Evaluating the Impact of Quick-Eats on Student Experience and Canteen Operations at IOBM

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Abstract: **The Quick-Eats platform provides university canteens with a mobile and online solution tailored to their specific needs. This addresses the issues with traditional food ordering methods, which are exacerbated by busy class schedules. This study examines the use of Quick Eats at the Institute of Business Management (IoBM) and its potential to simplify food ordering, streamline operations, and reduce student stress. Quick-Eats is expected to enhance the academic environment by making it easier to select and purchase meals. This will improve the daily lives of IoBM students, reduce classroom delays, and increase vendor sales. This study examines the implementation of the Quick-Eats program and its anticipated benefits, with a focus on how it can improve students' lives**

Keywords: **food-ordering, React Native, mobile application**

INTRODUCTION

The importance of online meal-ordering apps in today's hectic society cannot be emphasized. These apps expedite the ordering procedure for food, eliminating the need for laborious paperwork and long wait times characteristic of conventional cafeteria systems. Long wait times for orders are being addressed using these cutting-edge technologies to increase user experience overall and operational efficiency.

The main goal of Quick Eats is to make ordering meals for university students easier. It offers features such as simple ordering, order updates via notifications, and student registration using their student IDs. By adding features like vendor ads, data analytics for well-informed decision-making, and food information to accommodate a range of dietary needs, it seeks to close gaps in the current manual ordering process. Cross-platform compatibility is another feature of the software that guarantees students can use it on any device. Furthermore, Quick-Eats uses a special system that lets students specify the time that they will pick up their meals from the cafeteria. This helps to keep the canteen running smoothly and lessens the stress that comes with standing in line for a long period. Quick-Eats wants to transform the on-campus meal ordering experience by fusing cutting-edge technology with an intuitive design, giving students convenience and efficiency.

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LITERATURE REVIEW

Ordering apps significantly reduce staffing requirements and wait times by using technology to handle multiple orders with a single click, increasing overall efficiency [2]. In addition, these applications cater to the growing demand for fast and efficient service by providing ease of use, including browsing menus, placing orders, and selecting pickup times.

At the Institute of Business Management (IOBM), the Quick-Eats application is specially made to address the problems. With React Native, this cutting-edge food application unifies the web and mobile platforms, delivering an adaptive and responsive user experience on all platforms. The Laravel PHP framework powers the application's backend, offering a stable and expandable structure for effectively managing the admin and vendor operations. The database is MongoDB, which provides a flexible and effective way to manage a wide range of changing needs for data. Quick-Eats is dependable and able to fulfill user demands because of this combination of technology. Quick-Eats makes life easy for students through

At present, the internet is transforming the physical world into digital, wireless networks. The canteen management procedure aims to improve organizational efficiency by automating the conventional manual procedure. M. Krishnan, in 2021, introduced the use of web-based software [3]and an RFID system. The Canteen Management System is available via the internet from any location. It provides error-free accounting, inexpensive development costs, and a safe, dependable, and efficient system management service.

In 2022, S. Masurkar [4]addresses challenges in traditional college canteen management, where manual processes and cash transactions lead to long queues, delays, and missed lectures. To tackle these issues, a mobile app-based canteen management system is proposed. Using a smartphone app, consumers may place orders in advance with this system, which also provides online payment choices and real-time

order tracking. Time

Savings, fewer mistakes, cheaper labor, better user experiences, and better customer-canteen worker communication are all promised.

In 2023, Tanmay Wakchaur [5] developed a mobile app called Eats that aims to change the way students eat on campus by solving important problems that students confront. The software directly addresses ongoing issues with campus food, including long wait times, limited payment options, slow order processing, and potential security risks during transactions. Eats provides students with an easy-to-use mobile interface that allows them to place orders, track their progress in real-time, utilize various digital payment methods, and check out quickly using a QR code. The app's all-around approach transforms the typical canteen experience into a seamless, customer-focused service.

In 2023, Priyanka proposed Dine Pass[6], which uses innovative concepts and technology to improve every aspect of entering a hostel's dining area. Instead of paper mess cards and lengthy inspections, Dine Pass employs RFID readers and IR sensors for authentication. RFID cards let students enter the mess hall without waiting. IR sensors activate a hand sanitizer dispenser at Dine Pass to speed up entrance and facilitate cleaning. Trust it to be clean. This study highlights system inefficiency by highlighting slow processes, infection risk, and poor record-keeping. We advocate a coordinated Dine Pass system to fix these issues. Hostel meals are enhanced through automated guest identification, efficient housekeeping, and accurate record-keeping. Dine Pass improves efficiency, hygiene, wait times, and statistics. However, students had improved access to meals, time management, and confidence in hygiene. This article discusses the merits of Dine Pass and how it could transform hostel meals.

