Design Document for VBA Canteen Management System

VBA PROJECT BY NAKSH JAIN SONIGARA AND PAVAN YADAV.

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1. INTRODUCTION

The Canteen Management System is a comprehensive software solution designed to modernize and optimize canteen operations. It aims to simplify the complexities of managing a canteen by automating key processes such as order management, inventory tracking, payment processing, and report generation

1.1 Project Overview

The Canteen Management System integrates essential features to enhance canteen operations, including:

- **Order Management**: Facilitates order placement, tracking, and management for efficient service delivery.
- **Payment Processing**: Offers a secure payment gateway for convenient bill settlement by customers.
- **Report Generation**: Generates comprehensive reports to provide insights into sales, inventory, and other key metrics.

1.2 Objective

The Canteen Management System for **Chikitsak Samuha's Patkar Varde** College Canteen aims to address the challenges faced by the traditional canteen, including manual order processing and lack of data storage. By automating these processes, the system seeks to improve efficiency, enhance customer experience, and enable robust management system. Specifically, the objectives include:

- **Streamlining Operations**: Replace manual tasks with automated processes to save time and reduce errors at the Canteen.
- **Improving Customer Experience**: Provide a seamless ordering and payment experience for customers.
- **Centralizing Data Management**: Store all information, including orders and sales, in a centralized system for easy access and analysis by the team.
- **Reducing Costs**: Minimize operational costs associated with manual processes, errors, and inefficiencies at.

2. System Overview

The Chikitsak Samuhas College Canteen: Cravory serves as a vital hub within the college premises, catering to the culinary needs of students, faculty, and staff. Currently, the canteen operates through conventional methods, relying heavily on manual processes for order-taking, payment handling, and record-keeping. This traditional approach often leads to inefficiencies, delays, and inaccuracies, hindering the canteen's overall performance.

2.1 Brief Description of the Canteen Management System (CMS).

The Canteen Management System (CMS) is a comprehensive software solution designed to modernize and streamline operations at Cravory Canteen.

- **Registration:** Upon launching the system, users are prompted to register, providing essential details for identification and access purposes.

- **Menu Selection:** The CMS offers a user-friendly interface for customers to browse the canteen's menu, select items of their choice, and place orders seamlessly.

- **Payment Processing:** Once orders are confirmed, the CMS facilitates secure and efficient payment processing, allowing users to settle bills conveniently.

- **Bill Generation:** After successful payment, the system generates detailed bills, providing customers with transparent breakdowns of their orders and expenses.

- **Team Operations:** Behind the scenes, canteen staff utilize the CMS to manage orders, track inventory levels, process payments, and ensure smooth operations.

- **Report Generation:** The CMS empowers administrators to generate comprehensive reports on sales, inventory, and other key metrics, facilitating data-driven decision-making and performance evaluation.

2.2 System Architecture Overview.

The User Interface (UI) of the Canteen Management System (CMS) is designed with simplicity and functionality in mind, catering to both customers and staff members. The system architecture primarily revolves around a series of user-friendly forms, each serving a specific purpose within the canteen's operational workflow.

2.2.1 Order Now Front Page

The "Order Now" front page features a single button prompting users to initiate the ordering process instantly. This minimalist interface serves as the entry point to the system, encouraging swift navigation and effortless order placement.
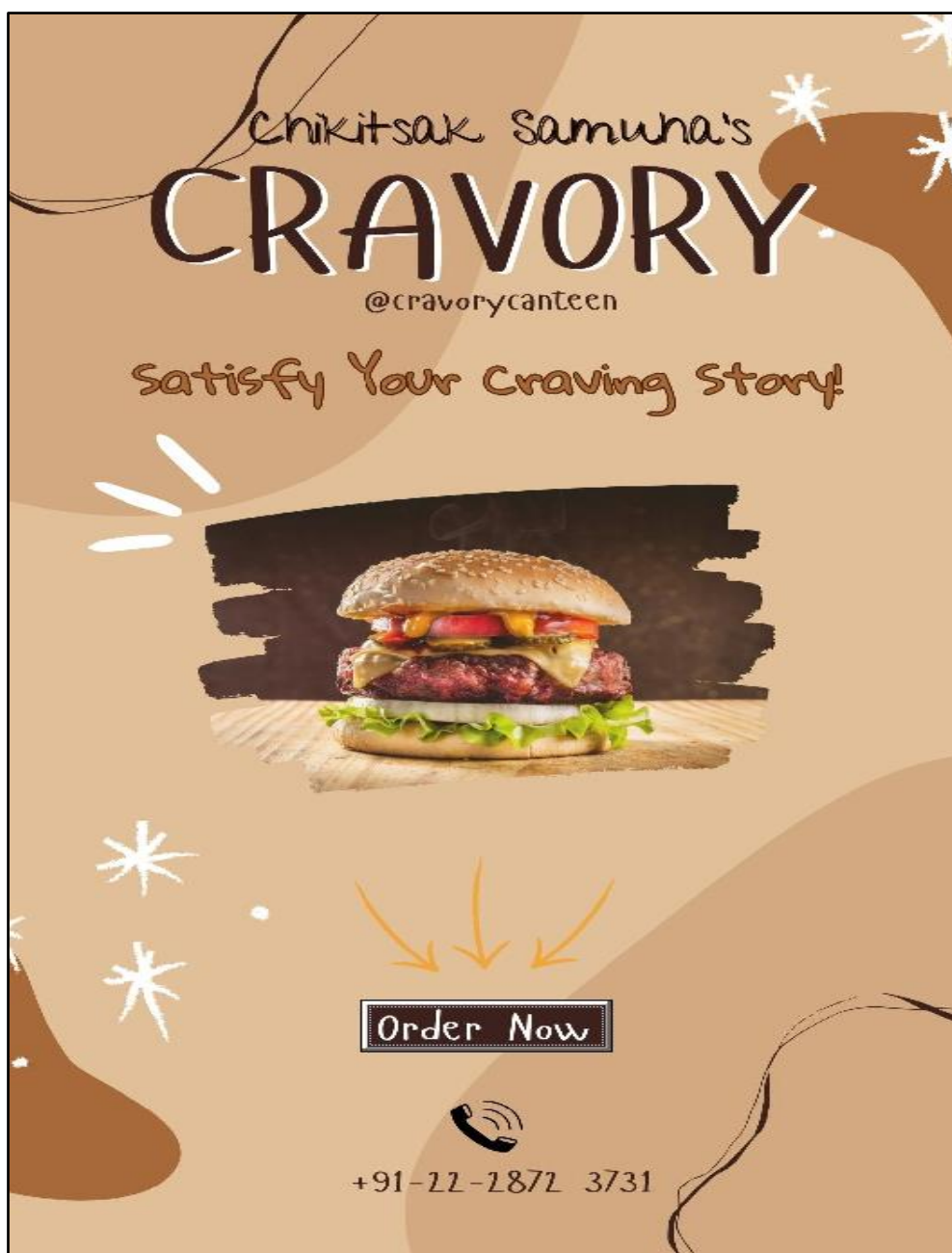
2.2.2   Registration Page.

