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Canteen Automation System

A Software Engineering project submitted By –

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To Honorable
MASUM BILLAH SIR
Software Engineering

The project will be Evaluated for the following Course Outcomes

CO3: Choose appropriate software engineering model in a software development environment	Total Marks
Content Knowledge [5Marks]	
Argumentation [5Marks]	
Evidence of Argumentation [5Marks]	
Completeness, Spelling, grammar and Organization of the Answer [5Marks]	
CO4: Explain the roles and their responsibilities in the software project management activities	Total Marks
Project Background Analysis [5Marks]	
Project Role identification [5Marks]	
Responsibility Description [5Marks]	
Completeness, Spelling, grammar and Organization of the Answer [5Marks]	

1. PROBLEM

1.1 Background to the Problem

PROBLEM STATEMENT:

The Challenges encountered by the manual system in canteens is efficiency and customer satisfaction. The experience of ordering in most fast food canteens is not pleasant for customers. Customers have to make long queues before placing the order and when the order is placed they have to wait near the counter until the order is prepared. Another problem is efficiency that food canteen should maintain in their standard operations and keep with the quality of their product and services no matter how much crowd is present in the canteen but they have to maintain efficiency as well as the quality of the product. However, we think that there is one issue concerning the traditional way to order food in canteens. The major issues are as follows verbal communication between cashier and customer or we can say telephonic.

Communication:

The verbal communication between two parties for placing an order and the information about the bill should also result in error means error also occurs in understanding what the person wants to say and especially in busy hours in canteens. When the place is very crowded and noisy, miscommunications are common. The problem is even worse if the cashier and/or the customers do not speak the native language.

Food customization:

The ability to customize food has been a crucial business strategy in the food industry since McDonald's slogan "I'm Loving' it" for the campaign. Food customization allows some flexibility for customers who have a special request (less ice for soda, no pickles etc.) and is especially necessary for customers who are allergic to some ingredients. Currently, the cashier has to memorize these requests since the existing system does not support any means of recording such requests. The result is that the requests are forgotten or miscommunication to the cook.

Menu display:

Today's competition between food canteens motivates each canteen to launch new items on their menus on a more frequent basis. However, the menu in more canteens usually

attached to a wall behind the counter and the customer are not aware of that new item because the menu is not up-to-date. Furthermore, not all item on the menu list has a graphical illustration to help customers to take Decision easily what they want.

1.2 Solution to the Problem

Nowadays people are busy with their professional life. So, they don't want to spend more time in the canteen and waiting for the waiter to take their order. Many people visit the canteen at lunch time. Sometimes they have limited time to take lunch. Here, this software helps them to save time and order a meal quickly. They don't need to call the waiter again and again. With the software, customers can be informed about the ordered food that whether it is cooked or not or how much progress is done already. This software will be very helpful for our customer and we will reach our business goal.

PURPOSE OF PROJECT:

Canteen Automation System is the system where customers order their food and receive food in the canteen without any delay as they can directly go and collect what they ordered without waiting for a turn or waiting time. This system aims to accelerate customer orders and customer order system used by employees to accept customer order.

The purpose of the system is to develop a simple Canteen automation Software and implement it, which later will be used for a web-based application.

The proposed "Canteen Automation System" is economically feasible because

- The system requires very fewer time factors as compared to the manual system.
- The system will provide a fast and efficient automated environment instead of slow and error-prone manual system, thus reducing both time and manpower spent on running the system.
- The system will have a GUI interface and very less user training is required to learn it.

The Objectives of this project is:

OBJECTIVE:

Our objective is to make a platform-independent application to maintain a database of all orders ordered from various sources and all the different services required by each of them. Established canteen automation practices should provide the needed connectivity and accountability between those two units, and when managed properly, enhances the effectiveness of both operations.

