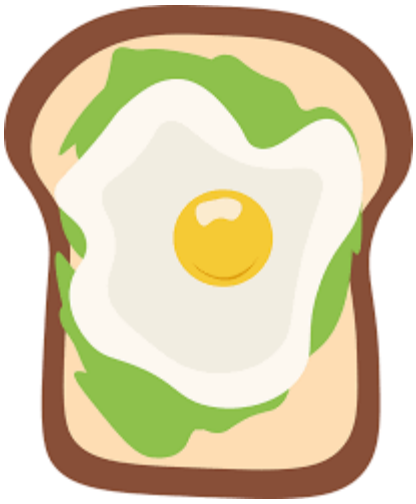

CSCI 441-A

Team B

Report #1 Part 1: Restaurant Automation

September 11, 2023

https://github.com/ivanvelocastaneda/CSCI441_A-Team-B-Project.git

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1. Customer Problem Statement
    a. Problem Statement

Manager:

Running a restaurant and overseeing employees is a challenging responsibility. My daily tasks can potentially be overwhelming at times. Some tasks include, keep track of which employees are on duty, figure out the payroll for every pay period, ensure employees punctuality and their compensation. Any means to reduce the effort required for these tasks would be greatly appreciated. Additionally, I should have the flexibility to update the menu with ease to ensure that we are matching the times we are actually serving and make modifications if needed in case we run out of the certain item. The restaurant's floor plan is subject to constant change, especially when large parties come in. I need to have the ability to make real-time adjustments to ensure staff have an accurate floor plan at their disposal. Farm to table serves as an employee portal, enabling employees to conveniently clock in and out while automatically calculating their compensation and hours worked. This feature will significantly make my life easier as I will no longer need to manually log employee hours or perform pay calculations. The site will handle these tasks smoothly. Furthermore, Farm to Table provides a swift interface for menu editing and floor adjustments, enhancing overall efficiency.

Waiter/Waitress:

Working as a waiter/waitress can be an incredibly demanding job, requiring us to be constantly on the move within the restaurant. We have to take customers orders, keep track of table orders, deliver orders quickly to ensure food stays hot and manage the process of closing out checks when customers are ready to pay their bill. With multiple tables in the restaurant, it can be a difficult process to keep track of what tables ordered what items and to determine what tables need to be cleaned and prepared for the next customer. Unfortunately, sometimes we have to send dishes back if it is not up to the customers standards or find something wrong with it. A site like Farm to Table would be immensely beneficial in allowing us to take customer's orders, keep track of them in the site, and send them directly to the kitchen. We would also love to receive notifications whenever

our food is finished getting prepared so the food does not stay on the window for too long. Lastly, we would like to close down tabs and input customer's payment (whether they paid cash or card) in the site to ensure we are making the correct amount of tips at the end of the day.

Host/Hostess/Busboy/Busgirl:

When I am welcoming guests into the restaurant, I would like to ensure their experience goes as smoothly as possible. As groups of multiple sizes arrive, they often have specific requests and preferences regarding their seating arrangements based on the number of people in their and where they would like to seat within the restaurant. Sometimes, there might be a five-person party seeking a booth or multiple tables put together and it is our responsibility to ensure there is an available spot and they do not wait too long to get seated. However, it is occasionally uncertain how long it would be until tables become free to accommodate a party's seating preferences.

Finding an appropriate table for our guests can pose a challenge since we do not know the current status of tables. We have to physically go and check if tables are clean or not. It would be highly beneficial to have a means of easily tracking which tables are occupied, unoccupied, and need to be cleaned without having to go through multiple stacks of paper. This information would enable us to provide guests with an estimation of when a suitable seating arrangement can be made.

A site like Farm to Table can help us identify which tables are occupied, unoccupied, or need to be cleaned.

Customer(s):

I love going out to eat, but it can be frustrating at times. It is not the staff's fault whatsoever. Sometimes they are incredibly busy and a waiter/waitress can take a long time to get to me unless they walk past me or make direct eye contact with me. It would be great if we could have a way to get a server's attention or order drinks/appetizers without having to wait for my server to get to me. It would speed up the process of time spent waiting.