The Registration Page serves as the initial step for users to access the features of the Canteen Management System (CMS). It provides a user-friendly interface where individuals can input their essential details to create an account.
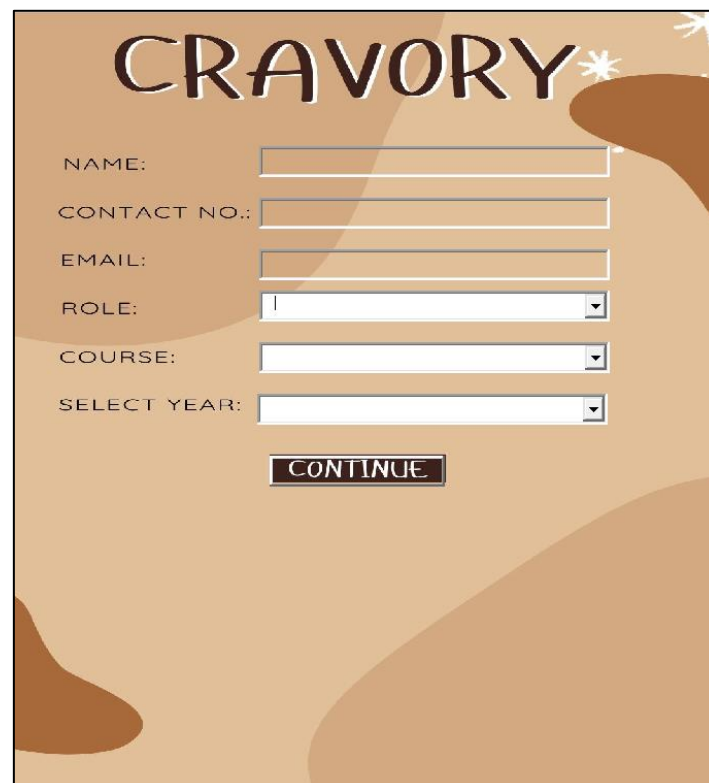
Upon accessing the Registration Page, users are prompted to enter the following information:

- **Name**: Users are required to input their full name, ensuring accurate identification within the system.

- **Contact Number**: A valid contact number is necessary for communication purposes and order verification.

- **Email Address**: Users must provide a valid email address for account verification and communication regarding their orders.

- **Role**: Users specify their role within the institution, selecting from options such as student, faculty, staff, or management.

For student users, additional details are requested:

- **Course Selection**: Students are prompted to select their course from a dropdown menu. Available course options are based on the institution's offerings.

- **Year of Study**: The available years of study are dynamically determined based on the selected course. For instance, a Bachelor of Science (BSc) course typically spans three years, while other courses may have different durations.

Note: that if the user's role is anything other than "student," the Course and Year selection options are disabled, as these details are pertinent only to students. Additionally, the available years for selection are adjusted dynamically based on the chosen course, ensuring accuracy and efficiency in the registration process.

2.2.3 Menu Page.

The Menu UserForm presents a user-friendly interface with two multipage tabs: one for vegetarian items and the other for non-vegetarian items. Each tab features checkboxes for item selection and combo boxes for selecting quantities ranging from 1 to 10. Users have the flexibility to choose items from both the vegetarian and non-vegetarian menus if desired. Upon making selections, users proceed to the payment process by clicking the "Continue" button.

It's important to <u>Note</u> that the non-vegetarian menu tab is available only on Thursdays and Saturdays. Hence, on other days, this tab remains hidden from view. This ensures that users are presented with relevant options based on the canteen's offerings for the day.

