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## FIRST LADIES HALL DINING MANAGEMENT SYSTEM

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*Student:*

Jisan Ahmed (2019831040)

Ridwanur Rashid Siam  
(2019831060)

Jerin Hasan Priya (2019831081)

*Advisor:*

Prof. Dr. Ahsan Habib

Asst. Professor,  
Institute of Information  
and Communication Technology,  
SUST.

**Software Engineering, IICT  
Shahjalal University of Science and Technology,  
Sylhet**

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# 1 Introduction

Welcome to the comprehensive documentation of the First Ladies Hall Dining Management System. This innovative project introduces a user-friendly website designed specifically to cater to the needs of residential students within First Ladies Hall. The system has been developed to enhance the overall dining experience for these students, streamlining various aspects of dining management through a convenient online platform. As we delve deeper into this documentation, you'll gain insights into the features, functionalities, and the positive impact our system aims to bring to the dining routines of the residents.

## 1.1 Background

At the heart of every university, Residential Halls stand as vital hubs, providing students with a nurturing living environment. Within these halls, the management of meal services emerges as a pivotal responsibility. With students hailing from diverse corners of the country, maintaining a balance of nutritious and timely meals becomes imperative, directly influencing their academic performance and well-being.

Recognizing the multifaceted challenges in orchestrating an efficient dining system, our project introduces a transformative approach – the automation of the hall dining system. The core idea revolves around developing a user-friendly website where students and hall supervisors can seamlessly interact with meal services. This automation promises not only simplicity in the order process but also efficient tracking and management of meal data.

To tailor our solution to the unique needs of the First Ladies Hall at Shahjalal University of Science and Technology, we embarked on a comprehensive data collection journey. Through this, we delved into the intricacies of the hall's existing processes, gaining valuable insights that have guided the thoughtful design and development of our automated dining management system.

## 1.2 Benefits and Beneficiaries

This web-based system is a comprehensive solution that extends its advantages to every student enrolled at Shahjalal University of Science and Technology (SUST). The system is thoughtfully designed to accommodate the diverse needs of two primary user roles: Customers, who are the

students utilizing the dining services, and Supervisors, entrusted with ensuring the seamless and efficient operation of the dining system. The user will be this system:-

- Supervisors
- Students (Customer)

### **1.3 List of the performance the system will provide**

Enhancing user experience and streamlining operations, the system offers a range of features to cater to both customers and supervisors:

- **Intuitive Food Category Display:** Customers are provided with a visually appealing interface that allows them to effortlessly browse through a comprehensive list of food categories.
- **Efficient Food Selection:** Customers can seamlessly explore individual food categories, view detailed information about specific food items, and conveniently select single or multiple items through the user-friendly website interface.
- **Transparent Pricing Information:** The system ensures transparency by displaying accurate pricing information for each food item. Customers can easily comprehend item prices and track the total amount to be paid, promoting an informed decision-making process.
- **Invoice Generation:** Customers have the convenience of generating a detailed invoice summarizing their selected food items. This generated invoice serves as a comprehensive record of their order, facilitating a smooth and organized ordering process.
- **Order Facilitation for Supervisors:** Supervisors are equipped with tools to efficiently track all generated invoices. This functionality not only aids in monitoring overall system activity but also enables supervisors to assist customers, ensuring a collaborative and supportive ordering environment.

### **1.4 Stakeholders**

There are two types of stakeholders:

- Dining managements in halls
- Consumers of the dining ( Students )

## 2 Requirement Gathering

The overall purpose of Requirements Analysis is to gather every bit of information needed to design a database that meets the informational needs of an organization.

The requirement gathering methods that we have used in our analysis are:

- *Interviews:* We conducted structured interviews with key stakeholders, including the supervisor and students of First Ladies Hall at Shahjalal University of Science and Technology. The interviews aimed to delve deep into the stakeholders' perspectives, preferences, and expectations regarding the dining order system. Questions were crafted to elicit specific details about the ordering process, desired features, and any pain points experienced.
- *User Observation:* This method involved a direct and unobtrusive observation of users as they interacted with the current order and meal receiving process. By immersing ourselves in the user environment, we gained insights into the practical aspects of their interactions, identifying potential areas for improvement. This observational approach was particularly useful in uncovering implicit user requirements that might not be apparent through interviews alone.
- *Document Analysis:* Through a thorough examination of existing documents such as order logs, databases, and procedural documents, we aimed to understand the current system's workflow, limitations, and strengths. Document analysis provided a historical context, helping us identify recurring issues and user pain points. It also informed us of any procedural constraints that needed consideration in the new system.
- *Surveys:* To gather a broader set of opinions, we designed and distributed surveys to both dining hall managements and consumers (students). The surveys included a mix of closed-ended and open-ended questions, covering topics such as user preferences, satisfaction levels, and specific features desired in the new system. Survey responses provided quantifiable data and valuable qualitative insights.

These methods collectively ensured a comprehensive and multi-faceted approach to requirement gathering, covering user preferences, system interactions, existing workflow analysis, and both qualitative and quantitative feedback from stakeholders.

## 2.1 Functional Requirements

The functional requirements outline the specific capabilities and features that the dining order system must possess to meet the needs of its users. These requirements are designed to ensure the system's functionality aligns with the expectations and preferences identified during the requirement gathering phase:

- **User Authentication:**

- Every user should have a dedicated account to access the system.
- Users must undergo an authentication process to ensure secure and authorized access.

- **User-friendly Category and Item Display:**

- The system should present a user-friendly interface displaying various food categories prominently.
- Within each category, food items should be visually presented in an organized manner, facilitating easy navigation for users.

- **Comprehensive Item List:**

- The system will provide a comprehensive list of all food items offered by the canteen admin.
- Users, particularly students, should be able to easily explore and browse the entire range of available food items.

- **Detailed Food Item Information:**

- The system will display detailed information for each food item, including descriptions, images, and prices.
- Users should have access to a visual representation of the food items, enhancing their decision-making process.

These functional requirements lay the foundation for an intuitive and user-centric dining order system. User authentication ensures security,

while the user-friendly display of categories and items, along with comprehensive item lists and detailed information, contributes to a seamless and informative user experience.

## 2.2 Non-functional Requirements

Non-functional requirements specify the criteria that can be used to judge the operation of a system rather than specific behaviors. These requirements address aspects such as performance, security, usability, and maintainability. For the dining order system, the following non-functional requirements are identified:

- **Performance:**

- The system should provide quick response times to user interactions.
- It should handle concurrent user requests efficiently, especially during peak dining hours.

- **Security:**

- User authentication and data transmission should be encrypted to ensure the security of user accounts and sensitive information.
- Access to certain features (e.g., supervisor dashboard) should be restricted to authorized personnel.

- **Usability:**

- The system should have an intuitive and user-friendly interface to cater to users with varying levels of technical expertise.
- Navigation through food categories and item selection should be straightforward and accessible.

- **Maintainability:**

- The system should be modular and easily upgradable to accommodate future changes or additions to the menu.
- Regular maintenance tasks, such as updating item prices or adding new categories, should be simple and not disrupt the overall system functionality.

These non-functional requirements ensure that the dining order system not only performs efficiently but also meets essential criteria related to security, usability, and maintainability.

## 2.3 Analysis of Existing Documents

### 2.3.1 Document-1: Tracking of Old Meals

Old Meal Date - 80

~~29+29+29+29+29+29+26+~~

~~20+29+26+29+22+6+29+~~

~~29+ 2892~~

~~22+29+29+29+29+28+29+  
6+29+29+29+29+29+29+  
2892 - 802~~

Paid 290

Figure 1: Document-1: Tracking of Old Meals

In Document-1, the manual tracking of old meals is evident. The payable amount is handwritten on the note, and student names are used for

tracking. The manual cutting of balances is observed after dues are received. This process highlights the need for an automated system to streamline and digitize these tracking processes.