Joseph George and Adi Shankara in 2020 [7] suggested a digitalized canteen operations system that would allow customers to make online payments, select menu items, register, and use a virtual line to skip large lines. Customer feedback can also be disseminated to enhance services. The system's objectives are to give clients the best possible service, facilitate improved time management, and simplify the canteen management procedure. In addition to selecting preferred items from a menu and making online payments, users can create an account. Online and counter-ordering are the two methods of placing orders supported by the suggested solution. Counter orders can be paid for with cash or online. However, online orders can only be paid for. The system tracks and updates the status of orders and sends messages to clients regarding their orders. It also includes features such as searching for food items, order cancellation within a specified time limit, and report generation for administrators. Thus, the "Canteen Food Ordering and Managing System" aims to digitize canteen operations, providing a more efficient and convenient experience for customers by notifying them when the order is ready.

Rather than using the traditional ordering system that is currently used extensively in the food and beverage industries, there is a fully computerized and mobile food ordering system that can adapt, as introduced by J. N. Hamid 2022 [8], to continuous developments in today's technological era. The majority of the food and beverage sectors often use a manual ordering system, which entails manual recording of all tasks and procedures along with copious amounts of unintelligible and compelling paperwork. Hence, the purpose of this computerized and mobile digital food ordering system is to facilitate everyday business operations and improve the administration of the business routine. MySQL database is used to store application databases

The study by Taylor (2020), recommended that every campus food service operation think about providing mobile applications for ordering food because they let students purchase meals whenever it's convenient for them and save time instead of having to wait in line. The four phases of the modified Waterfall Model—Requirement Analysis, Design, Implementation, and Testing—have been employed as the study's approach. The Software Development Life Cycle (SDLC) paradigm used to build the e-Runner prototype was the Modified Waterfall paradigm. It provides a structure for the tasks completed within the software development lifecycle. The

Usability Test has been used to assess this mobile application in order to find any issues and had to answer all questions.

M. Muhammad 2021 [9] concludes that food ordering software makes it simple and time-efficient for users to obtain their food. Underweight and overweight children are deemed malnourished in many underdeveloped nations, implying that they have not only not eaten enough food but also not enough nutrients. Therefore, this solution offers a second function in addition to the collaborative filtering technique. It will advise the user on a nutritious meal that the kids should eat based on the given parameters, such as foods that contain allergies. Many children, particularly those in primary schools, will benefit from this effort, as indicated by the 75% of respondents who felt that the system was helpful in making food selections quickly and in saving them time while getting food during breaks. Running a restaurant without an online presence is a squandered opportunity, as 75% of consumers choose their eating based on search results. A website gives the restaurant more control over its image, allowing it to convey its story and ambience to guests directly. It has a substantial impact on both internet visibility and search rankings. The integration of a booking widget simplifies reservations, providing simplicity

and efficient management while reducing overbooking. The existing system allows for digital meal ordering through an Android-based application, whereas the proposed system improves the consumer experience by preserving prior orders for easier reordering. It introduces a credit scoring system, which automatically updates scores for orders over Rs. 5000 and offers 23 credit-based discounts and coupons. This complete strategy improves client involvement, efficiency, and financial management.

H. Menewar (2023) [10] demonstrates how IoT and RFID technology may improve canteen and cafeteria management by automating operations and providing managers with more insight. Administrators can register and authenticate using their ID and password credentials. They can then view consumer information such as balances, email addresses, unique identification numbers, and order data. They also have the option to update or change customer information as needed. Users are advised of their balance and order details via SMS or email, and they can refill their balance. The use of IoT and RFID technologies in canteen management systems reduces paper waste, eliminates the need for extra people in bill counters, and makes it easier to manage old data for future use.