Cravory Canteen — MENU ~NON VEG~			Cravory Canteen — MENU ~VEG~		
SNACKS			**SNACKS**		
☐ Chicken Sandwich		₹40/-	☐ VadaPav		₹16/-
☐ Omlet Pav		₹30/-	☐ Veg Cutlet		₹30/-
☐ Egg Bhurji Pav		₹50/-	☐ Sabudana Khicdhi		₹60/-
☐ Egg Maggie		₹60/-	☐ Mendu Vada		₹25/-
LUNCH			**LUNCH**		
☐ Non - Veg Thali		₹120/-	☐ Veg Thali		₹80/-
☐ Chicken Masala		₹100/-	☐ Veg Pulav		₹70/-
☐ Chicken Biryani		₹120/-	☐ Veg Triple Schezwan Rice		₹120/-
☐ Egg Schezwan Fried Rice		₹140/-	☐ Phodnicha Bhaat		₹60/-
DESSERTS			**DESSERTS**		
☐ Ice Cream		₹40/-	☐ Ice Cream		₹40/-
☐ Chokie Chokie		₹2/-	☐ Chokie Chokie		₹2/-
☐ Sheera		₹40/-	☐ Pineapple Sheera		₹70/-
☐ Ras Malai		₹90/-	☐ Gajar Halwa		₹80/-
DRINKS			**DRINKS**		
☐ Special Tea		₹12/-	☐ Tea		₹10/-
☐ Coffe		₹20/-	☐ Cold Coffe		₹20/-
☐ Soft Drink		₹35/-	☐ Butter Milk		₹30/-
☐ Falooda		₹50/-	☐ Hot Milk		₹10/-
Confirm			Confirm		

2.2.4 Bill Generation.

The Bill UserForm serves as a comprehensive summary of the user's order, providing essential details such as the customer's name, the date of the transaction, and the time of purchase. The centerpiece of the Bill UserForm is a ListView control, which dynamically populates with the items selected by the user, along with their corresponding quantities and prices.

Upon finalizing the order and accessing the Bill UserForm, the CMS automatically generates a sequential invoice number, ensuring each transaction is uniquely identified. In addition to listing the ordered items, the Bill UserForm calculates the total amount payable, inclusive of an 18% Goods and Services Tax (GST) .

Cravory Canteen
S. V. Road, Goregaon (West), Mumbai.

DATE: 24-03-2024
TIME: 04:58:40 PM
NAME: Naksh Jain
EMAIL: jainnaksh11@gmail.com
INVOICE NO: 563230002

ITEM	Quantity	PRICE
VadaPav	2	16
Veg Thali	1	80
Tea	1	10

TOTAL: ₹ 122.00
TAXES: ₹ 21.96
Amount Payable: ₹ 143.96

---THANKYOU---

Satisfy Your Craving Story!

@cravorycanteen

3. Data Model and Database Design

The Data Model and Database Design of the Canteen Management System (CMS) are meticulously crafted to ensure efficient data storage, retrieval, and management. This section encompasses the Entity-Relationship (ER) diagram and the underlying Excel sheets utilized within the CMS.

3.1 Entity-Relationship (ER) Diagram

The ER diagram serves as a visual representation of the various entities, attributes, and relationships within the CMS database. It illustrates how different entities such as users, items, orders, and transactions are interconnected, providing valuable insights into the system's data architecture and flow.
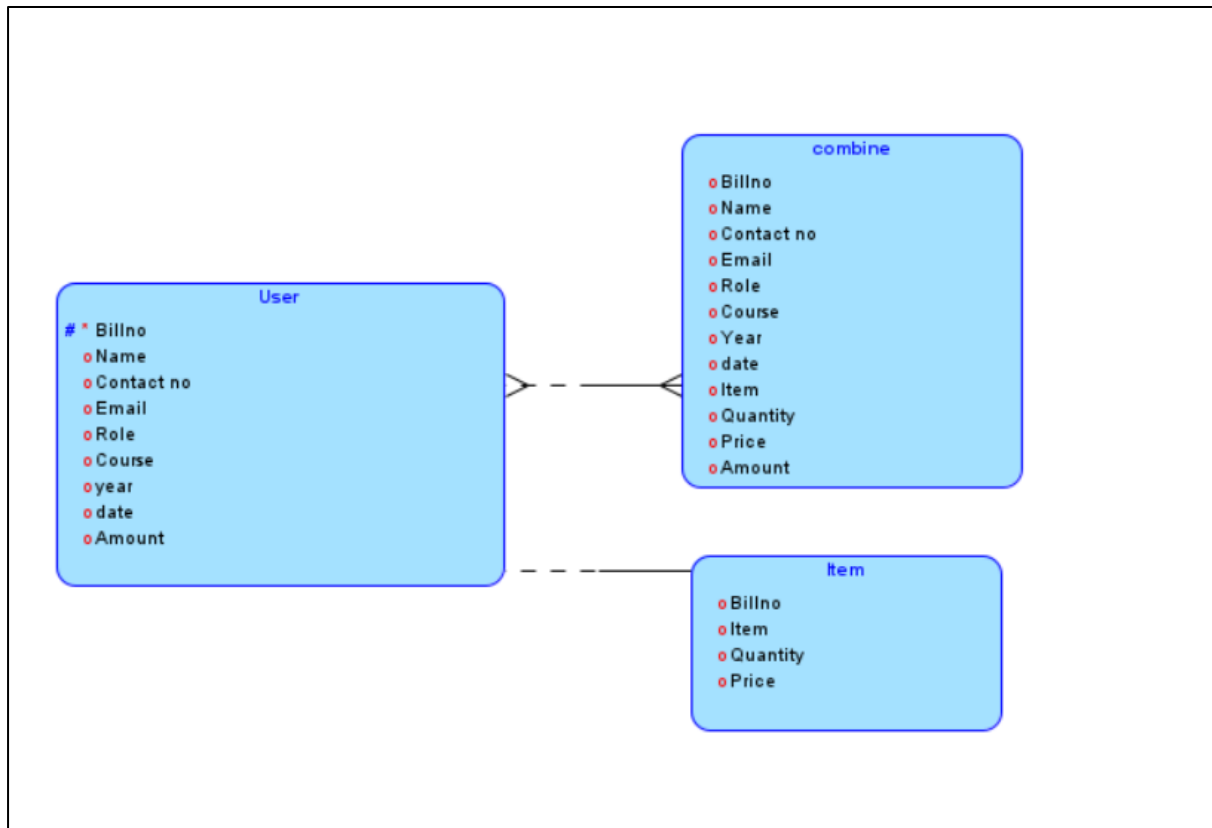
3.2 Excel Sheets