- To order food rapidly
- To make it convenient for people who have limited time
- Cost reduction
- Reduced paperwork
- Computerized Oder and billing system

Advantages:

- Completely automated online ordering of food in a canteen.
- Order can be placed using personal android phones.
- Food ordering pages that look and feel exactly the same as the existing restaurant website.
- User can also order a Special Combo Box which contains multiple food items.
- Food ordering pages hosted on a secure and special server so no risk of customers getting redirected to servers where competitors' websites are listed.

- Developed using the latest website programming. Protocols for minimum server loads and ultra-fast loading and processing.
- Simple user-interface Admin Panel for creation and configuration of menu groups, menu items, etc.

- Built-in facility to set modifiers on different menu items
- Facility to create modifier groups, individual modifier items and assign modifier items into different groups
- Single and individual Admin Panel and login for each Canteen
- Detailed summary of orders placed with the option to search orders, update order status, print orders, etc.
- Various reports to view total sales, details of registered members with the facility to print the report.

We think there are some solutions to the aforementioned problem. From the internet, we saw a solution to the same problem was solved by an institution name GYAN GANGA INSTITUTE OF TECHNOLOGY & SCIENCES. There we can see that they used the RAD model to solve the problem. But these problems can also be solved by other agile models as well.

2. SOLUTION DESCRIPTION

2.1 System Features

Functional Requirement:

Users of the canteen automation system, namely canteen customers, must be provided with the following functionality:

- Create an account.
- Manage their account.
- Log into the system

- Navigate the canteen's menu.
- Select an item from the menu.
- Customize options for a selected item.
- Add an item to their current order.
- Review their current order.
- Remove an item/remove all items from their current order.
- Provide payment details.
- Place an order.
- Receive confirmation in the form of an order number.

Quality attributes:

Time: The elapsed time between the submission of the order process between the customer and cashier in a canteen should be as minimum as possible.

User-friendly: Our canteen automation system should be more users friendly. The user interface should be kept simple and uncluttered. Since the different types of people will interact with this process so our project should be very easy for them to understand.

Flexibility: Our project should be so flexible that whenever we want to make changes in it very easily it can be done.

Extensibility:

It should be able to accommodate the variations like:

- The different order should be handled easily.

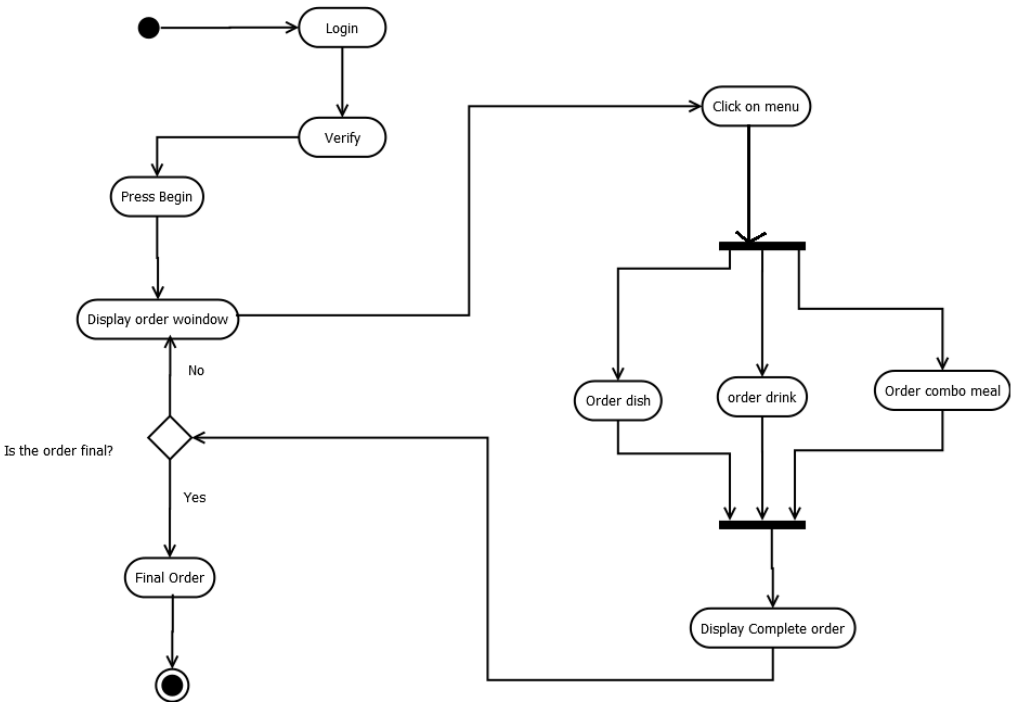
- It should be an option for cash on delivery, pay through card between customer and canteen.