Comparison of Existing Systems with Proposed System

	Login	Food Information	Advertisement	Data Analytics
MOBILE SCHOOL CANTEEN	☐	☑	☐	☐
CANTEEN ORDERING SYSTEM	☑	☐	☐	☐
FOODTOPIA	☑	☐	☐	☐
SMART CANTEEN	☑	☐	☐	☑
e-RUNNER	☑	☐	☐	☐
Cafeteria Management System	☑	☐	☐	☐
Android based Canteen Management	☑	☑	☐	☑
FoodSMART	☑	☑	☐	☐
E-Canteen System	☑	☐	☐	☐
Canteen Management App	☑	☐	☐	☐
eCanteen	☑	☐	☐	☐
College Canteen	☑	☐	☐	☐
FoodPay	☑	☐	☐	☑
FoodSMART	☐	☑	☐	☐
QUICK-EATS	☑	☑	☑	☑

Other Related Research

Ref	Title	Year	Limitation
[11]	E-Canteen System	2023	Security Concerns, Customization Options, And Internet Connectivity
[3]	Canteen Food Ordering and Managing System	2022	stable internet connectivity, maintenance costs
[12]	Canteen Automation System with Payment Gateway	2020	maintenance or glitches, late updating of the menu card
[13]	Web based E- wallet Canteen Management System using RFID	2020	Connectivity issues, technical support requirements
[7]	Food Ordering Application for Canteen using React Native	2020	Data Security, Integration Complexity
[14]	A Mobile Phone App For the Provision of Personalized Food-Based Information in an Eating-Out Situation: Development and Initial Evaluation	2019	not real-world usage, reliance on consistent database updates, limited involvement and study of other stakeholders
[15]	Big Data in Food Industry	2020	Data Quality Issues, Integration Challenges

SYSTEM DESIGN

Quick-Eats comprises three primary user categories: students, vendors, and administrators. The students are responsible for placing food orders through the mobile. Vendors receive and manage these orders, ensuring timely and accurate fulfillment and can advertise on special discounts or offer through their web portal. Administrators oversee the management of students, vendors, and the canteen operations, in addition to handling advertisement placements within the application.

QuickEats comprises of two applications: a web application for administrative and vendor tasks, and a mobile application for students to order food within the university.

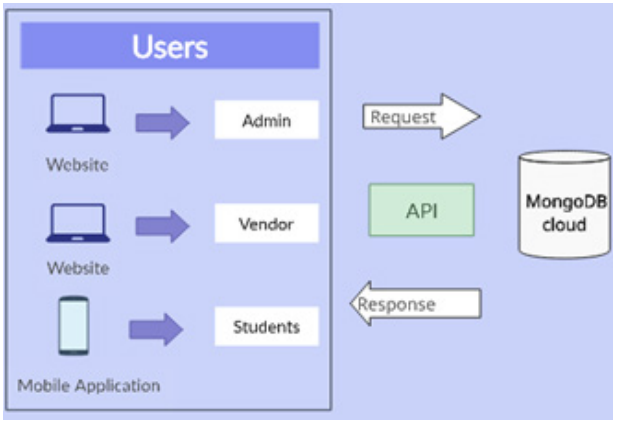

Fig. 1. System diagram

Figure 1 delineates the intricate connection between the system's backend and frontend components. The diagram illustrates that vendors and administrators will interface with the system via a web application, whereas students will utilize a mobile application. These applications are seamlessly integrated through APIs, which facilitate robust communication with a MongoDB Cloud database. This architecture underscores the sophisticated and dynamic framework designed to ensure efficient data management and user interaction across all platforms, thereby enhancing the overall functionality and user experience.

METHODOLOGY

In this section, the overall system flow is described. Quick-Eats is divided into two main components: a web application for administrative and vendor tasks and a mobile application for students to order food within the university.

A. Web Application;

Our web application leverages Laravel for stable and scalable server-side logic and data processing, with PHP managing data relationships and business logic. HTML provides the structural foundation, CSS ensures a responsive interface, and JavaScript enhances user experience through dynamic interactions.

a. Admin

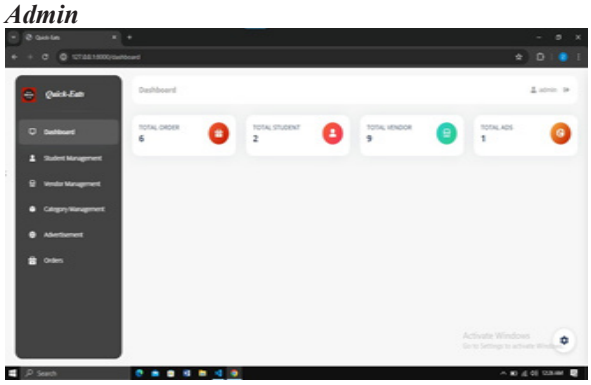

Fig.2. Admin Dashboard

In Figure 2, the administrative dashboard is depicted to provide a comprehensive overview, including the total counts of vendors, students, advertisements, and orders associated with all vendors.