3.2.1 User Excel Sheet

This Excel sheet contains essential information about the users interacting with the CMS, including their names, contact details, roles (student, faculty, staff, management), and relevant academic Information .

Billno	Name	Contact no	Email	Role	Course	Year	Date	Amount
563720001	Naksh		9920756372 jainaksh576@gmail.com	Student	BSc in Data Science	1st Year	24-03-2024	336
563330002	Pavan		9920756333 pavansy@gmail.com	Student	BSc in Computer Science	2nd Year	24-03-2024	94
331770003	Jiya		9892433177 jiya123@gmail.com	Student	MSc in Physics	Second Year	24-03-2024	290
376570004	Priya		9682737657 priya@gmail.com	Faculty	--	--	24-03-2024	140
672650005	Hammed		9738467265 hameed12@gmail.com	Faculty	--	--	24-03-2024	560
528630006	bobby		9111902863 bobby@gmail.com	Management	--	--	24-03-2024	40
578650007	siraj		9837657865 siraj@gmail.com	Staff	--	--	24-03-2024	120
657890008	dhruvi		9127365789 dhruvi@gmail.com	Student	MSc in Physics	First Year	24-03-2024	320
546430009	kala		9878654643 kala@gmail.com	Student	PG in Data Science	1st Year	24-03-2024	90
652730010	khusboo		9798765273 khusboo@gmail.com	Management	--	--	24-03-2024	109

3.2.2 Item Excel Sheet

The Item Excel sheet catalogues the various food and beverage items ordered , along with pertinent details such as item names, prices, availability status, and categorizations (vegetarian, non-vegetarian).

Item	Quantity	Price	Billno
VadaPav	1	16	563720001
Sabudana Khicdhi	3	180	563720001
Veg Pulav	2	140	563720001
Veg Thali	1	80	563330002
Chokie Chokie	2	4	563330002
Tea	1	10	563330002
Phodnicha Bhaat	2	120	331770003
Mendu Vada	2	50	331770003
Phodnicha Bhaat	2	120	331770003
Veg Pulav	2	140	376570004
Chicken Sandwich	2	80	672650005
Omlet Pav	2	60	672650005
Egg Schezwan Frie	3	420	672650005
Chicken Sandwich	1	40	28630006

3.2.3 Combined Data Sheet

The Combined Data Sheet integrates user and item data, providing a holistic view of the CMS's operational landscape. By consolidating user information with item details, this sheet enables seamless transaction processing, order tracking, and customer engagement. Additionally, it serves as a central repository for generating reports, analyzing trends, and optimizing canteen operations based on user preferences and consumption patterns.

| Billno	Item	Quantity	Price	Name	Contact no	Email	Role	Course	Year	Date	Amount
563720001	VadaPav	1	16	Naksh	9920756372	jainaksh576@gmail	Student	BSc in Data Sci	1st Year	24-03-2024	336
563720001	Sabudana Khicdhi	3	180	Naksh	9920756372	jainaksh576@gmail	Student	BSc in Data Sci	1st Year	24-03-2024	336
563720001	Veg Pulav	2	140	Naksh	9920756372	jainaksh576@gmail	Student	BSc in Data Sci	1st Year	24-03-2024	336
563330002	Veg Thali	1	80	Pavan	9920756333	pavansy@gmail.co	Student	BSc in Comput	2nd Year	24-03-2024	94
563330002	Chokie Chokie	2	4	Pavan	9920756333	pavansy@gmail.co	Student	BSc in Comput	2nd Year	24-03-2024	94
563330002	Tea	1	10	Pavan	9920756333	pavansy@gmail.co	Student	BSc in Comput	2nd Year	24-03-2024	94
331770003	Phodnicha Bhaat	2	120	Jiya	9892433177	jiya123@gmail.con	Student	MSc in Physics	Second Y	24-03-2024	290
331770003	Mendu Vada	2	50	Jiya	9892433177	jiya123@gmail.con	Student	MSc in Physics	Second Y	24-03-2024	290
331770003	Phodnicha Bhaat	2	120	Jiya	9892433177	jiya123@gmail.con	Student	MSc in Physics	Second Y	24-03-2024	290
376570004	Veg Pulav	2	140	Priya	9682737657	priya@gmail.com	Faculty	--	--	24-03-2024	140
672650005	Chicken Sandwich	2	80	Hammed	9738467265	hameed12@gmail.c	Faculty	--	--	24-03-2024	560
672650005	Omlet Pav	2	60	Hammed	9738467265	hameed12@gmail.c	Faculty	--	--	24-03-2024	560
672650005	Egg Schezwan Frie	3	420	Hammed	9738467265	hameed12@gmail.c	Faculty	--	--	24-03-2024	560
528630006	Chicken Sandwich	1	40	bobby	9111902863	bobby@gmail.com	Management	--	--	24-03-2024	40
578650007	Egg Maggie	2	120	siraj	9837657865	siraj@gmail.com	Staff	--	--	24-03-2024	120
657890008	Veg Thali	1	80	dhruvi	9127365789	dhruvi@gmail.com	Student	MSc in Physics	First Year	24-03-2024	320
657890008	Non - Veg Thali	2	240	dhruvi	9127365789	dhruvi@gmail.com	Student	MSc in Physics	First Year	24-03-2024	320
546430009	Ice Cream	2	80	kala	9878654643	kala@gmail.com	Student	PG in Data Sci	1st Year	24-03-2024	90
546430009	Chokie Chokie	5	10	kala	9878654643	kala@gmail.com	Student	PG in Data Sci	1st Year	24-03-2024	90
652730010	Chokie Chokie	2	4	khusboo	9798765273	khusboo@gmail.co	Management	--	--	24-03-2024	109
652730010	Soft Drink	3	105	khusboo	9798765273	khusboo@gmail.co	Management	--	--	24-03-2024	109