### 2.3.2 Document-2: Menu Showcasing

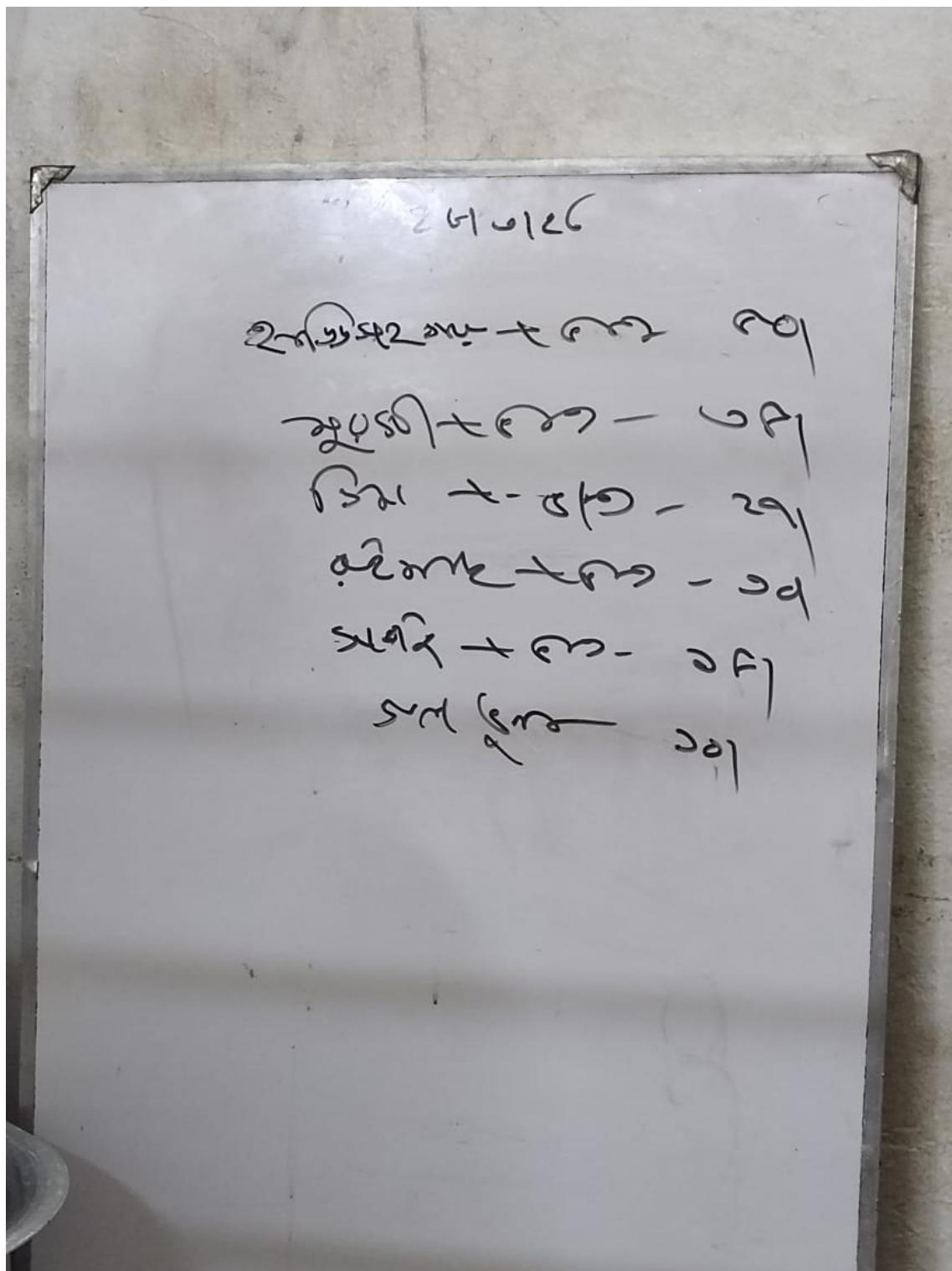


Figure 2: Document-2: Menu Showcasing

Document-2 showcases a manual method of menu presentation. Menus for a specific time are handwritten, featuring packages of two items for a given date, with prices manually written. This emphasizes the need for a digital platform to dynamically showcase menus and prices, allowing for easy updates and modifications.

### **2.3.3 Document-3: Detailed Bills**

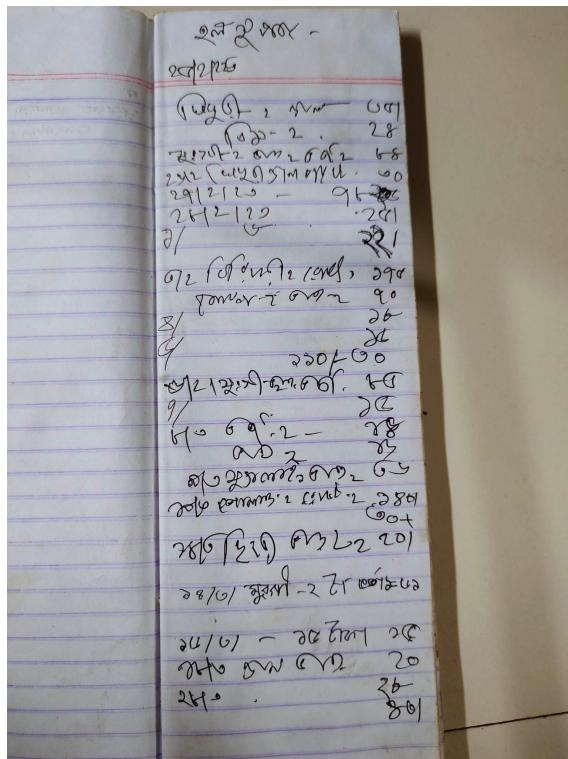


Figure 3: Document-3: Detailed Bills

Document-3 displays detailed bills with item names and dates, manually recorded on a notebook. This manual recording process underscores the importance of transitioning to a digital system that can generate detailed invoices automatically, reducing the risk of errors and providing a more efficient billing process.

## 3 Use Case Diagram

### 3.1 Overall Use Case

The overall use case diagram provides a high-level overview of the primary interactions within the dining order system. The key use cases identified for this system encompass various functionalities catering to both dining hall managements and consumers (students). Here are some of the most important use cases:

- **Registration through the Website:** Users can register on the system by providing necessary details through the website.
- **Login with Registered Email and Password:** Authenticated users can log in to the system using their registered email and password.
- **Manage Item:** Admin or authorized personnel can manage food items, including adding new items, updating prices, and removing items from the menu.
- **Cart Item:** Users can add food items to their virtual cart while browsing the available menu.
- **Food Order:** Users can place orders for selected items from their cart, specifying quantities and any additional preferences.
- **Manage Order:** Supervisors or admin can manage and track incoming orders, ensuring efficient processing and timely delivery.
- **Bill Payment:** Users can make payments for their orders through the system, either online or through other designated payment methods.

The use case diagram visually represents these interactions, showcasing the relationships between actors (users) and the various use cases. Each use case contributes to the overall functionality and efficiency of the dining order system.

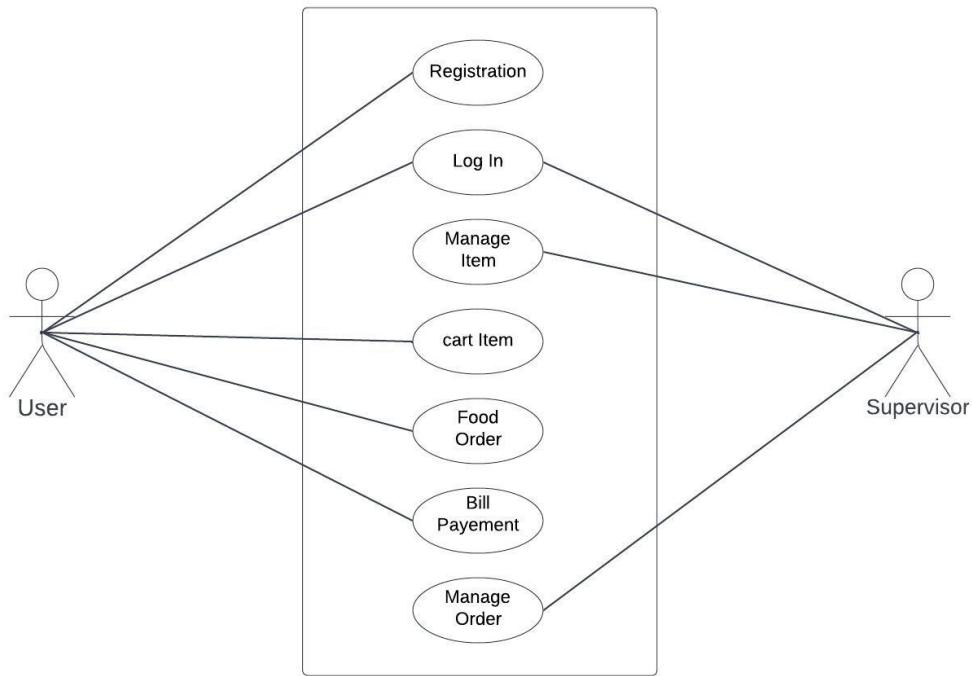


Figure 4: Overall Use Case Diagram

### 3.2 Use Case Diagram for Only User

The use case diagram for users (students) focuses on the key interactions and functionalities available to them within the dining order system. Here are the most important use cases for users:

- **Register and Login:**

- *Description:* Users who are new to the system can register by providing necessary information such as name, email, and password. Registered users can log in using their credentials to access personalized features and account information.
- *Preconditions:* The user needs to have a valid email address, and the system should not already have an account associated with that email.

- **See Available Food:**

- *Description:* Users can browse through a categorized list of available food items, each accompanied by details like name, description, and price. This functionality helps users make informed decisions about their meal choices.

- *Preconditions:* The user must be logged in to access the list of available food items.

- **Food Order:**

- *Description:* Users can add selected food items to their shopping cart, specify quantities, and include any special instructions or preferences. After confirming the order, the system calculates the total cost and updates the user's cart accordingly.
- *Preconditions:* The user must be logged in, and there should be available food items in the system.

- **See Previous Orders:**

- *Description:* Users can view a comprehensive history of their previous orders, including details such as order items, dates, and total amounts paid. This feature provides users with a record of their dining history within the system.
- *Preconditions:* The user must be logged in, and there should be a history of previous orders associated with the user's account.

- **Feedback:**

- *Description:* Users can submit feedback on their dining experiences, including comments, ratings, and suggestions. This information is valuable for the system administrators to enhance the overall user experience and improve the quality of service.
- *Preconditions:* The user must have completed at least one order to provide feedback.

- **Bill Payment:**

- *Description:* After confirming their order, users proceed to the payment stage. Users can make secure payments online or through designated payment methods accepted by the system. Successful payment completes the order process.
- *Preconditions:* The user must be logged in, and there should be items in the user's cart.

- **Change Password:**

- *Description:* Users have the option to change their account password for enhanced security.

- *Preconditions:* The user must be logged in.

The use case diagram visually represents these interactions, showcasing the relationships between users and the various functionalities available to them within the dining order system.