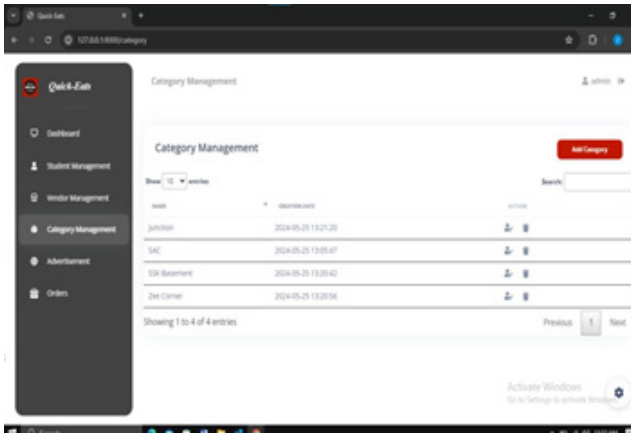

Fig.3. category management

Figure 3 shows that in our research setting, there are four distinct locations, each housing multiple canteens. Within the system, these locations are referred to as categories. This section, designated for category management, is accessible to the admin and displays the total number of categories. Further, the admin can delete and edit the category.

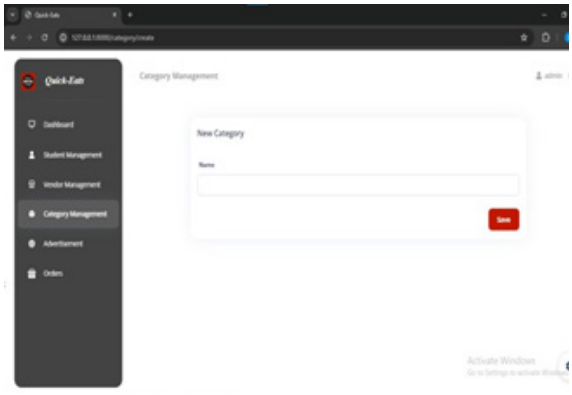

Fig. 4 New Category

Figure 4 illustrates the process of adding a new category. When the administrator clicks on the "Add Category" option, the system presents a form where the details for the new category can be entered.

b. Vendor

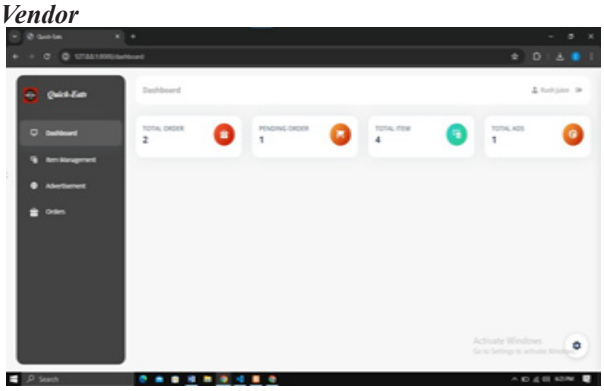

Fig.5. Vendor Dashboard

Figure 5 shows that the vendor (Rush Juice) dashboard is designed to provide a comprehensive overview, including the total counts of orders, pending orders, items, and advertisements.

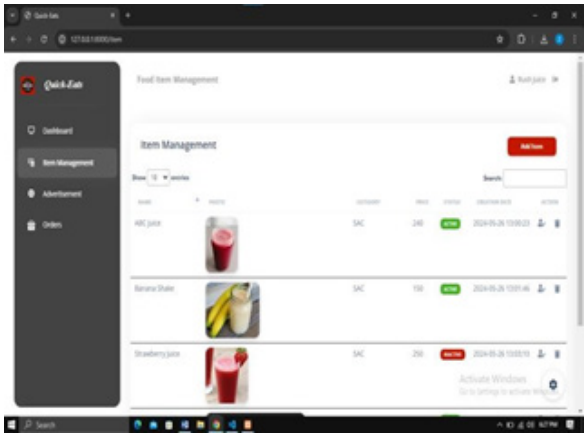

Fig.6. Vendor Item Management

Figure 6 illustrates the aggregate number of items entered into the system by the vendor along with the category, price and active or inactive status. The vendor can update the item in case of a change in price and status or delete the item if needed.