4. Data Validation

In the Canteen Management System, robust data validation procedures are integral to maintaining data integrity and ensuring accurate processing of user inputs. Through meticulous validation checks, potential errors and inconsistencies are identified and rectified, bolstering the system's reliability and usability.
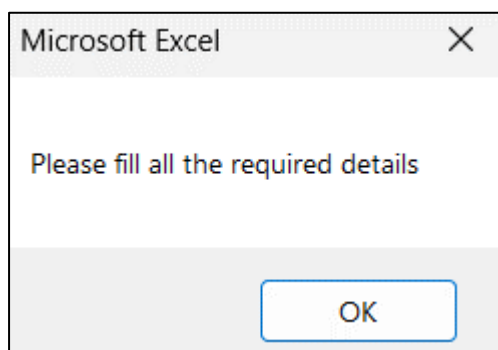
4.1 Input Validation

In Register Page (Userform 2), rigorous input validation procedures are implemented to ensure the integrity and accuracy of user-provided data. These validations encompass multiple fields, including name, email, contact number, and required combobox selections.

- **Name, Email, and Contact Number Validation:** The name, email, and contact number fields undergo validation to verify their format and content. Name validation ensures that only alphabetic characters are accepted, while email validation checks for adherence to standard email format conventions. Contact number validation ensures that the provided number consists of the appropriate number of digits, typically 10 digits for a standard phone number and checks if all the required fields are filled.
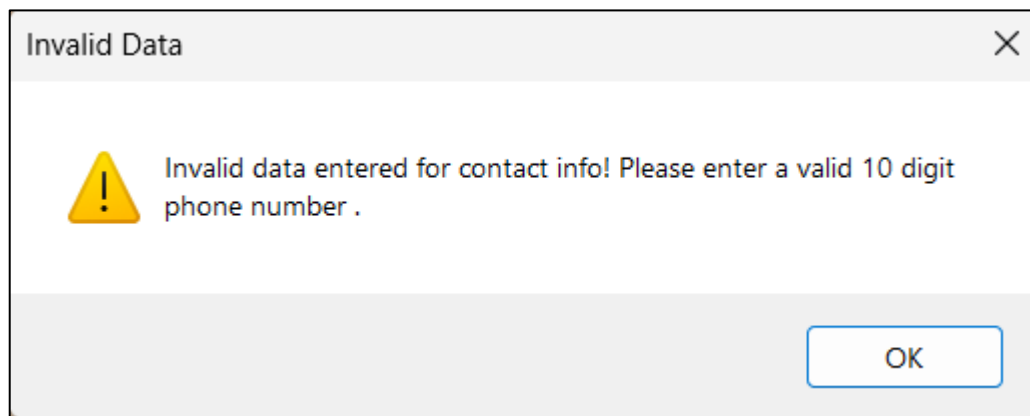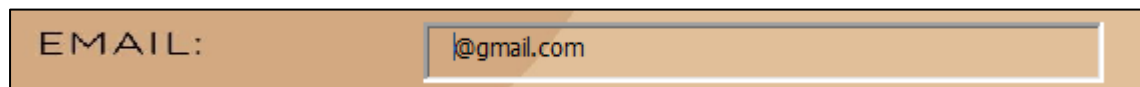
- **Required Combobox Selection:** Certain comboboxes within UserForm 2 are marked as required fields, necessitating user selection before proceeding. Validation mechanisms are employed to enforce the mandatory selection of these comboboxes, ensuring that users provide all necessary information for successful form submission.

4.2 Format Validation

To expedite the input of email addresses, a convenient auto-fill feature is implemented. When users enter their email address into the designated email field, the system automatically appends the "@gmail.com" suffix, simplifying the data entry process and reducing the likelihood of typographical errors. By providing auto-fill functionality for email addresses, UserForm 2 promotes efficiency and accuracy in data entry, contributing to a seamless user experience within the Canteen Management System.