Portable: Our project should be portable on any platform and available on websites easily and at a faster speed than others.

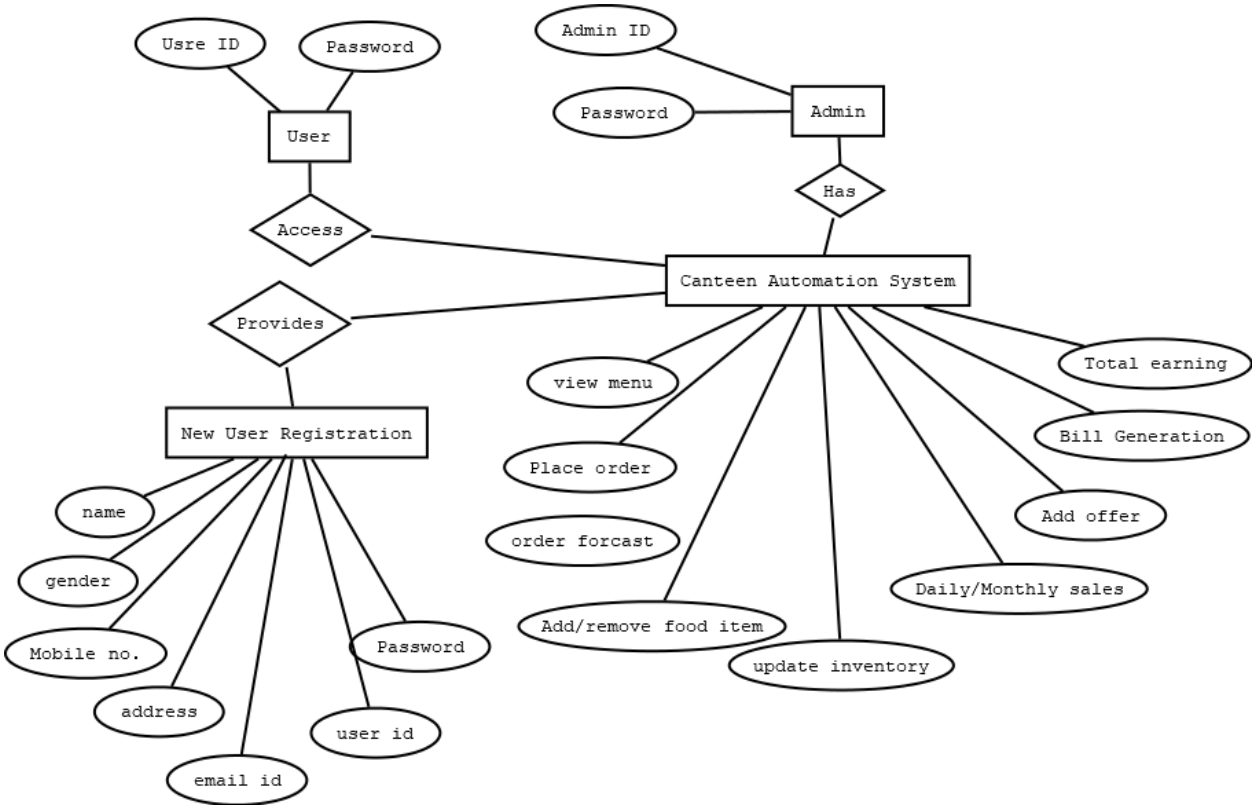
Reusable: All the customer web pages that are being used for customer information should be easily get processed so that many customers can interact with us very easily and very fast without any information destroy.