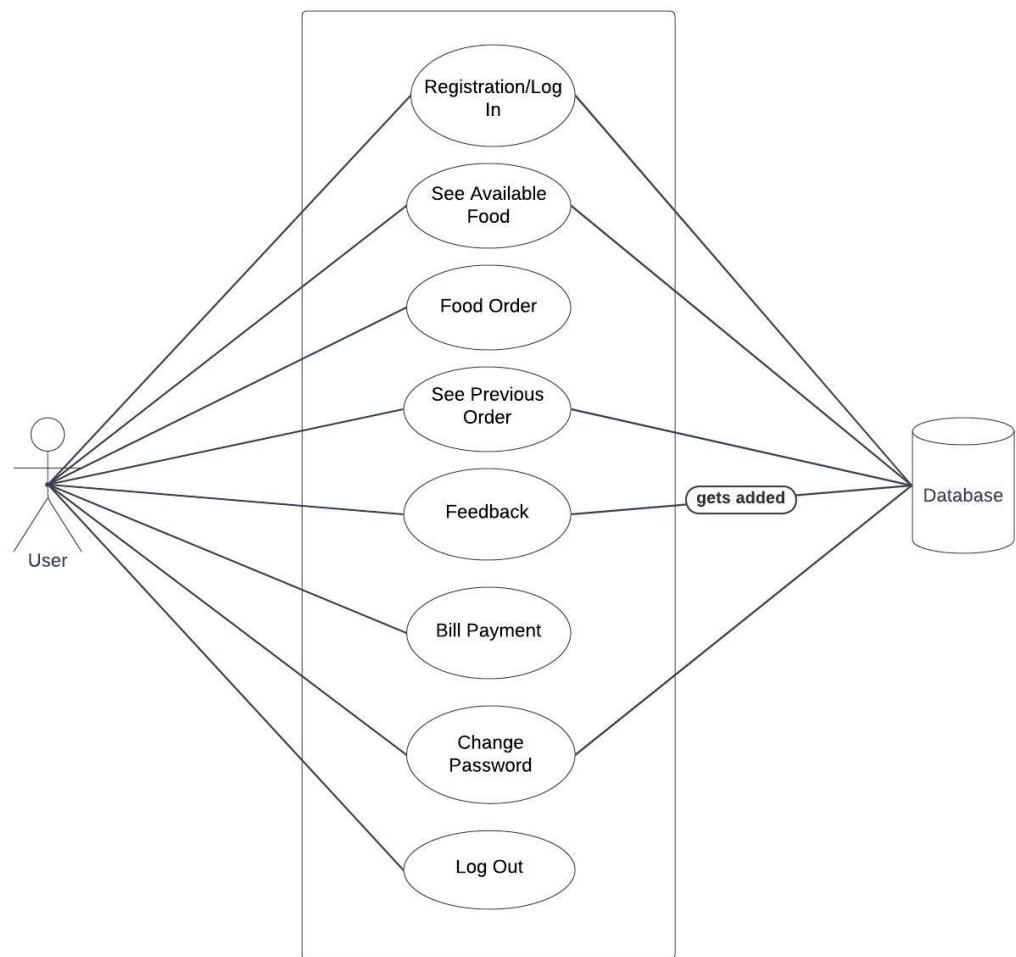


Figure 5: Use Case Diagram for Only Users

### 3.3 Use Case Diagram for Only Supervisor

The use case diagram for supervisors encompasses a detailed set of interactions and functionalities tailored to their role within the dining order system. Here are the expanded descriptions for each use case:

- **Login:** Supervisors initiate the system by logging in with their authorized credentials, gaining access to the supervisor dashboard.
- **Add Item:** Supervisors can contribute to the system's menu by adding new food items. This includes providing comprehensive details such as item names, descriptions, prices, and relevant images.
- **Update Item:** To maintain an up-to-date menu, supervisors can modify existing food items. This involves the ability to update prices, descriptions, or any other relevant information associated with the menu items.
- **Delete Item:** Supervisors have the authority to remove food items from the menu. This functionality is useful for discontinuing certain items, updating the menu based on availability, or responding to changing preferences.
- **Process Order:** Supervisors play a crucial role in processing incoming orders. This involves ensuring that the selected items are available, coordinating with kitchen staff, and overseeing the order fulfillment process to guarantee customer satisfaction.
- **View Order:** Supervisors can view the details of all incoming orders. This includes information such as selected items, quantities, customer details, and the status of each order. This feature aids in effective order management.
- **Create Invoice:** For each order, supervisors have the responsibility to generate detailed invoices. These invoices summarize the selected items, quantities, and the total amount to be paid. This ensures transparency and accuracy in the billing process.
- **View Transactions:** Supervisors can access a comprehensive record of all transactions within the system. This includes a history of orders, payments, and any adjustments made. The ability to view transactions provides valuable insights into the financial aspects of the dining order system.

The use case diagram visually represents these detailed interactions, illustrating the relationships between supervisors and the diverse functionalities available to them within the dining order system.

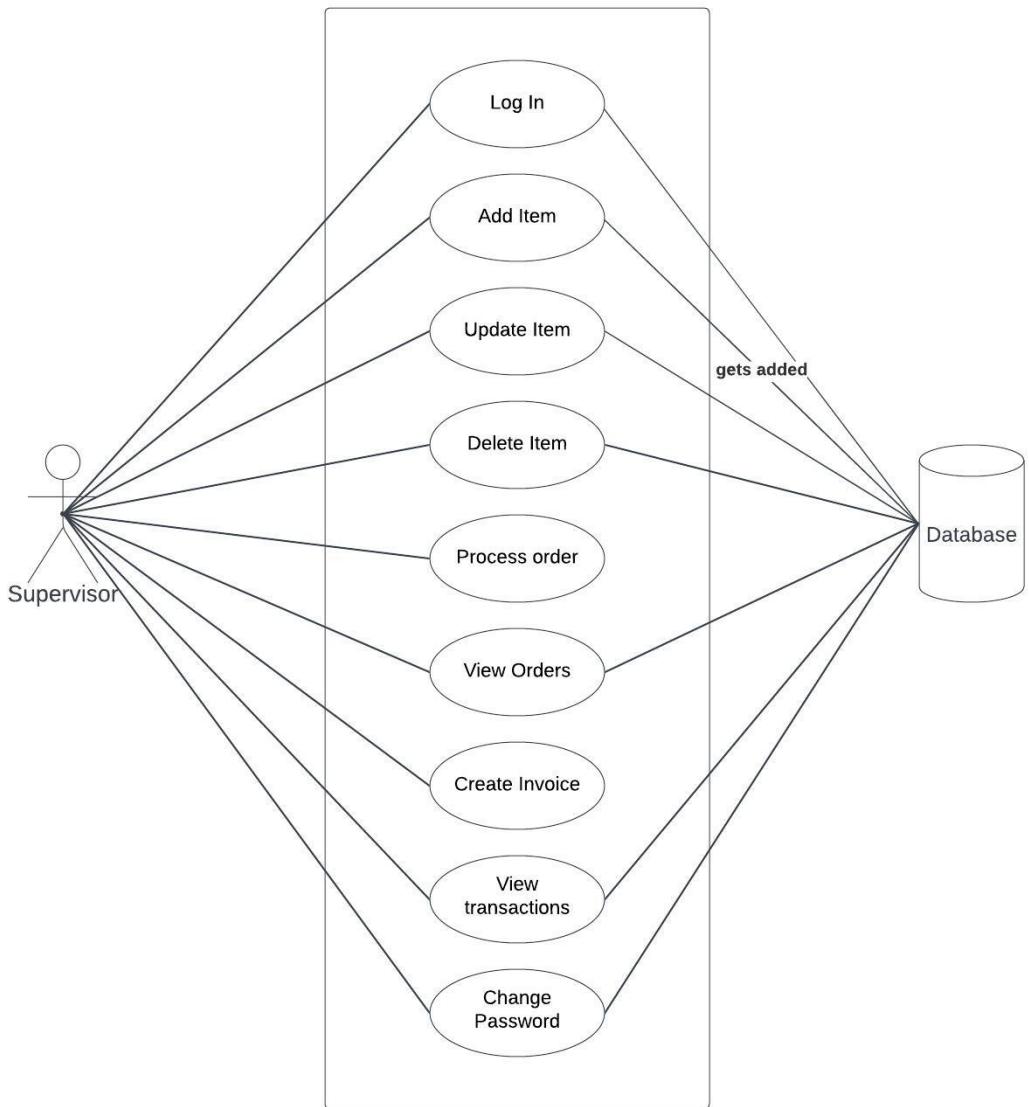


Figure 6: Use Case Diagram for Only Supervisor

## 4 Data Flow Diagram

We have included three levels of data flow diagrams. These are:

- Level 0
- Level 1
- Level 2

These three levels has even more layers for better modulation.

### 4.1 Level 0 Data Flow Diagram

Level 0 DFD of our project is given below:

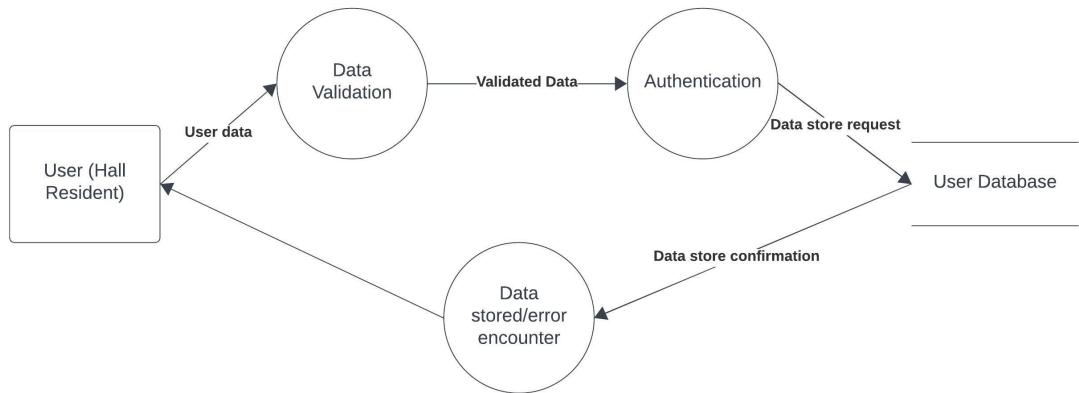


Figure 7: Level 0 of Data Flow Diagram

## 4.2 Level 1 Data Flow Diagram

Level 1 DFD of our project is given below:

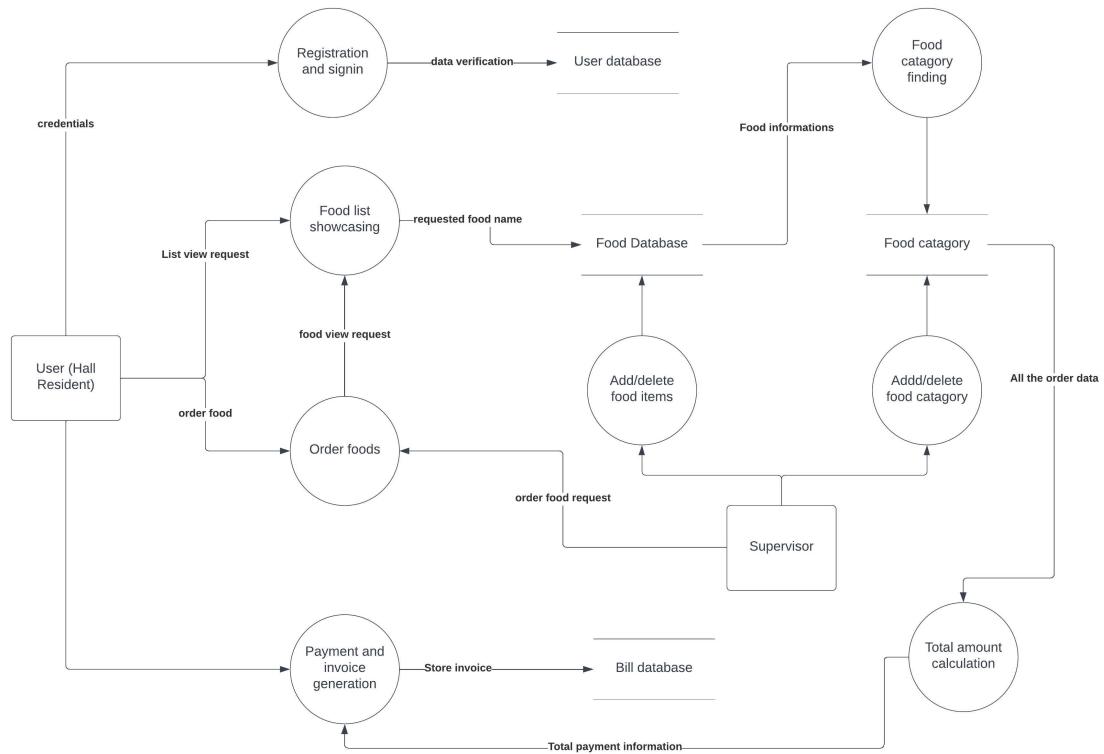


Figure 8: Level 1 of Data Flow Diagram

### 4.3 Level 2 Data Flow Diagram

Level 2 DFD of our project is divided into two parts which are given below:

- Food items management by supervisor module
- Food order system module

#### 4.3.1 Food items management by supervisor module

One of the Level 2 of DFDs is Food items management by supervisor module. This is given below:

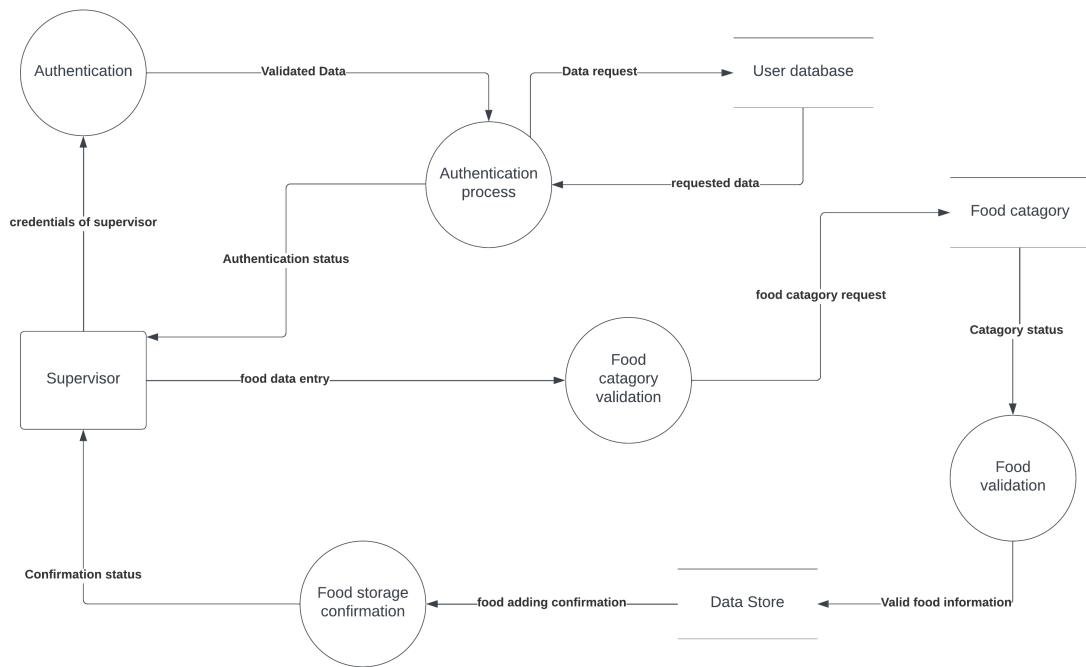


Figure 9: DFD Level 2: Food items management by supervisor module

#### 4.3.2 Food order system by user module

One of the Level 2 of DFDs is Food order system by user module. This is given below:

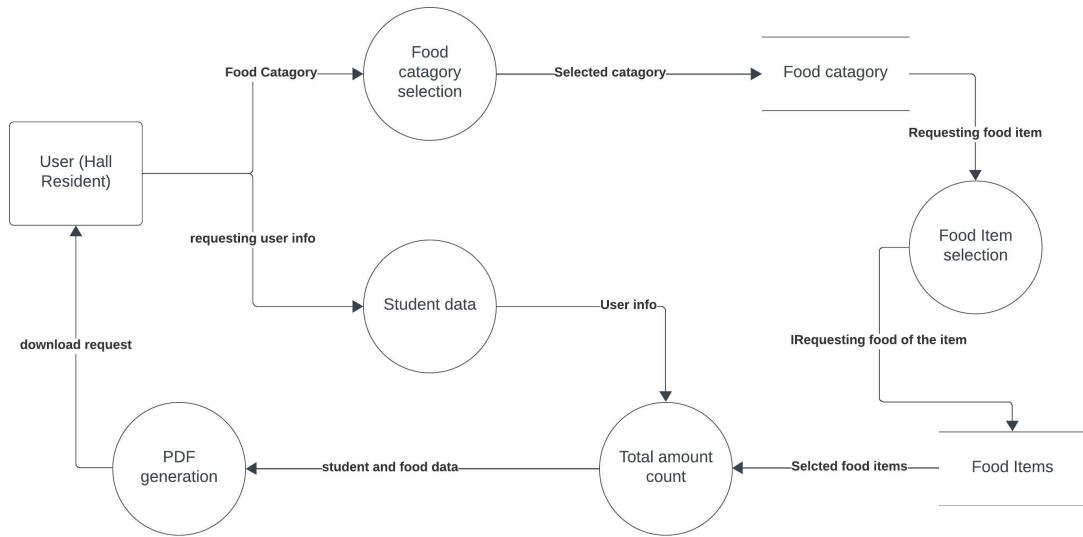


Figure 10: DFD Level 2: Food order system by user module

## 5 ER Diagram

We have four strong entity:

- User
- Order
- Food category
- Food

and two weak entity:

- Supervisor
- Feedback

### 5.1 User Entity

The attributes of this entity are given below:

- username
- email
- phone no
- registration number
- department name
- password

### 5.2 Order Entity

The attributes of this entity are given below:

- username
- email
- phone no
- registration number
- payment method
- payment amount
- items

### **5.3 Food Category Entity**

The attributes of this entity are given below:

- category id
- name
- description
- image

### **5.4 Food Entity**

The attributes of this entity are given below:

- category id
- food id
- name
- image
- description

### **5.5 Supervisor Entity**

The attributes of this entity are given below:

- email
- password

### **5.6 Feedback Entity**

The attributes of this entity are given below:

- email
- comment

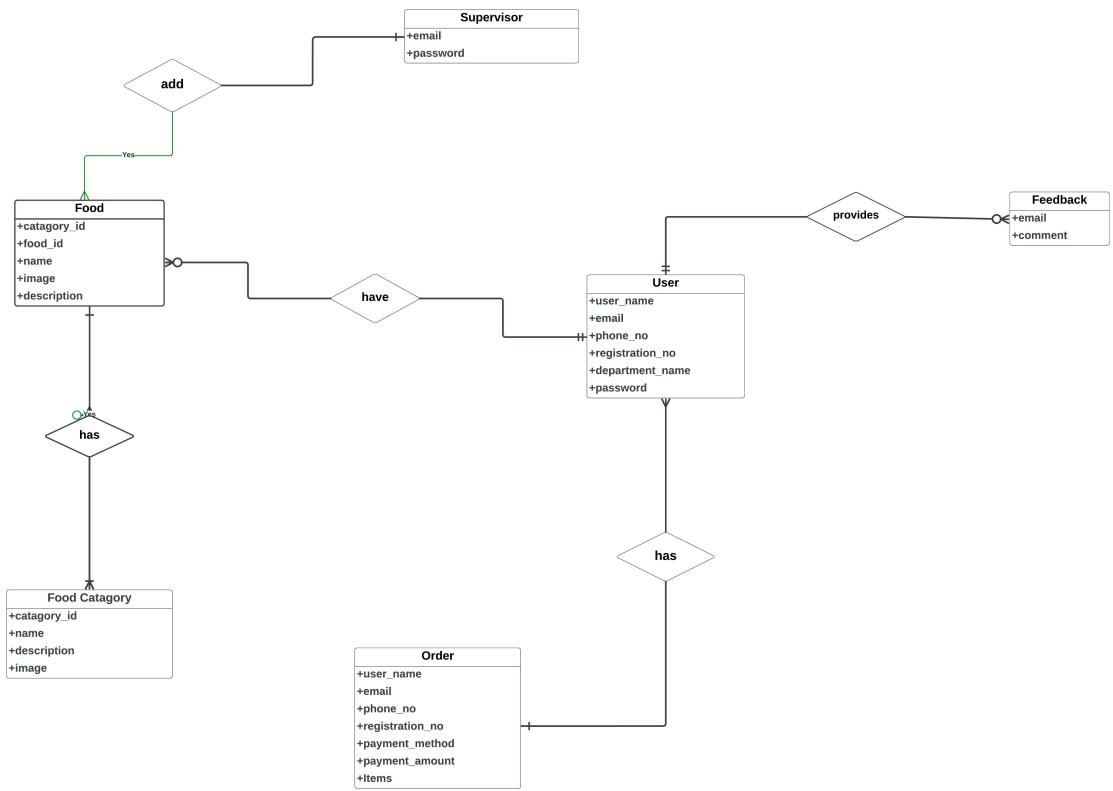


Figure 11: ER Diagram

## 6 UI Design

We have strived to create a user-friendly UI, incorporating Bangla to enhance user engagement and eliminate language barriers.