4.3 Selection Validation

Before finalizing an order, the system checks if all required checkboxes, indicating the selected items, are ticked. If any checkbox or combo box associated it for quantity in menu page is left unchecked, the system prompts the user with a message indicating that at least one checkbox must be selected to proceed with the order.
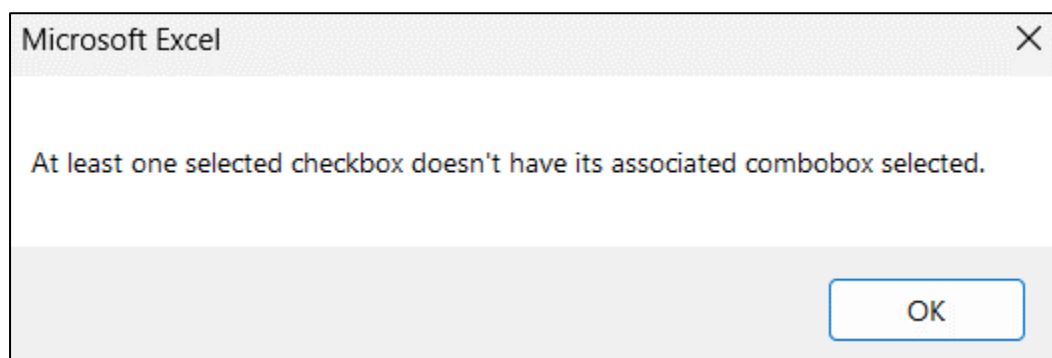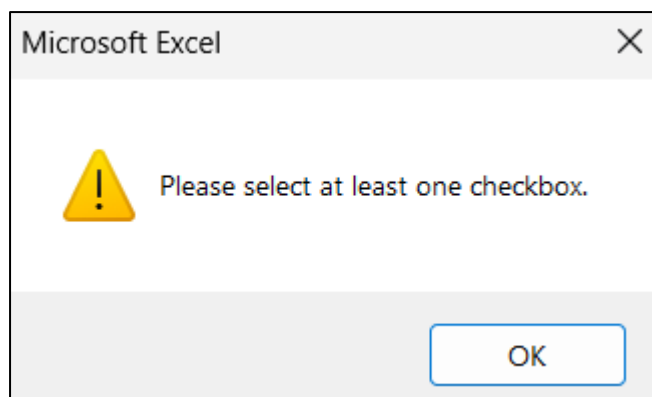
5. System Functionality

In the Canteen Management System, the system functionality encompasses various features to streamline the ordering process and ensure a seamless user experience..

5.1 Payment Processing

Upon selecting items and quantities on the menu page, users proceed to the payment processing phase by clicking the "Continue" button. At this stage, the system prompts the user with a confirmation message asking, "Do you want to make the payment?" This step is included for testing purposes and allows users to proceed with or without making a payment.
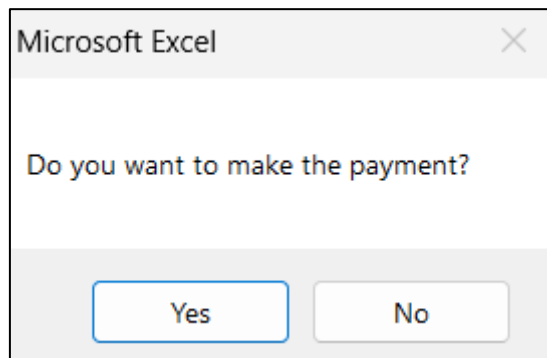

- **Integration with Razorpay Payment Gateway API:** If the user chooses to make a payment, the system seamlessly integrates with the Razorpay payment gateway API. This integration enables users to make payments using various modes, including credit/debit cards, net banking, UPI, and digital wallets. The user is redirected to the Razorpay payment page, where they can securely complete the transaction.
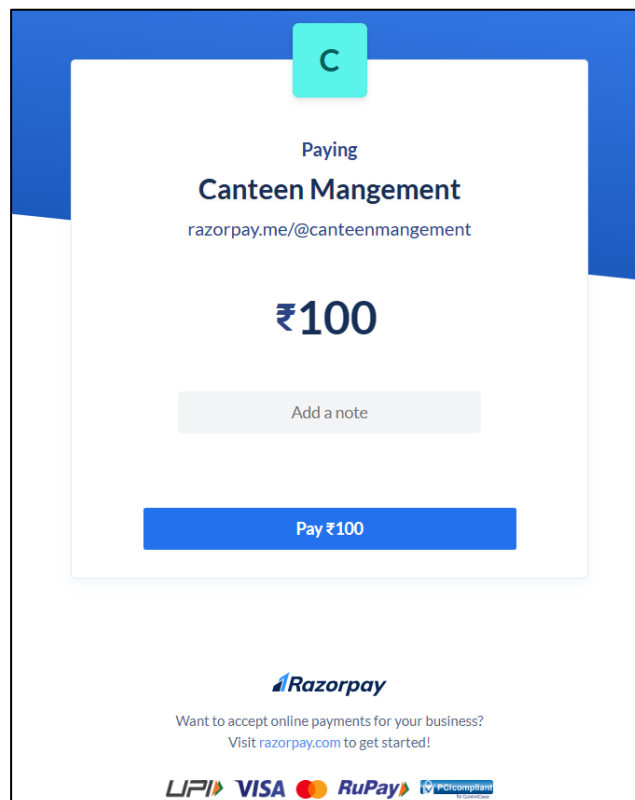
- **Secure Payment Processing:** During the payment process, the system ensures the highest level of security by encrypting sensitive data and adhering to industry-standard security protocols. Users can confidently make payments knowing that their financial information is protected.

