GitGrub

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1 Statement of the Project (Product)

1.1 Statement of the project Product

A robust and well-organized web application, **GitGrub** is **a canteen management system** is intended to improve and expedite the cafeteria or canteen's operations of a department or university or any educational institute. We aim to build it with educational or corporate settings in mind, effectively handles a number of canteen functions, such as order processing, customer interactions, inventory tracking, employee management, and feedback gathering. The application offers a complete solution for managing inventory levels, tracking orders, handling a variety of food items, tracking schedules, and supervising the roles and schedules of canteen employees. It’s optimized database ensures data integrity. **GitGrub** strives to maximize accuracy, efficiency, and customer satisfaction in a canteen facility's daily operations through a methodical approach.

1.2 Justification

This project is justified by the increasing need for digitization and automation in canteen operations. Manual systems are prone to errors, inefficiencies, and difficulties in maintaining accurate records. GitGrub addresses these issues, improving overall operational efficiency and customer satisfaction. Quantitatively, it is expected to reduce order processing time by 30%, minimize errors by 20%, and increase revenue by 15% within the first year. Also with the boom of AI in the current world, this project aims to use artificial intelligence providing the staff and users with a whole different experience.

1.3 Objectives and Goals

Short-term objectives:

Customer Registration:

- Allows new customers to register with unique IDs.
- Captures customer details, including name, email, phone, and role (e.g., student, faculty).

MenuManagement:

- Facilitates the addition, removal, and update of items in the canteen menu.
- Categorizes menu items into breakfast, lunch, snacks, and beverages.

Order Processing:

- Enables customers to place orders seamlessly.
- Tracks order status, order date, and calculates the total amount for each order.

Employee Management:

- Administers employee details, including name, email, phone, hire date, and address.
- Differentiates roles among employees (chef, waiter, cleaner).
- Specialization (for chefs), station (for waiters), and cleaning area (for cleaners) are managed.

Long-term goals:

Inventory Control:

- Manages stock levels to ensure the availability of items.
- Provides insights into the quantity of each item in the inventory. Inventory management tracks stock levels and reduces wastage.

Feedback System:

- Gathers customer feedback to assess satisfaction levels.
- Records ratings and comments associated with specific orders.

Financial Transactions:

- Manages employee salary transactions, recording amounts and dates.

Annual Optimization:

- It is expected to reduce order processing time by 30%, minimize errors by 20%, and increase revenue by 15% within the first year.

Shift Scheduling:

- Organizes work shifts for employees.
- Ensures proper coverage during different time slots.

1.4 Achievement and Benefits

The successful implementation of GitGrub will result in a range of achievements and benefits, contributing to the overall improvement of canteen operations and customer satisfaction.

Streamlined Operations:
The web app will streamline various canteen processes, such as online/offline order processing, pre-orders, inventory management, and employee scheduling. This efficiency will lead to a reduction in processing time, minimizing delays and enhancing overall service.

Enhanced Customer Experience:
A user-friendly interface for customers, coupled with features like seamless order processing and a categorized menu, will significantly improve the overall customer experience. Customers can easily place orders, track them, and enjoy a more convenient and satisfying interaction with the canteen.

Efficient Inventory Control:
The inventory control system will contribute to better stock management, ensuring that the canteen maintains adequate levels of ingredients and items. This prevents shortages, reduces waste, and allows for a more varied and available menu.

Optimized Employee Management:
Employee details and roles, including specialization for chefs, assigned stations for waiters, and specific cleaning areas for cleaners, will be efficiently managed. This optimization leads to a well-organized and productive workforce.

Feedback-Driven Improvement:
The feedback system will collect customer opinions, ratings, and comments, enabling the canteen to understand customer preferences and areas for improvement. Continuous analysis of feedback will drive adjustments in menu offerings and services.

Financial Transaction Accuracy:
The system for managing financial transactions, including employee salary records, will ensure accuracy and transparency in financial operations. This contributes to reliable financial reporting and efficient budgeting.

Effective Shift Scheduling:
The shift scheduling feature will organize work shifts for employees, ensuring proper coverage during different time slots. This results in a well-managed staff, minimizing operational gaps and improving overall efficiency.

Market Competitiveness:
GitGrub's comprehensive features and efficient operations will position it competitively in the market. It will set a standard for one stop canteen management solutions, attracting more institutions and users.

Business Growth and Increased Revenue:
The combined benefits of streamlined operations, enhanced customer experience, and efficient management contribute to business growth. Satisfied customers and optimized processes can attract new business, leading to potential revenue increases for canteen operations.

2 Project Background

2.1 Technical background

Preferred tools for the project:

- Language: Python
- Framework: Django/Flask
- HTML
- CSS
- Database: PostgreSQL/MongoDB
- Useful APIs for specific purposes.

2.2 Commercial Background

GitGrub, specifically designed for universities in Bangladesh, holds significant potential for financial benefits. The commercial background of the project revolves around the value it adds to canteen operations within educational institutions, contributing to both cost savings and revenue generation. Many of the universities

do not have canteens due to the lack of management system. GitGrub can be a kick-start to their canteen journey.

Cost Savings through Efficiency:
The web app's streamlined operations, including order processing, inventory control, and employee management, lead to increased operational efficiency. This, in turn, translates to cost savings for university canteens by minimizing resource wastage, reducing processing time, and optimizing staff utilization.

Reduced Administrative Burden:
The automated features of the app, such as financial transaction management and shift scheduling, alleviate the administrative burden on canteen staff and university administrators. This reduction in administrative workload allows staff to focus on core tasks, improving overall productivity.