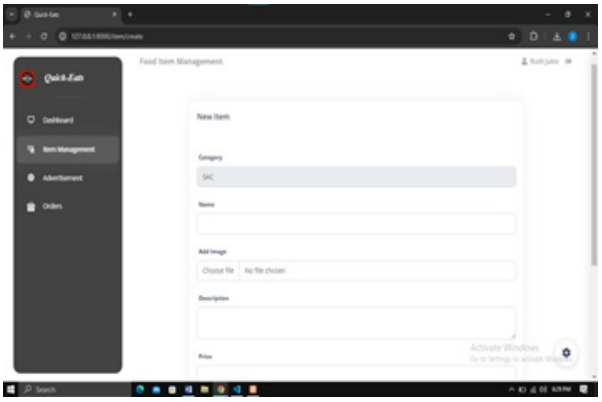

Fig.7. New Item

Figure 7 shows that the vendor is provided with the functionality to add items to the system. Upon selecting the "add item" option, the displayed screen appears. In this interface, the vendor is required to input the item's name, image, price, and description.

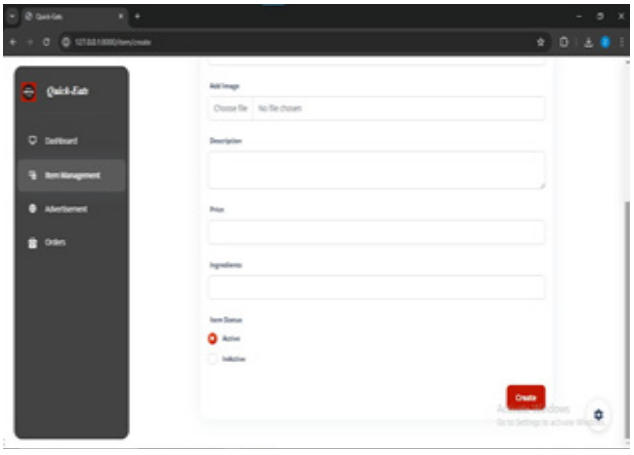

Fig.8. New Item Ingredients

Figure 8 shows the ingredients section for each item. This feature is designed to assist students who have specific allergies or religious boundaries related to certain ingredients. Further, inactive and active status for the item can also be listed.

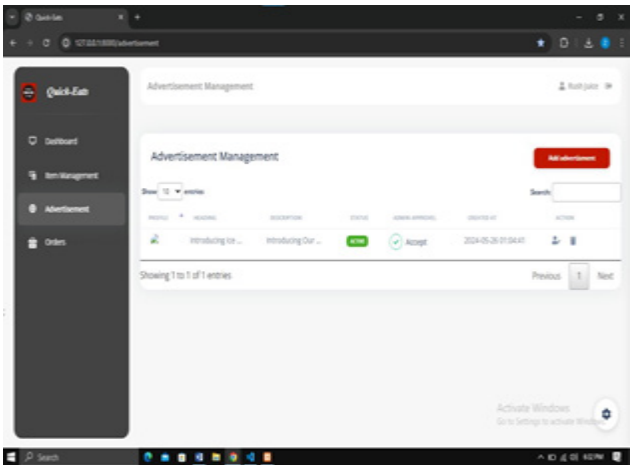

Fig.9. Vendor Advertisement

Figure 9 displays the vendor's advertisements and indicates whether each advertisement has received administrative approval.

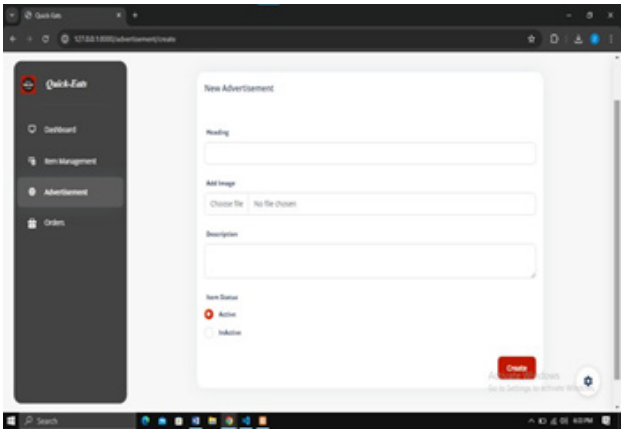

Fig.10. New Advertisement

Figure 10 indicates that upon the vendor selecting the "Add Advertisement" option, the corresponding screen will be displayed. This interface will prompt the vendor to input the necessary details for the advertisement, including a heading, image, description, and item status. The item status feature allows for advertisements to be publicized in advance, thereby generating anticipation and interest, with the actual product becoming available in the canteen at a later date.