- **Settlement Cycle and Payment Confirmation:** After the user completes the payment process, the amount paid is securely transferred to the canteen's bank account through the Razorpay settlement cycle.

Transaction Dashboard For The Canteen:
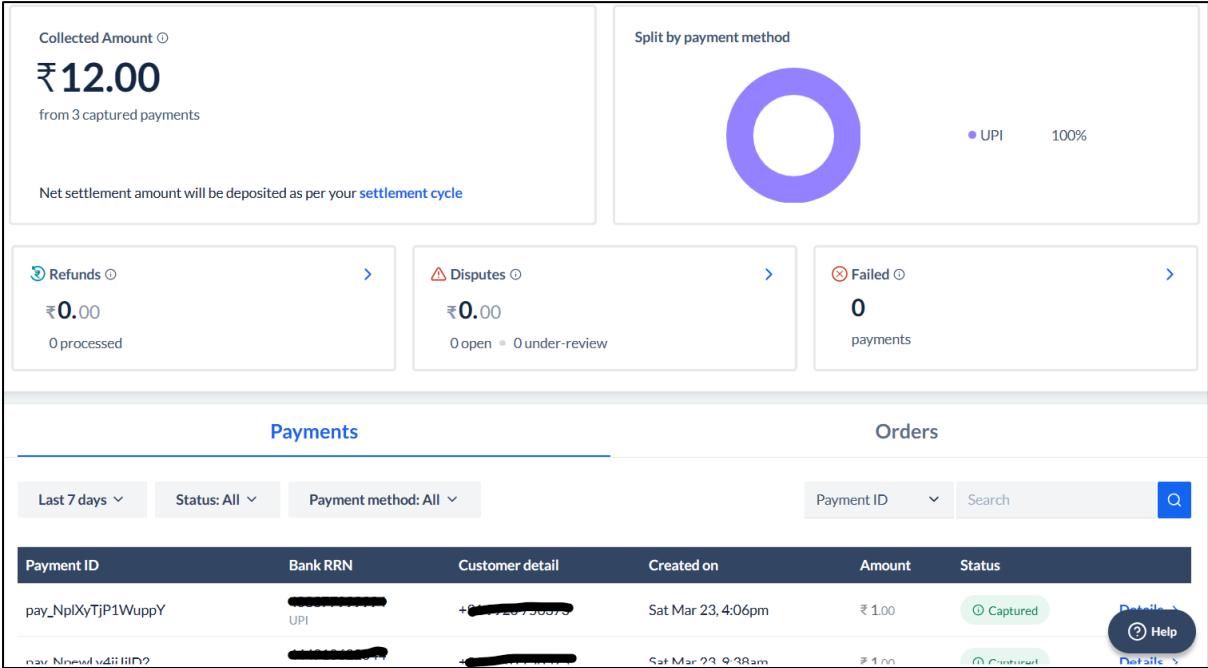
5.2 Email Report Generation

The canteen managers have the option to generate comprehensive reports summarizing their activities and transactions within the canteen. To ensure convenient access to these reports, the system incorporates email functionality, allowing users to receive their reports directly in their email inbox.

Upon selecting the "Generate Report" option, the system automatically generates the report and dispatches it to the specified email address. This automated process eliminates the need for manual report retrieval and enhances user convenience.

Pivot Sheet PDF Report   ⌄

P   **pavansy2006@gmail.com**   ☀ ↩ ↩ ↪ | ⋯
    To: You   Sun 2024-03-24 22:39

    📄 PivotSheet6 report.pdf   ⌄
       115 KB

Dear recipient,

Please find the attached Pivot Sheet PDF report.

This report has been generated by Naksh on Sunday, March 24, 2024 10:39 PM.

This is an automated email. Kindly review the attached report at your convenience.

Best regards,
Group 5

6. Report Generation

The Canteen Management System offers robust reporting capabilities, allowing managers to generate timely and comprehensive reports to gain insights into canteen activities. Here's a detailed overview of the report generation process:

- **Backend Report Generation**: Canteen managers have access to a backend reporting interface where they can generate customized reports based on specific criteria and parameters. This interface provides flexibility in selecting the desired rows and columns to include in the report.


- **Selection of Report Parameters**: Managers can choose from a variety of parameters to tailor the report according to their requirements. These parameters may include items purchased, customer demographics (such as course, year, and role), transaction dates, and more.

- **Dynamic Filtering Options**: The reporting interface offers dynamic filtering options, allowing managers to filter data based on specified criteria. Numeric columns, such as quantity purchased or total amount spent, can be filtered based on set value ranges to refine the scope of the report.

- **Aggregation and Pivot Tables**: Upon selecting the desired rows and columns, managers can apply aggregation functions to summarize the data effectively. Pivot tables are utilized to organize and present the aggregated data in a structured format, enabling managers to identify trends and patterns with ease.