1.1 UML Diagram

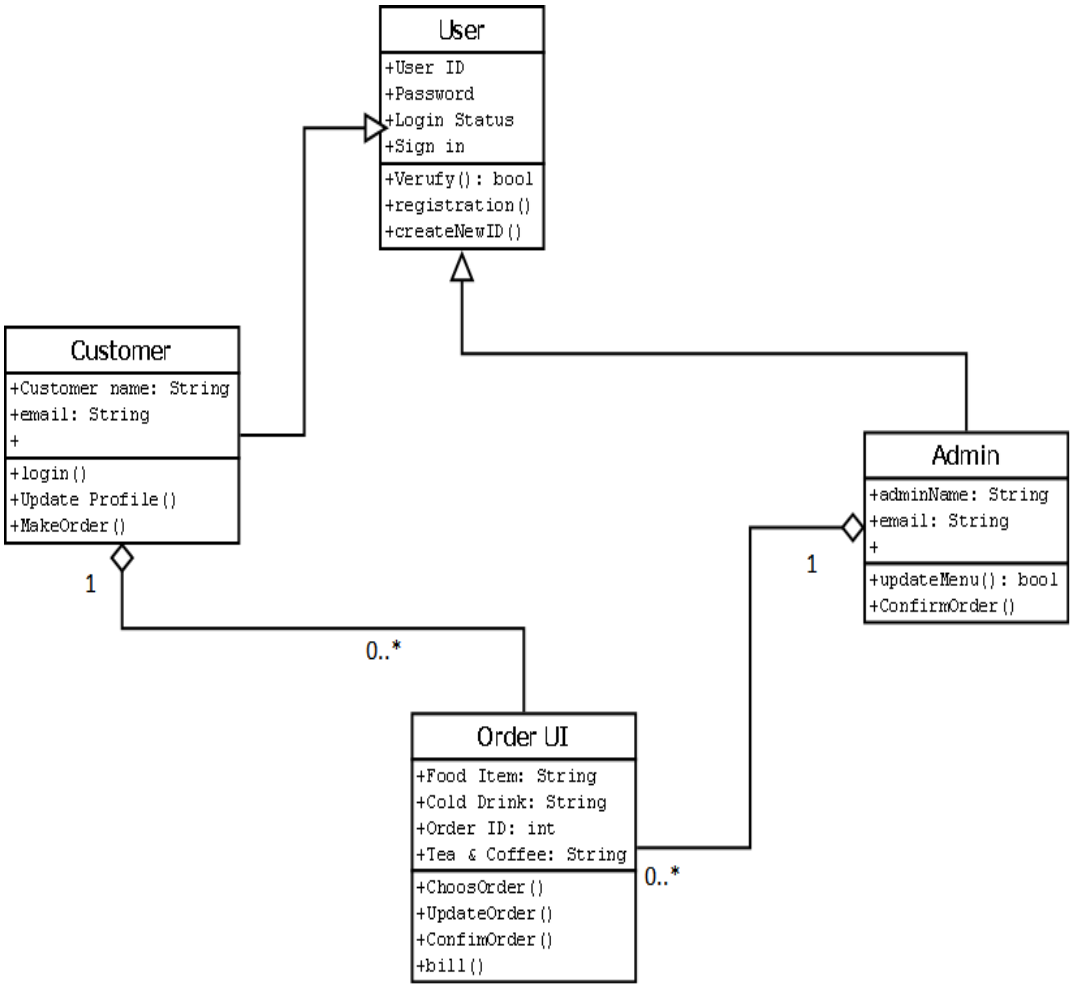
Activity diagram:



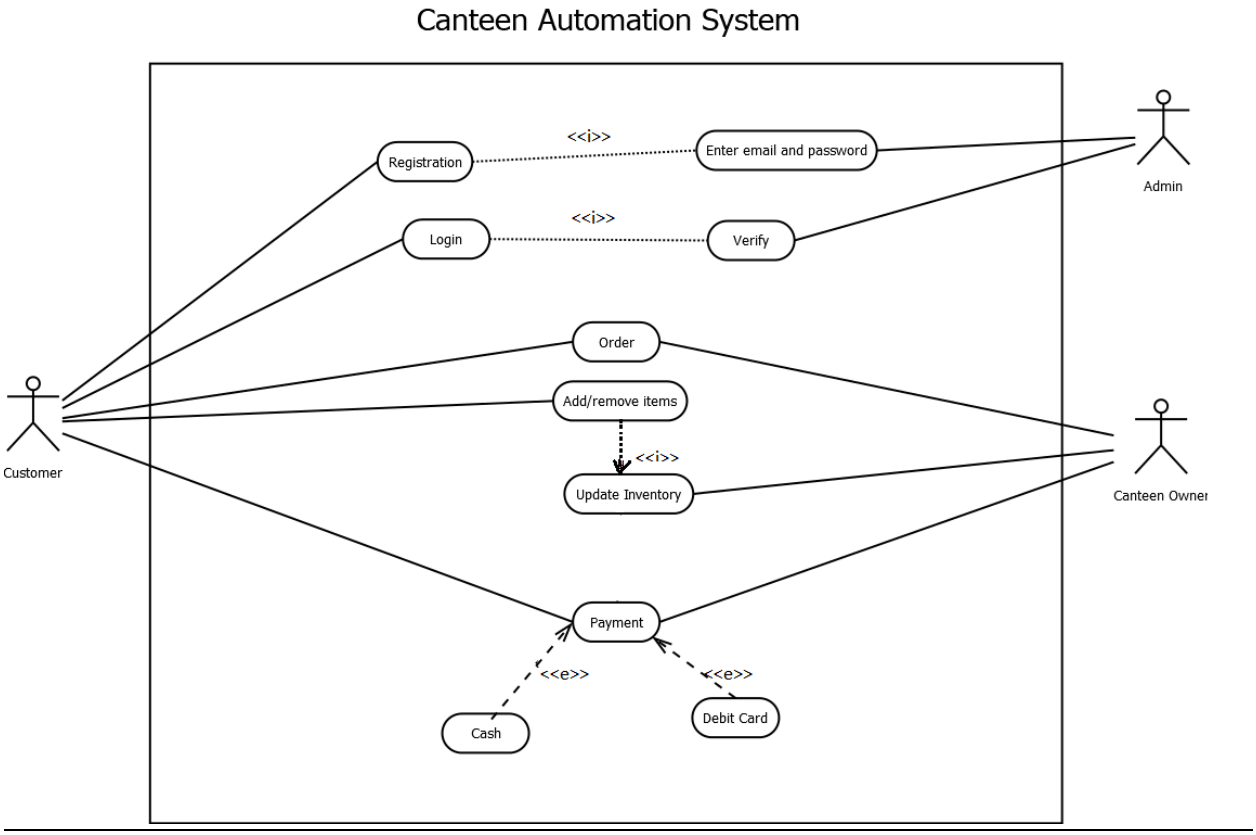
ER Diagram:


Usre ID
Password
User
Access
Admin ID
Password
Admin
Has
Canteen Automation System
Provides
New User Registration
name
gender
Mobile no.
address
email id
Password
user id
view menu
Place order
order forcast
Add/remove food item
update inventory
Daily/Monthly sales
Add offer
Bill Generation
Total earning

Class Diagram:



Use case:



3. SOFTWARE DEVELOPMENT LIFE CYCLE

3.1 Process Model

As our software is about the canteen automation system, so it is just that the product requirements will vary from time to time. In this perspective scrum is the most suitable process model we think. Besides, the model is the most efficient and easiest method

for our software. Scrum is a method where daily a meeting is held and every 24 hours, the daily requirements will be fulfilled.