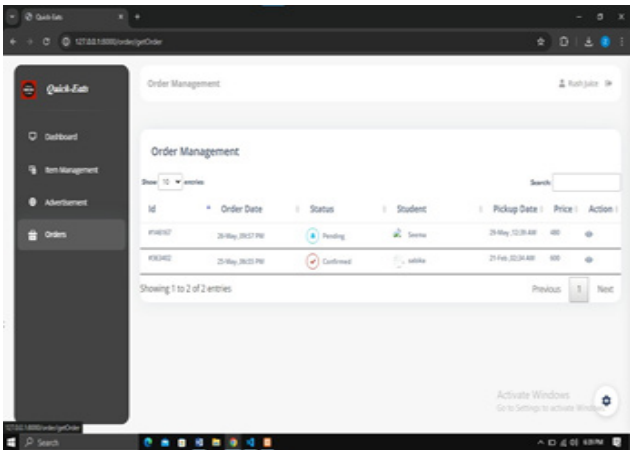

Fig.11. Vendor Orders

Figure 11 shows that vendor can manage their orders in the "Order" section, where orders placed by students through the mobile application will be displayed. This section will show the order ID, order date, order status (which the vendor can update), the student who placed the order, the pickup date and time, and the total price. Additionally, there is an "Action" section that allows vendors to view and update the details of each order.

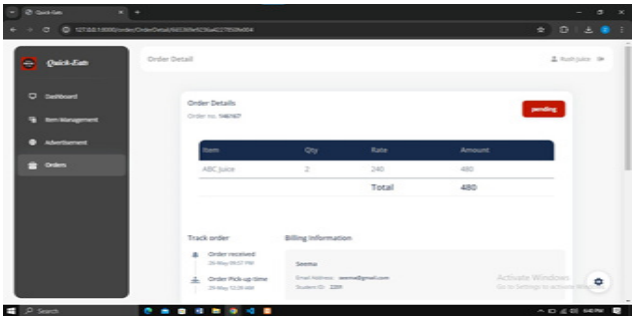

Fig.12. Vendor Order Action

Figure 12 shows that upon selecting the "Action" section of the screen, a detailed view of the order will be displayed. This view will include the price of each item in the order and the total cost. Additionally, it will show the student's email and student ID, as well as the order receipt time and the order pickup time.

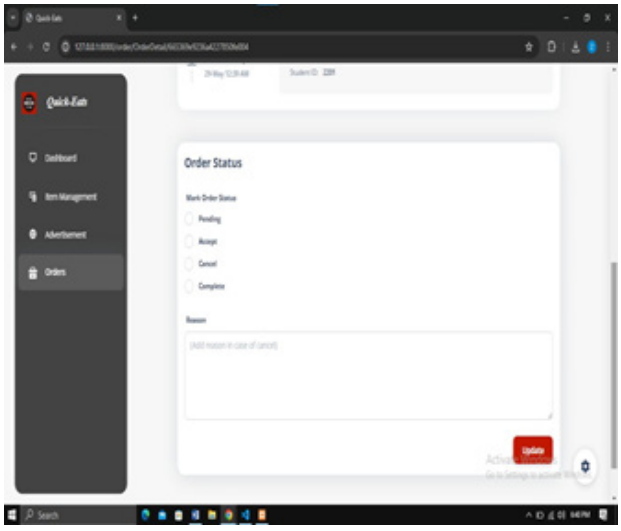

Fig.13. Order Update

Figure 13 shows that the vendor has the option to accept the order if the pickup time specified by the student is convenient. Alternatively, the vendor can cancel the order and provide a reason for the cancellation, such as the item being out of stock or due to limited availability. Once the order is fulfilled, the vendor will update the status to reflect its completion.

