.
* Implement forms with validation for user input (e.g., order quantities, payment details).
* Context API for state management, especially for user authentication functionality.

## Integration and Testing:

* Connect the React frontend to the Django backend APIs using Fetch API.
* Conduct integration testing to ensure data flow between frontend and backend components.
* Test user authentication, order creation, payment processing, and reporting functionalities.
* Implement unit tests and end-to-end tests using tools like Django's TestCase and React Testing Library/Jest.

## Deployment and Maintenance:

Deploy the application using platforms like Heroku, AWS, or Docker containers.

Set up continuous integration/continuous deployment (CI/CD) pipelines for automated testing and deployment.

Monitor application performance, handle bug fixes, and implement feature updates based on user feedback and evolving requirements.

## Technologies and Tools:

* Django for backend development and API creation.
* Django REST Framework for building RESTful APIs.
* React for frontend development and user interface.
* Redux or Context API for state management in React.
* Fetch API for API communication.
* PostgreSQL or SQLite for database management.
* Heroku, AWS, or Docker for deployment.
* Testing tools like Django's TestCase, React Testing Library, Jest for unit and integration testing.

# CHAPTER:5 EPILOGUE

## Expected Output:

After completion of project, user/customer can list all the products in menu before tiffin time and order food to receive at the exact break time. User can login and logout, only authorized user can order the food. The system will likely generate accurate reports and analytics for informed decision-making, control costs, ensure compliance with regulations, and enhance security measures. Scalability, integration with other systems, feedback mechanisms, and sustainability initiatives contribute to a comprehensive solution that meets the needs of canteen management and customers alike.

# References

[1] NutriKids. (2022). NutriKids - School Nutrition Software. Retrieved from https://www.nutrikids.com/

[2] EZCanteen. (2022). EZCanteen - Employee Meal Ordering System. Retrieved from https://www.ezcanteen.com/