Improved Financial Transparency:
The financial transaction management module ensures accurate recording of employee salaries and transparent financial reporting. This transparency not only instills confidence in university administrators but also facilitates effective budgeting and financial planning.

Increased Revenue Opportunities:
The enhanced customer experience provided by the web app, with features like menu categorization, seamless order processing, and personalized feedback, contributes to increased customer satisfaction. Satisfied customers are more likely to be repeat customers, leading to increased sales and revenue for university canteens.

Attraction of Partnerships:
The modern and technologically advanced nature GitGrub makes it an attractive proposition for potential partnerships. Collaborations with food suppliers, payment gateways, or other relevant stakeholders could bring additional revenue streams for the canteen operations.

Market Competitiveness:
A university with a well-managed and technologically advanced canteen is likely to attract more students and staff. GitGrub positions the university as forward-thinking and focused on providing the best possible services, contributing to its competitive edge in the market.

Demonstrable ROI for Institutions:
The cost-effectiveness and financial benefits of the web app can be showcased to institutions, emphasizing the return on investment (ROI). This makes the app an attractive solution for universities looking to modernize their canteen operations while ensuring a positive impact on their bottom line.

Market Expansion and Licensing Opportunities:
As the app proves its success within a university, there is potential for market expansion to other educational institutions in Bangladesh. Licensing the Canteen Management Web App to multiple universities can generate substantial revenue through scalable implementation.

2.3 Scientific background

To develop such a web-based canteen platform, knowledge on information science, food science and of course, computer science is required. Information science is the study of how information is created, organized, stored, retrieved, and used. To keep a healthy balance diet for the students, basic knowledge on food science is necessary. For building up the whole system in an efficient and friendly way, technological knowledge from software, development and database are needed. In addition, as the platform uses AI in some cases, familiarity with Machine Learning is demanded.

3 Project (Product) description

3.1 Product perspective

Customers:
Customers seek a convenient and user-friendly platform for placing orders, tracking order status, and providing feedback. An intuitive interface, categorized menu, personalized recommendations, and a seamless ordering process that enhances their overall dining experience.

Canteen Staff:
Canteen staff require a system that simplifies order processing, inventory management, and employee scheduling. Streamlined workflows, real-time order tracking, efficient inventory control, and employee management to minimize manual tasks and errors.

Administrators:
University administrators aim for an integrated system that provides insights into canteen operations and facilitates data-driven decision-making. Comprehensive reporting tools, financial transparency, and the ability to monitor and optimize overall canteen performance. The system should aid in resource allocation and budget planning.

University Management:
University management seeks a solution that aligns with the institution's overall technological standards and enhances the overall campus experience. Technological innovation, scalability, and a positive impact on the university's image. The system should contribute to the well-being and satisfaction of students and staff.

3.2 General capabilities

- **Web Development in Python:** Expertise in web development using Python as the primary programming language. Python's versatility and readability make it suitable for efficient and scalable web application development.
- **Framework Proficiency:** Proficiency in utilizing either Django or Flask as the web application framework.
- **Front-End Development:** Strong skills in HTML and CSS for building the user interface.
- **Database Management:** Expertise in working with either PostgreSQL or MongoDB for data storage and retrieval.
- **API Integration Skills:** Proficiency in integrating relevant APIs for specific functionalities, such as external data sources.

- **Data Analytics Skills:** Familiarity with data analytics tools and methods for processing and analyzing customer behavior, order patterns, and feedback.
- **Machine Learning:** To build artificially intelligent assistant which helps both the staffs and the customers.

3.3 General constraint

The constraints we will need to be aware of are:

- Time Constraint
- Budget Constraint
- Skill Set of the Team
- Unforeseen Technical Challenges
- Changing Requirements
- Integration Complexity
- Security Concerns
- Documentation Challenges

3.4 User Characteristics

Canteen Staff: Will use the app for order processing, inventory management, and reporting.

Administrators: Will oversee the whole canteen, access analytics, and manage user accounts.

Customers: Will use the app to browse menus, place orders online and offline, and provide feedback. Customers will include students, teachers and staff of a department/university.

3.5 Operational Environment

GitGrub will be deployed in educational institutions, adapting to the unique operational environments of canteens within schools, colleges, and universities. The project will be accessible through a web application. The project will be continuously updated and maintained to ensure that it meets the changing needs of the staff and customers.

4 Innovation and Entrepreneurship

4.1 Innovation requirement

Personalized Recommendation: The project aims to personalize the ordering experience for customers based on their search history and preferences. This will include providing personalized food recommendations and customized booking pages based on customer preferences.

AI Assistant: We aim to create an AI assistant that will help the staff to predict the quantity of items required in the whole day. Preferences of implementation may change in the future.

4.2 Entrepreneurship requirement

The development and deployment of the Canteen Management Web App may require entrepreneurship support to ensure successful implementation, sustainability, and market penetration.

- Funding for Development and Marketing
- Permission for the higher authority to use the project in a real canteen for testing
- Networking and Partnership Opportunities with different restaurants and food commercials
- Market Research and Competitive Analysis

5 Conclusion

The university canteen database is an extensive and well-organized system created to effectively manage the day-to-day activities of a university canteen. Tables for patrons, canteen supplies, orders, order items, comments, inventory, and staff (such as cooks, waiters, and cleaners) are all included. The database follows normalization principles, which include protecting data integrity, reducing redundancy, limiting access through views, utilizing indexes to query quickly when needed, and creating relationships between entities.

To sum up, the university canteen database is a reliable and flexible way to handle different parts of the canteen business, which helps to make the experience smooth and well-organized for both patrons and employees.