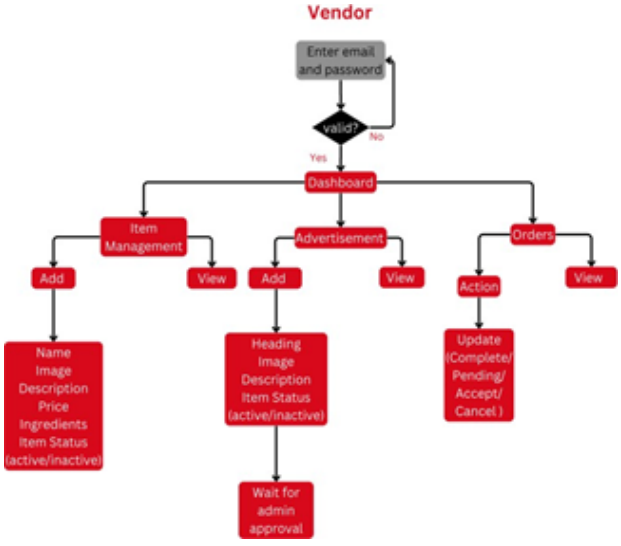

Fig.14. Vendor flow diagram

Figure 14 depicts the vendor's system flow diagram. This diagram offers a comprehensive overview of the processes and interactions within the vendor's system. Each element and its corresponding flow are methodically presented to clarify the operational framework and the sequence of activities from the beginning to the end of the vendor's services.

B.Mobile Application

It is made using React Native, which makes cross-platform mobile development easier and guarantees consistent functionality and performance.

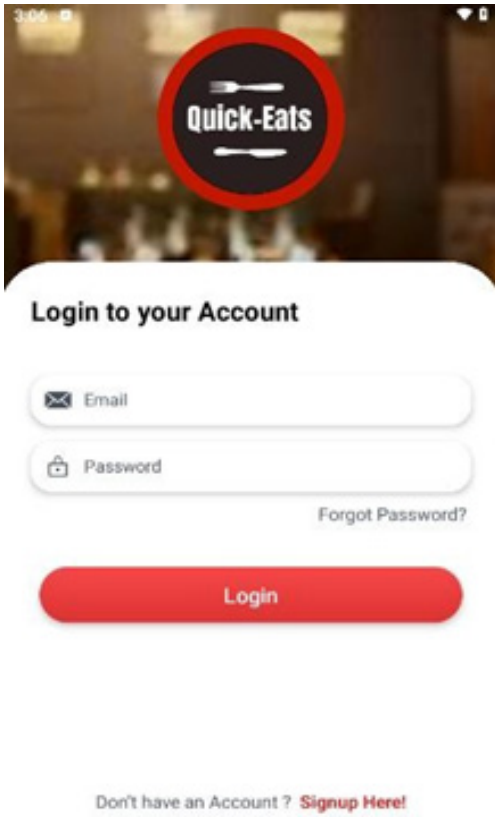

Fig.15.Mobile Application Login Page

The application's login screen, which is intended for student use, is seen in this illustration. Users only need to enter their password and email address to validate their identity. The interface offers a free registration option for first-time users. To help customers retrieve their accounts, a 'Forgot Password' tool is also accessible, guaranteeing a smooth and user-friendly experience.

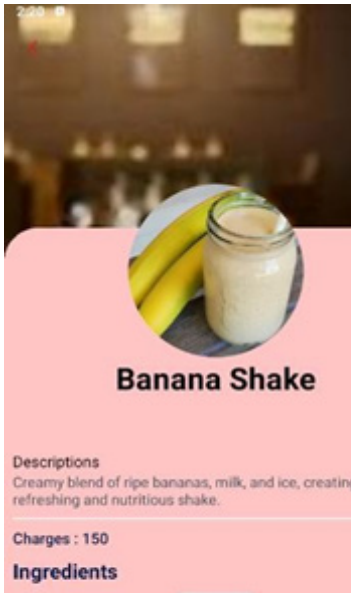

Fig.16. Food Item

Figure 16 offers a close-up look at a food item accessible through our app. It also has a thorough section on ingredients, intended to accommodate students who might have allergies or religious restrictions that require them to avoid particular products.