- **Chart Generation**: To enhance data visualization and analysis, the system automatically generates charts based on the selected data. Various chart types, including bar charts, pie charts, and line graphs, are available to visually represent key metrics and insights derived from the report data.
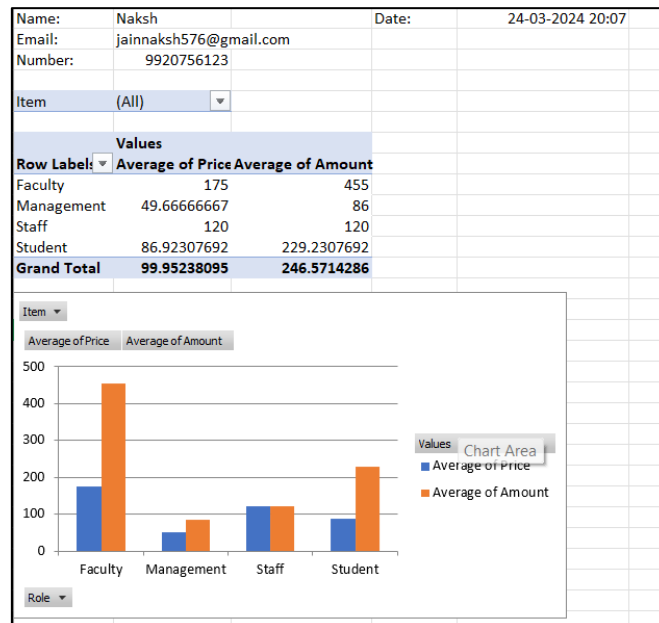
- **Conversion to PDF Format**: Once the report is generated and formatted, it is automatically converted into PDF format for easy distribution and sharing.
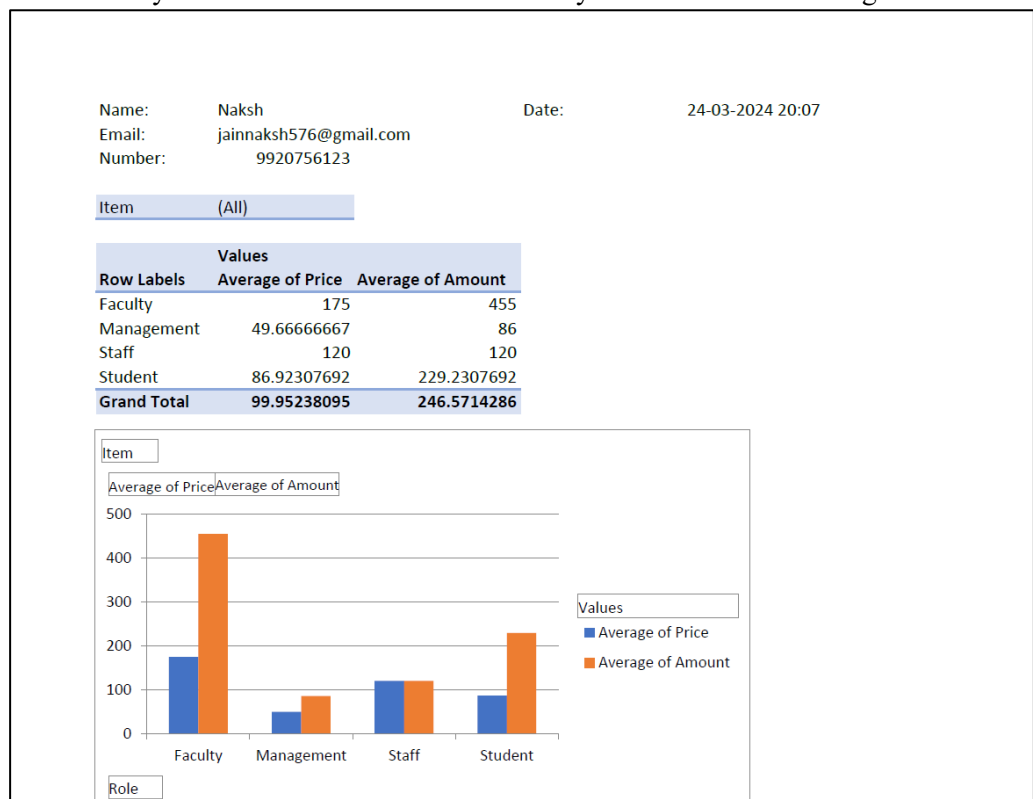
Upon finalizing the report, managers have the option to email it directly to specified recipients, such as stakeholders or other relevant parties.

7. Conclusion

The Canteen Management System represents a significant leap forward in streamlining canteen operations at Chikitsak Samuhas College. By integrating efficient ordering, payment processing, and reporting functionalities, the system aims to revolutionize the way canteen services are managed.

From the outset, our goal was to address the challenges faced by the canteen, including manual processes, lack of data storage, and inefficient management practices. With this in mind, we designed a user-friendly interface that allows students, faculty, and staff to easily place orders, track transactions, and generate reports.

One of the key highlights of the project is the seamless integration of various modules, such as user registration, menu selection, and bill generation, into a cohesive system. Each module is carefully crafted to provide a smooth and intuitive user experience, enhancing overall efficiency and productivity. The successful implementation of the payment processing feature stands as a significant achievement of the Canteen Management System project. By seamlessly integrating with the Razorpay payment gateway API, users can now make secure payments using various modes, ensuring a hassle-free transaction experience.

Furthermore, the system offers advanced features such as dynamic filtering, pivot tables, and chart generation in the reporting module, enabling managers to gain valuable insights into canteen operations and make data-driven decisions.

In summary, the Canteen Management System represents a comprehensive solution to the challenges faced by the canteen, offering improved efficiency, transparency, and data-driven decision-making. By leveraging technology to streamline operations and enhance user experience, we are paving the way for a more efficient and effective canteen management process.