First of all, we will collect the product backlog. Then daily some of the backlog will go to the sprint backlog and it will be the daily target. But if the customer wants to add more functionality in the meanwhile then those will also be added to the product backlog so that the developers can implement that in the software in the latter times.

But in scrum method, it has three processes they are-

- **Pre-game** (Planning + Architecture)
- **Game** (Sprint + Scrum meeting)
- **Post-game** (Demo + closure)

❖ **Pre-game:**

Pre-game process has 2 options to complete a software:

1. **Planning**

a. Definition of the system being developed

b. A Product Backlog list is created containing all the requirements that are currently known

c. The requirements are prioritized and the effort needed for their implementation is estimated

d. The product Backlog list is constantly updated with new and more detailed items, as well as with more accurate estimations and new priority orders

2. Architecture

a. The high-level design of the system including the architecture is planned based on the current items in the Product Backlog

b. In case of an enhancement to an existing system, the changes needed for implementing the backlog items are identified along with the problems they may cause

- **Game Phase:**

This phase is treated as a "black box" where the unpredictable is expected.

- **Post phase:**

  - This phase is entered when an agreement has been made such as the requirements are completed.
  - In this case, no more items and issues cannot be found nor can any new ones be invented.
  - The system is now ready for the release and the preparation for this is done during the post-game phase, including the tasks such as the integration, system testing and documentation.

- Why not Waterfall model?

Waterfall model can be adopted because in our case requirements are known in advance but there are some of the waterfall models due to which it is not feasible to adopt:

No parallelism of work.

- Time-consuming.

Besides, for software to make the canteen automation system the requirements will change. Because the environment is flexible and the waterfall model in these kind of circumstances is not suitable.

- Why not V-model?

Very rigid and least flexible.

Software is developed during the implementation phase, so no early prototypes of the software are produced.

If any changes happen in midway, then the test documents along with requirement documents have to be updated.

- Why not Evolutionary models?

These models are best-suited requirements are fuzzy. Models are best suited for the systems where requirements keep on changing but our system requirements are crystal clear so it is tot to adopt any of the evolutionary models.

- Why not Iterative model?

In an iterative model, each phase of an iteration is rigid with no overlaps. An iterative method will take 6 months to complete. The software and research have shown that longer iteration has higher complexity and risk.

- Why not Prototype model?

In a prototype model, there is no manual process or existing system to help to determine the requirements. The prototype is usually not a complete system and many of the details are not built in the prototype.

So, As the environment of the software is quite flexible, that is why we chose the scrum process model over the other process models. We think it will make our work much easier if we follow this process model.

3.2 Project Roll Identification and Responsibilities

We are using Scrum Method to develop our software. So, there will be some roles in this project. They are:

- Scrum Master
- Product Owner
- Scrum Team
- Customer
- Management

Responsibilities of the roles:

Scrum Master:

To develop Canteen Automation software system scrum master is responsible for ensuring that the project is carried through according to the practices, values, and rules of Scrum and that it progresses as planned.

Product Owner:

The product owner is officially responsible for the project, managing, controlling and making the product backlog list. He makes the final decision of the task related to the product backlog.

Scrum Team:

Scrum Team is the project team that has the authority to decide on the necessary actions and to organize itself in order to achieve the goals of each sprint. They are involved in effort estimation, creating the sprint backlog, reviewing the product backlog and suggesting impediments that need to be removed from the project.

Customer:

Our online customers or users will take part in the tasks related to Product Backlog items for the system being developed or enhanced.

Management:

Management is in charge of final decision making, along with the agreements, standards, and conventions to be followed in the project. Our Management also participates in the setting of goals and requirements.