### 6.1 Front Page

The Front Page serves as the gateway to the dining order system, presenting an inviting and intuitive interface for users.



Figure 12: Front Page - 1



## আমাদের স্বক্ষে জানুন

শহজালাল বিজ্ঞান ও প্রযুক্তি বিশ্ববিদ্যালয়ের মধ্যে শিক্ষার্থীদের জন্য তৈরীকৃত প্রথম হল হলো জাহানারা ইমাম হল, যাতে প্রতি ঘরে অসংখ্য নিয়ন্ত্রণী সিটি প্রেমে আসে।

এসব শিক্ষার্থীদের সুস্থিতি ও সাংস্কৃতিক পরিচর্চার জন্য প্রতিমিন প্রয়োজন নির্দিষ্ট পরিমাণ কানাসুি ও শরীরিক চার্চার। আদের আদ্য চাহিয়ে পুরণের মাধ্যমে যেখা বিকালের সুস্থিতি করে দেওয়ার জন্যই বিশ্ববিদ্যালয়ের কর্তৃপক্ষ প্রতিষ্ঠা করে জাহানারা ইমাম হল ভাইস্ন। এখানে নিতৃ খাবার-দানারের বাবস্থা করা হচ্ছে সম্পূর্ণ ঘরোয়া পদ্ধতিতে বাইরের কেজল খাবার ছাড়াই।

## আমাদের ডাইনের সময়সূচী

### সকালের নাস্তা



Figure 13: Front Page - 2



## আমাদের ডাইনের সময়সূচী

### সকালের নাস্তা

সকাল ০৭:০০ ঘটিকা হতে দুপুর ১২:০০ টা পর্যন্ত সকালের নাস্তা পাওয়া যাবে



### দুপুরের খাবার

দুপুর ১২:০০ ঘটিকা হতে বিকাল ০৫:০০ টা পর্যন্ত দুপুরের খাবার পাওয়া যাবে



### বিকালের নাস্তা

বিকাল ০৫:০০ ঘটিকা হতে সন্ধিয়া ০৭:০০ টা পর্যন্ত বিকালের নাস্তা পাওয়া যাবে

Figure 14: Front Page - 3

## 6.2 Register Page

The Register Page allows users to create accounts with ease, streamlining the onboarding process.

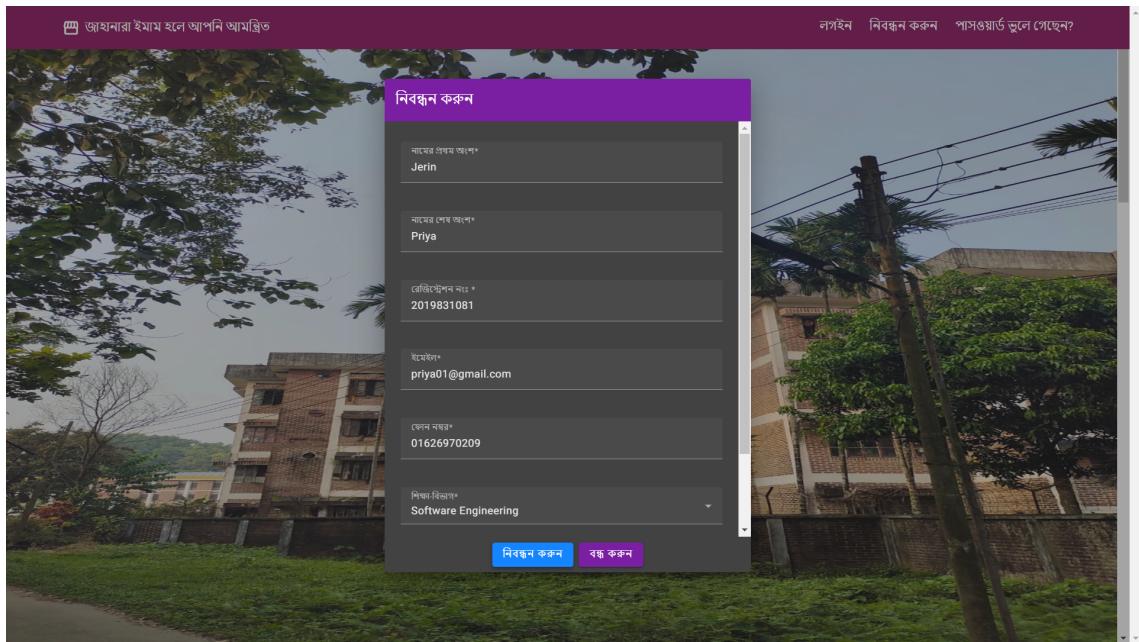


Figure 15: Register Page for users

### 6.3 Login for Students

The Login Page for students facilitates secure access to their accounts, ensuring a seamless user experience.

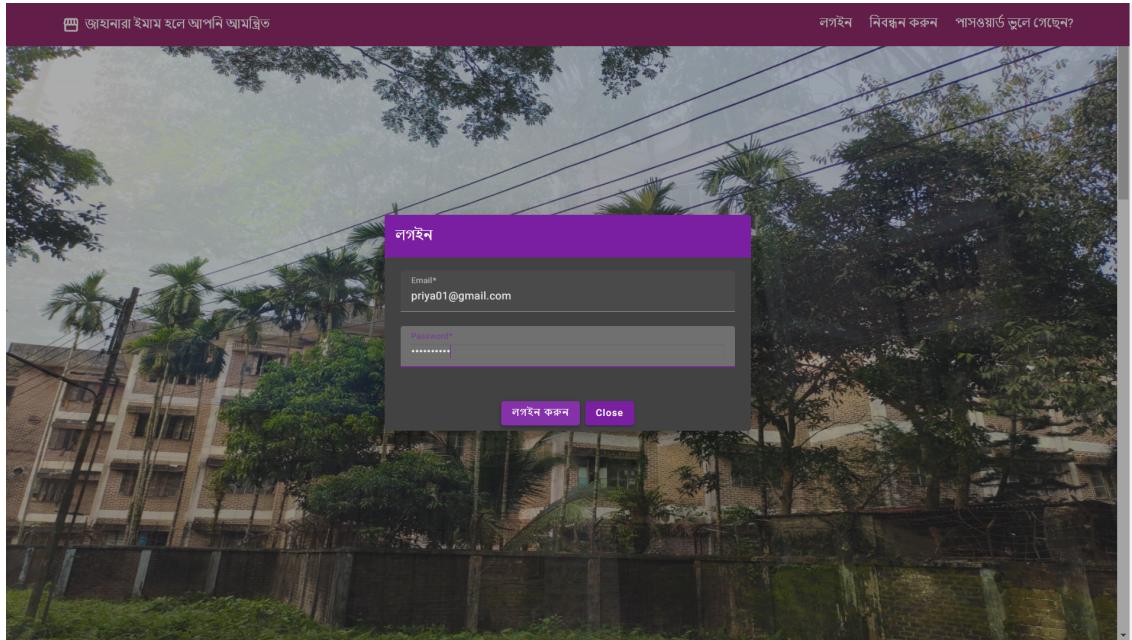


Figure 16: Login for students

### 6.4 Dashboard

The Dashboard provides users with a centralized and organized view of relevant information and actions.

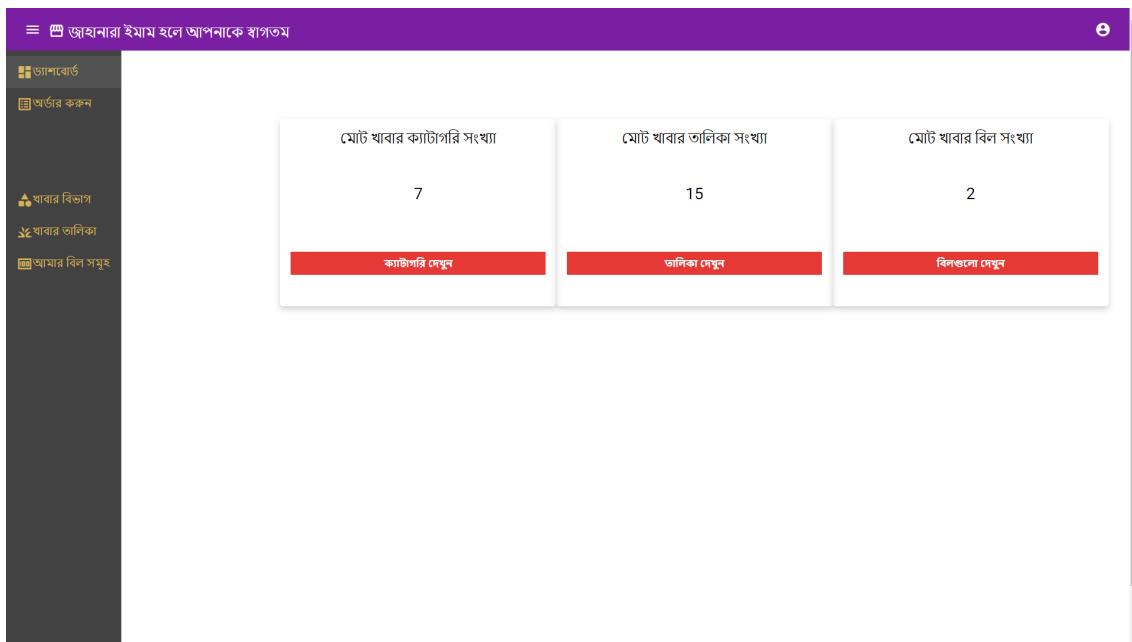


Figure 17: Dashboard

## 6.5 Food Category Page

The Food Category Page allows users to explore and navigate through various food categories effortlessly.