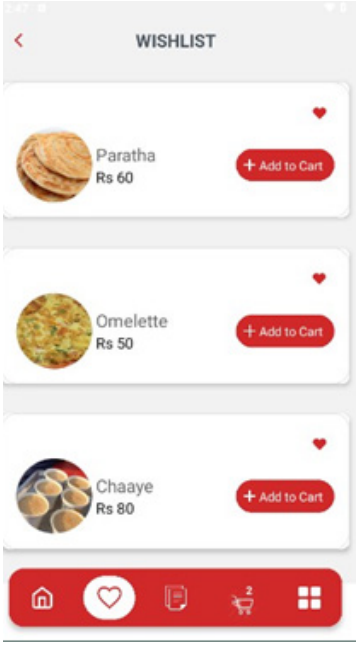

Fig.17. Wish list

Figure 15 illustrates the Wish list feature of Quick-Eats, a tool designed for the convenience and efficiency of student consumers. This innovative functionality allows students to add frequently purchased items to their personalized list, enabling seamless future orders. By leveraging this feature, students can effortlessly streamline their purchasing process, ensuring that their preferred items are readily accessible for quick and easy ordering later. The Wish list significantly enhances the user experience by catering to habitual buying patterns, promoting convenience and fostering user loyalty.

RESULTS

This part will explain the result predicted after using the application.

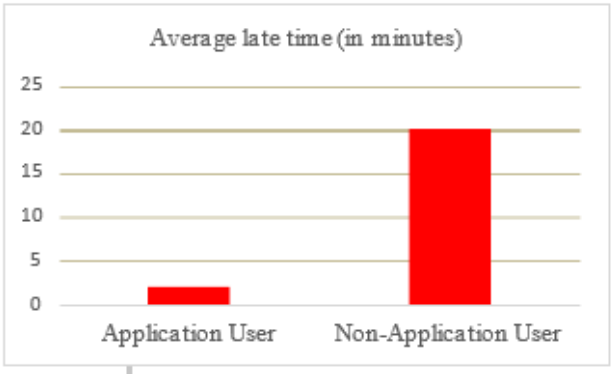

Fig.15. Decrease classroom delays by utilizing Quick-Eats

Figure 15 demonstrates that students utilizing the Quick-Eats mobile application consistently arrive at their classrooms earlier than their counterparts who do not use the application. This finding underscores a primary objective of our application: to enhance the punctuality and overall quality of student attendance significantly. The data indicate that Quick-Eats not only meets but exceeds expectations in facilitating timely arrival, thereby contributing to improved academic engagement and performance.

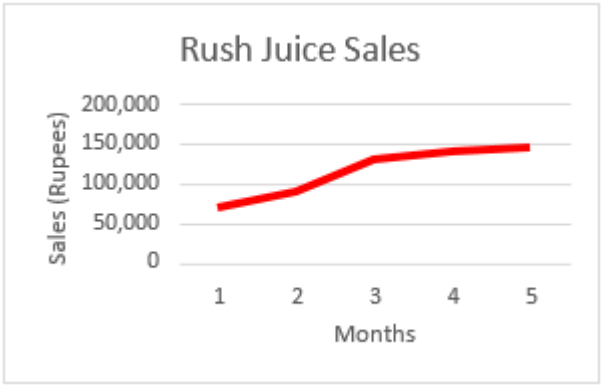

Fig.16. Sales Trajectory of Rush juice

Figure 16 shows how Rush Juice's sales changed when the university launched the mobile app. In the months that followed, the app had a big effect on how people bought things, which led to a big increase in sales.

This big rise shows that the software works well as a tool for sellers to change their businesses. The mobile app has been a growth driver because it makes purchasing easier and more enjoyable for customers.

The research shows that the app might help businesses reach more people in the university community, making it an essential tool for companies that want to do well in this market. Because of this, the mobile app has changed the way customers talk to suppliers, and its effects are likely to continue changing the university's retail scene.

CONCLUSION AND FUTURE WORK

The Quick-Eats initiative is poised to address a significant challenge faced by students at the Institute of Business Management (IOBM): the prolonged lines and delays in the canteen's meal ordering system, exacerbated by the tight scheduling of back-to-back classes with merely a 15-minute break in between. This initiative has the transformative potential to revolutionize the IOBM student experience. By specifically targeting and mitigating the inefficiencies associated with food ordering, the Quick-Eats application aims to substantially enhance operational efficiency and reduce student stress. The anticipated improvements are expected to not only streamline the meal procurement process but also contribute to a more conducive and stress-free academic environment.

Quick-Eats may be used by more colleges and universities, which would mean that students would be late less often and attendance rates would go up across all schools. Also, this app will make it feasible to digitize cafeteria operations, which will have a lot of benefits, such as making things easier and more efficient for schools, students, and suppliers. It is hoped that using this one-of-a-kind solution in a lot of different places will make things easier and more cohesive, which will make everyone happier and more productive in school.

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