Some sort of device on the table with a menu available to my party would be great in placing orders immediately without having to wait for my server to get to me if

they are busy. It would also be a great way to have an interactive menu that could offer more information on each item. The ability to have some sort of button on the device to call my server over to my table would solve the problem of waiting too long to be noticed or ask our server for help.

Cook/Chef:

Working in a kitchen requires a lot of patience and it can be a demanding job at times. We have to make sure the food is up to standard while simultaneously making it in a reasonable amount of time. We also have to make sure the order is accurate because it can be quite horrible if an order is made incorrectly. A person could potentially get hurt if their order contains an item they are allergic to as a result of miscommunication between us and the waiting staff. It is up to us and the waiting staff to ensure we have a happy customer because that means they would be more likely to come back in the future. It can be annoying at times trying to track a waiter/waitress down to let them know their food is ready to be delivered to their table. The food could get cold and take up space on the window, potentially risking a broken plate or the quality of the meal.

It would be of great help if we could have something to display all incoming orders. We would also love to have a way to let servers know that their food is finished without having to yell out their names to reduce the time the food sits on the window.

Farm to Table will generate a queue of incoming orders with a timestamp so that we are aware what food orders need to be made first so that we can stay on track. It would eliminate the necessity of handwritten orders thus eliminating any confusion in the server's poor handwriting since we would digitally have the details and requests of the server's tables. The site will allow us to send servers a ping to let them know they can come and pick up their meals so that they may be taken to their tables.

b. Decomposition into Sub-problems

   Already described within each problem statement.

c. Glossary of Terms

Cook/Chef: A person who prepares and cooks food, typically as a profession or as a skilled practitioner

Customer: An individual or group of individuals who visit an eating establishment to purchase and consume food and beverages

Employee Portal: It serves as a centralized hub where employees can access a variety of resources, tools, and information related to their employment and workplace

Floor Plan: Refers to the physical arrangement and design of tables, seating areas, and other elements within the dining area of a restaurant

Host/Hostess: An employee responsible for managing the front-of-house operations and ensuring a smooth and welcoming experience for diners

Manager: An individual who holds a position of authority and responsibility within an organization or business

Menu: A written or printed list of food and beverage items that a restaurant offers to its customers.

Queue: Typically refers to a line or waiting area where orders wait their turn to be cooked at a restaurant

Restaurant Automation: Refers to the use of technology and automated systems to streamline and improve various aspects of restaurant operations

Screen: Can refer to various digital displays or monitors used within the establishment for different purposes, often leveraging technology to enhance the dining experience

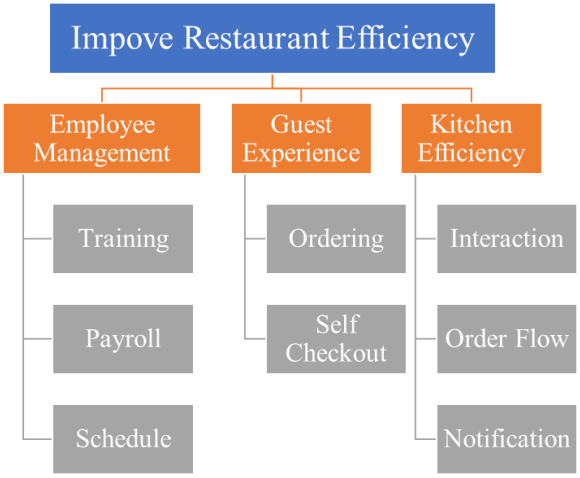
Tip: Refers to an additional sum of money that customers voluntarily leave for the staff as a token of appreciation for the service provided

Waiter/Waitress: Often referred to as a server, is an individual employed in the hospitality industry, typically at restaurants, cafes, or other dining establishments

Window: A platform used to place plates in

2. Goals, Requirements, and Analysis

a. Business Goals:



b. Enumerated Functional Requirements:

Identifier	Priority	Requirement
REQ-1	5	The system will allow customers to select items from the menu and put in an order through an interactive screen located .
REQ-2	5	The system provides the host with an interactive screen that displays current table layout in the restaurant.
REQ-3	4	The system will notify the chef with new orders and place them in the kitchen queue.
REQ-4	4	The system should automate and calculate employee hours and compensation.
REQ-5	5	The system should allow managers to easily update menu items and notify about unavailable dishes.
REQ-6	4	Employees should have the ability to clock in and out through an employee portal.
REQ-7	3	The system should offer waitstaff a notification system for when dishes are ready.
REQ-8	4	The system should digitally process checks and payments to assist waitstaff in tip calculation.
REQ-9	3	The system should provide real-time wait time estimations for guests
REQ-10	5	The system should allow customers and employees to

		login and logout.
REQ-11	2	The system should allow managers to add/remove employees from the system.
REQ-12	3	The system should allow customers and employees to view an order’s status.

c. Enumerated Nonfunctional Requirements:

Identifier	Priority	Requirement
NFREQ-1	5	The system provides customers with an interactive screen that displays current table layout in the restaurant.
NFREQ-2	5	The system must be secure, protecting all data especially payment and personal information in compliance with regulations.
NFREQ-3	4	The system should integrate seamlessly with existing systems or software used in the restaurant.
NFREQ-4	4	The system should be scalable to accommodate the restaurant's growth or changes.
NFREQ-5	3	The system should offer training modules or guides to assist employees in understanding the functionalities.
NFREQ-6	3	The system should have a feedback mechanism for users to report issues or provide suggestions for improvement.
NFREQ-7	4	The system must have a high availability, ensuring it remains operational during peak restaurant hours.
NFREQ-8	3	The system should offer multi-language support for diverse customer bases.
NFREQ-9	3	The system should allow customers to add extras or remove items from order.
NFREQ-10	3	The System should allow everybody to view item ingredients.
NFREQ-11	3	The System should allow everybody to create a reservation.
NFREQ-	2	The system should allow customers to create an rewards

12		account for points
NFREQ-13	3	Allow customers to order take out

d. User Interface Requirements

Identifier	Priority	Requirement
USREQ-1	5	Interactive Menu Display: The interface should provide customers with a visual and interactive menu. This should include clear images of dishes, concise descriptions, and the price. The interface should be intuitive for customers to place an order directly from this menu.
USREQ-2	4	Table Layout Visualization: Hosts and waitstaff should have a graphical interface displaying the current status of all tables in the restaurant (occupied, free, needs cleaning). It should be possible to update the table status in real-time.
USREQ-3	3	Interactive Order Display: The interface should provide customers with a visual and order status screen. This should keep customers more informed of their order status.
USREQ-4	3	Customer Account Page: The interface provides customers with a web page where they can log into from home to place orders for take-out or make table reservations.

3 Project Management

History of Work

August 21-September 4

After getting together after class and forming the team, we created a discord to brainstorm ideas for the project and establish a line of communication. After brainstorming for a day or 2, we all came up to the conclusion of doing a restaurant automation project since one of the members already had experience working at a restaurant and the rest of the members felt connected to such an idea. We got together on

the 31st of August to write up the proposal and discuss our strengths and weaknesses to decide what we are all capable of accomplishing.

September 5-September 10

We used the feedback from the proposal to plan the next few steps of the project. Some of the feedback helped come up with possible solutions the professor brought to our attention. We also took into consideration previous projects and reports and the functions they created. We could not get together during this time but everyone contributed to their assigned parts of the report. Bjarni started working on the database design using a UML diagram. He also created a SQL query for the database.

September 11-September 17

We will discuss Bjarni's database design during this time and the SQL query database he created. Also, we will brainstorm user interface ideas and the appearance of the site. We hope to come up with a model that best suits what we want our site to look like and accomplish. Lastly, we started working on part 2 of Report 1 and divided up the work.

September 18-October 1

We will take this time to continue discussing models and agree on a model that we are all comfortable and happy with. We will also start implementing the user interface and database.

October 2-November 2

We will continue implementing the user interface and database.

November 3-November 19

We hope that by this time, we will have a fully implemented model and get started with the testing part of the project.

November 20-December 8

We will take this time to fix bugs and present our final model to the class.

4 References

Links to previous restaurant automation reports

https://www.ece.rutgers.edu/~marsic/books/SE/projects/Restaurant/

Software Engineering Project Report

https://www.ece.rutgers.edu/~marsic/Teaching/SE/report1.html

Restaurant Automation Project Description

https://www.ece.rutgers.edu/~marsic/books/SE/projects/Restaurant/RestaurantAutomation.pdf