Food Categories		
Name	Image	Description
পুরী		গরম ও ঠাণ্ডা সকল ধরণের পুরীয়ের সমাহার
ফাস্টফুড		বাহ্যিকভাবে মান সমন্বিত রেসে ঘরে তৈরী ফাস্টফুড
মালে		যানান ও চেস মালের আইটেম
মাছ		চেস ও বাহ্যিকভাবে মান নিয়ন্ত্রণে তৈরী মাছের আইটেম
রাষ্ট্র		চেজেলমুক্ত চানের টোরি আইটেম
সরবজি		আজা ও চেস সরবজির খাবার
সালাদ		বিভিন্ন ধরণের সরবজি ও ফসের সমন্বয় সালাদের খাবার

Figure 18: Food Category Page

## 6.6 Food Items Page

The Food Items Page presents a visually appealing display of available food items, making it convenient for users to make selections.

Food Items				
Name	Category Name	Image	Description	Price
বার্গার	ফাস্টফুড		অর্বাচ চিজ বার্গার, চিকেন প্যাটি এবং এক্সপ্রেস চিজ	40
পিকাচা	ফাস্টফুড		অর্বিগানো, টেম্পেটে ও ব্যাকনের পিকাচা টাইপ মজজুরের চিজ	60
আলু-পেপে ভাজি	সরবজি		আলু ও পেপের মিশনে তৈরী ভাজি	12
চিড়স ভাজি	সরবজি		চেশ চিড়সের ভাজি	10
সাদা ভাত	রাইস		প্রেইন সাদা চিকন চানের ভাত	20
পোর্কাশ	রাইস		প্রেইন কানার্জির চানের পোর্কাশ	35

Figure 19: Food Items Page

## 6.7 Food Order Page

The Food Order Page provides users with a step-by-step process for placing orders, ensuring a smooth and intuitive ordering experience.

জ্ঞাননারা ইমাম হলে আপনাকে খাগতম

অর্ডারসমূহ যানেজ করন

সর্বমিট করন এবং বিল ডাউনলোড করন

খাদ্যের বিভাগ নির্বাচন করন:					
নাম(Name)* Priya	ইমেইল(Email)* priya01@gmail.com	ফোনযোগের নম্বর* 01626970209	মুদ্যপরিশেষ পছতি* ক্যাপ্চ		
আবার বিভাগ নির্বাচন করন:	সামুদ্রিক পদক্ষেপ	মূল্য(Price)* 20	পরিমাণ(Quantity)* 1	মোট: 20	সর্বমিট পরিমাণ: 0
<b>যোগ করুন</b>	<b>Add Order</b>				
নাম	আবার বিভাগ	মূল্য	পরিমাণ	মোট	টিলিট করন
সামুদ্রিক সবজি	চেচেস ভাজি	10	1	10	

Figure 20: Food Order Page: Before Ordering

জ্ঞাননারা ইমাম হলে আপনাকে খাগতম

অর্ডারসমূহ যানেজ করন

সর্বমিট করন এবং বিল ডাউনলোড করন

খাদ্যের বিভাগ নির্বাচন করন:					
নাম(Name)* Priya	ইমেইল(Email)* priya01@gmail.com	ফোনযোগের নম্বর* 01626970209	মুদ্যপরিশেষ পছতি* ক্যাপ্চ		
আবার বিভাগ নির্বাচন করন:	সামুদ্রিক পদক্ষেপ	মূল্য(Price)* 10	পরিমাণ(Quantity)* 1	মোট: 10	সর্বমিট পরিমাণ: 0
<b>যোগ করুন</b>	<b>Add Order</b>				
নাম	আবার বিভাগ	মূল্য	পরিমাণ	মোট	টিলিট করন
সামুদ্রিক সবজি	চেচেস ভাজি	10	1	10	
আল ফুল	মাংস	30	1	30	
চেচেস ভাজি	সবজি	10	1	10	

Figure 21: Food Order Page: After Adding Order

## 6.8 Invoice

The Invoice Page provides users with a clear and detailed summary of their orders, aiding in transparent and accurate billing.

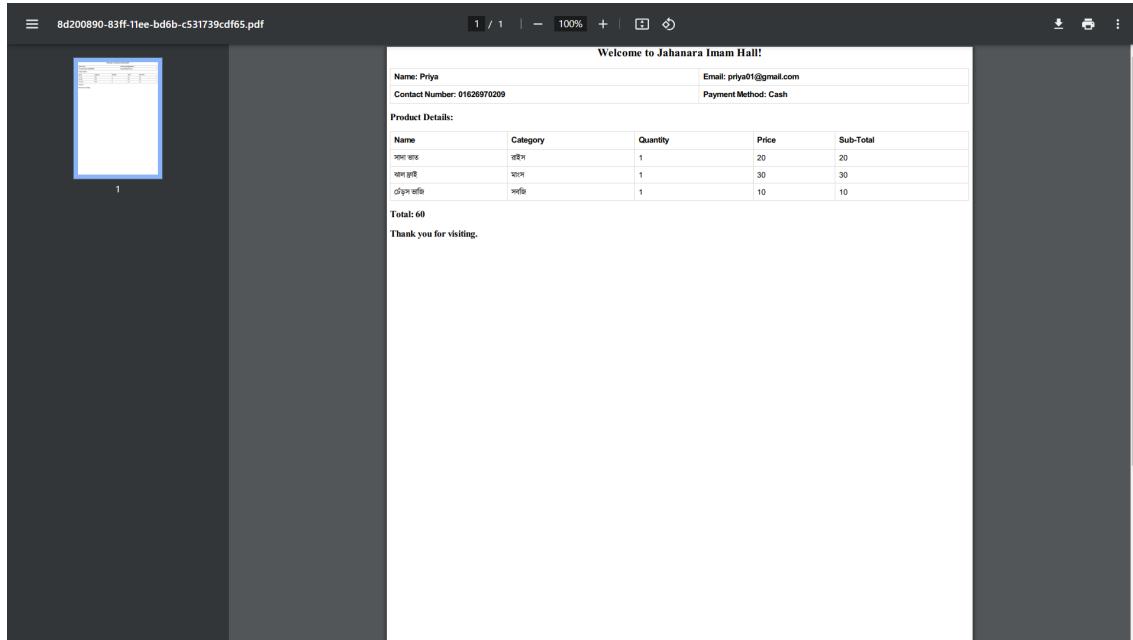


Figure 22: Invoice

## 6.9 Supervisor Login Page

The Supervisor Login Page grants access to supervisors, allowing them to manage food items and oversee the ordering process.

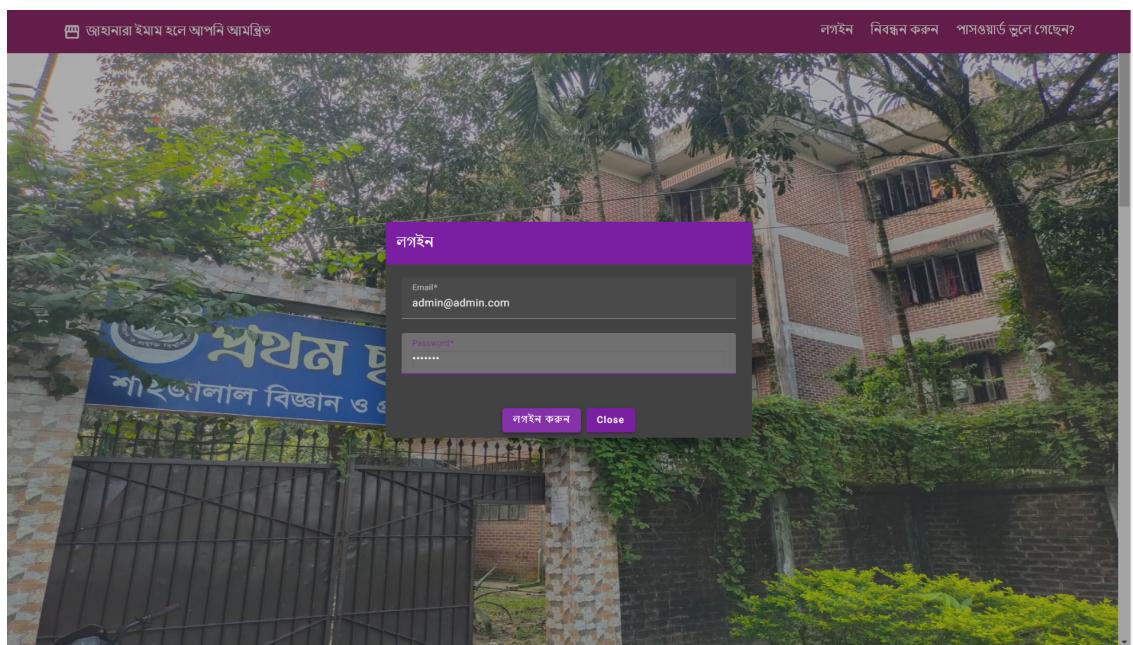


Figure 23: Supervisor Login Page

## 6.10 Add Food Page

The Add Food Page empowers supervisors to contribute to the system's menu by adding new food items.

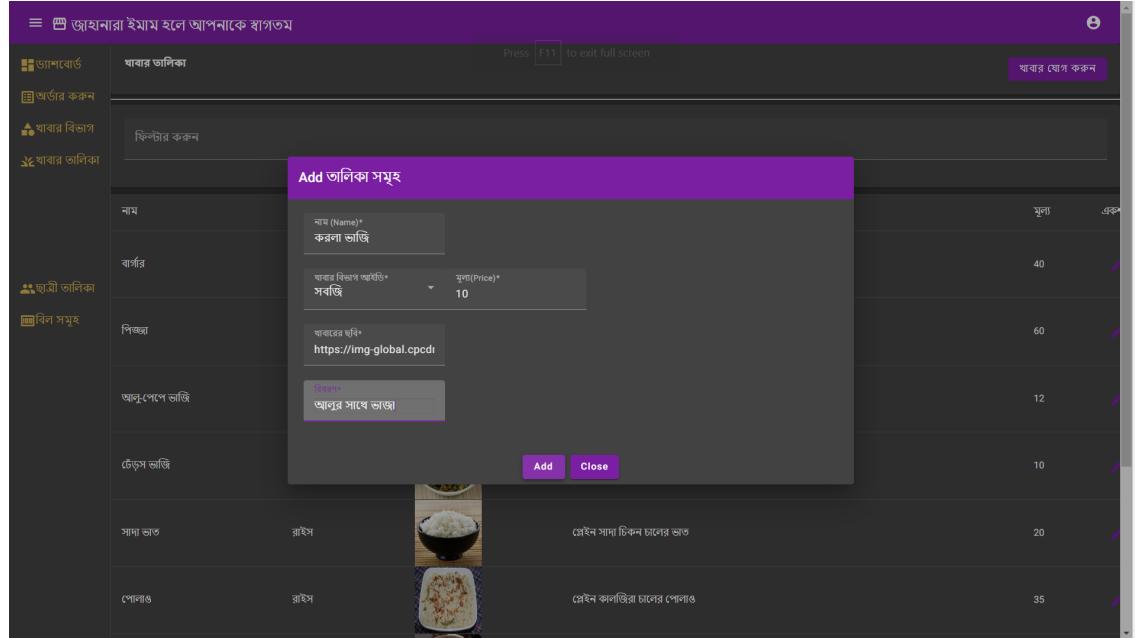


Figure 24: Add Food Page

## 6.11 Students List Page

The Students List Page provides supervisors with an organized view of registered students, facilitating efficient management.

Name	Email	Phone
Promi Mojumder	moju@gmail.com	01234567892
Sanzida Afrin	sanzida@gmail.com	01234567897
Sanjana Afrin	sanjana@gmail.com	01234567891
Sadia Islam	sadia@gmail.com	01234567893
Amaya Rahman	amaya@gmail.com	01234567893
Anika Jaman	anika@gmail.com	01234567895
Bonna Mirza	bonna@gmail.com	01234567896
Chameli Banu	chameli@gmail.com	01234567897
Mitu Chowdhury	mitu@student.sust.edu	01234567898
Mahin Ferdous	mahin@gmail.com	01234567899
Karima Hossain	karima@gmail.com	01234567890
Bijoti Saha	bijoti@gmail.com	01234567891

Figure 25: Students List Page

## 6.12 Bills List Page

The Bills List Page offers supervisors insights into the financial transactions and billing history within the system.

নাম	ইমেইল	বোগাখান নথর	পেমেন্ট পদ্ধতি	মোট পরিমাণ	একশন-সমূহ
Priya	priya01@gmail.com	01626970209	Cash	60	
Priya	priya01@gmail.com	01626970209	Cash	60	
Sanzida	sanzida@gmail.com	01234567891	Cash	65	
Priya	priyajerin9@gmail.com	01795809737	Cash	405	

Figure 26: Bills List Page

## 6.13 Forget Password

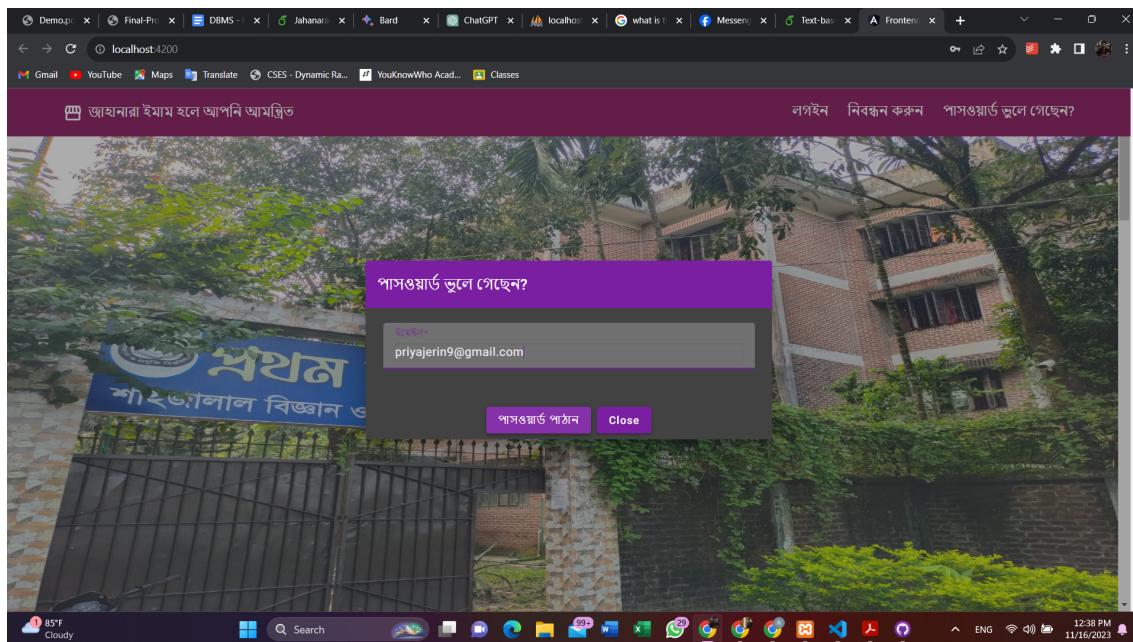


Figure 27: Forget Password - 1

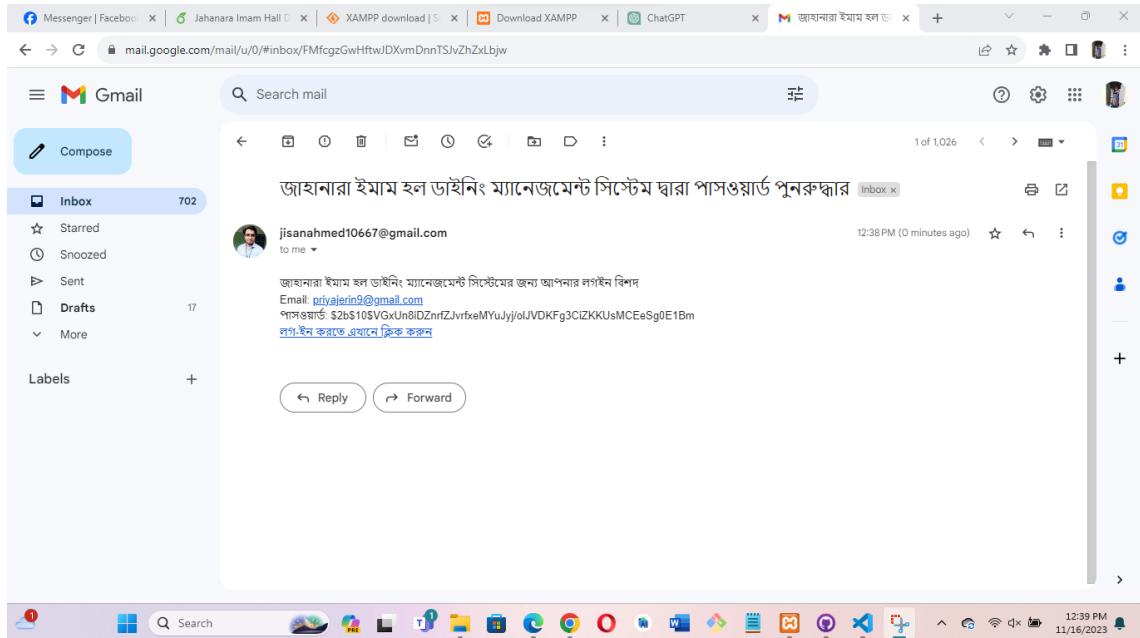


Figure 28: Forget Password

If any registered user forget password, they can use this feature to retrieve that providing email of that account. After providing the mail, user can find the password, as well as can find a link which will redirects to the landing page of the website.

## 6.14 Change Password

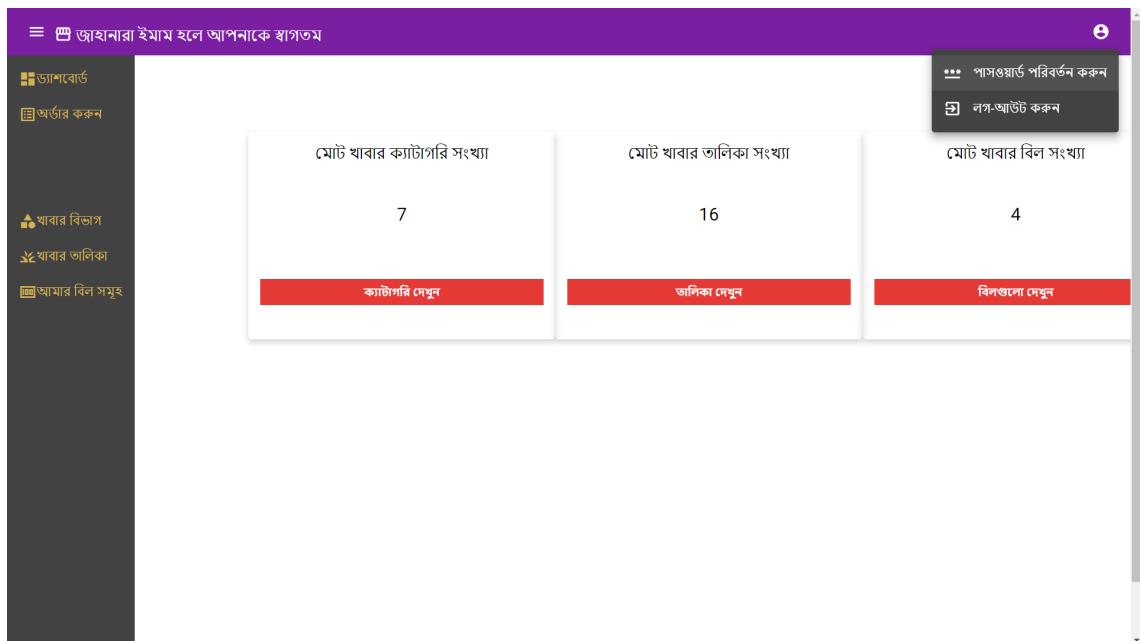


Figure 29: Change Password - 1

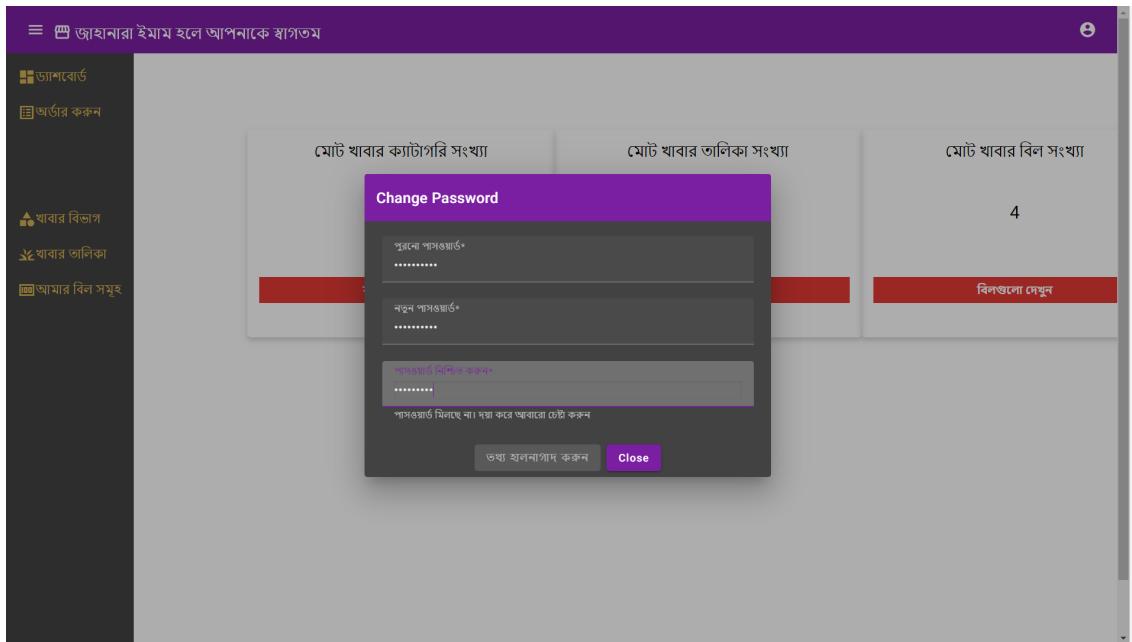


Figure 30: Change Password - 1

Users can change the password using this feature. They have to give the old password for verification, as well as a new password to change the previous one.

## 7 Database Schema Design

In our Database there are 7 tables with connection of one to many between a lot of them and each table has some unique columns and foreign keys to establish the connections between the tables.

The database or table diagram is added below for easier understanding about the tables and the attributes present in all the tables :

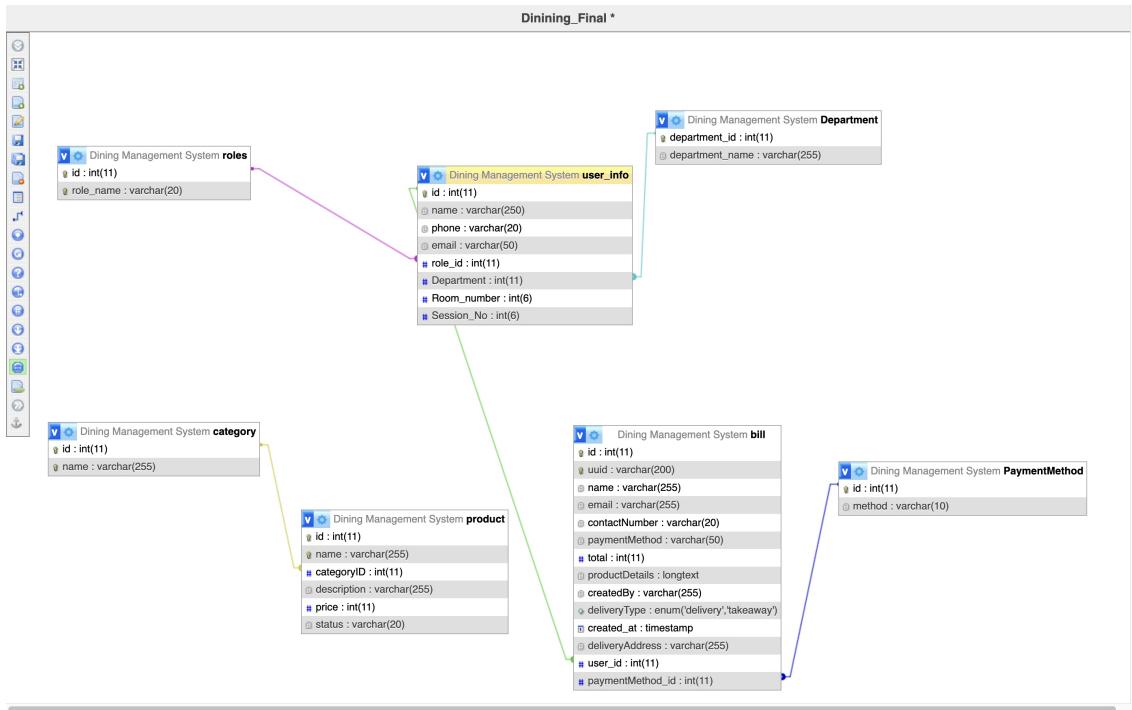


Figure 31: Database Design

## 8 Implementation

The implementation of our project involved the use of various technologies and languages, providing a robust and efficient system. The primary languages utilized in our project include:

- **JavaScript:** Used for client-side scripting, enabling dynamic and interactive user interfaces.
- **HTML:** The standard markup language for creating the structure of web pages.
- **CSS:** Employed for styling and layout, enhancing the visual presentation of the user interface.
- **TypeScript:** Used to enhance JavaScript by adding static typing, improving code maintainability and scalability.
- **EJS (Embedded JavaScript):** Utilized for server-side templating, allowing dynamic generation of HTML content with JavaScript logic.
- **SCSS (Sassy CSS):** Used as a preprocessor scripting language for CSS, adding features such as variables, nested rules, and mixins to enhance the styling process.

Additionally, we incorporated various technologies to streamline the development process and enhance the functionality of the project:

- **Angular:** A powerful front-end web application framework, providing a structured and efficient way to build dynamic single-page applications.
- **Node.js:** Used for server-side scripting, allowing the execution of JavaScript code on the server, enhancing the overall performance of the application.
- **JSON Web Token (JWT):** Employed for secure transmission of information between parties, enhancing authentication and authorization processes.

For data storage and retrieval, we utilized the following technology:

- **phpMySql:** A widely used relational database management system, chosen for its reliability and efficiency in handling structured data.

The actual implementation code of our project, including EJS and SCSS components, is hosted on GitHub. This platform provides a transparent and collaborative environment for tracking work progress, facilitating version control, and incorporating various technologies to ensure a comprehensive and feature-rich dining order system.

For further details and access to the implementation code, you can refer to our GitHub repository.

## 9 Testing

In the development lifecycle, we meticulously conducted unit testing to rigorously evaluate the functionality and reliability of the implemented modules. This phase primarily focused on verifying the correctness of backend routes, ensuring that they accurately handled requests and maintained proper synchronization with the database.

Our testing process leveraged the powerful "Postman" tool, a versatile platform designed for API development. Postman allowed us to create and execute comprehensive API tests, enabling us to validate the following key aspects:

- **Backend Routes:** Thorough testing was performed to confirm that all API endpoints were correctly configured and that requests were processed in accordance with the system's specifications. Each endpoint was subjected to various input scenarios to assess its robustness and ability to handle diverse requests.
- **Data Synchronization:** The tests scrutinized the seamless flow of data between the application and the database. It was essential to ensure that data transactions occurred without errors, maintaining the integrity of the system. Data consistency and accuracy were thoroughly examined to prevent potential issues related to data synchronization.

While unit testing provides crucial insights into individual component behavior, it's essential to highlight that comprehensive system testing with live users is an integral part of the testing strategy. This broader testing phase will be initiated when the entire system is integrated, allowing us to evaluate the following aspects:

- **System Performance:** Assessing the overall performance and responsiveness of the system under varying loads and conditions. Stress testing will be conducted to identify the system's limits and potential bottlenecks, ensuring it can handle the expected user traffic.
- **User Interactions:** Validating that user interactions with the interface are smooth, intuitive, and free of any unexpected behaviors. Usability testing will be performed to gather feedback on the user interface, aiming to enhance the overall user experience.

- **End-to-End Functionality:** Ensuring that all components work seamlessly together to provide a complete and reliable dining order system. Integration testing will focus on verifying that different modules collaborate effectively, and end-to-end scenarios will be tested to simulate real-world usage.

As the project progresses to the system testing phase, additional testing efforts will be undertaken to identify and address any potential issues. This thorough testing approach aims to deliver a robust, reliable, and user-friendly dining order system.

## 10 Conclusion

This website will help the hall resident students to watch and order meals more easily as well as help the supervisor to coordinate the meal system for efficiently. Although we tried our best to make the system error free and user friendly, there are still some limitation exist in the website.