Software Engineering
Group #9
Restaurant automation
https://github.com/kevinlin47/Software-Engineering-Project

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	Team Member Name					
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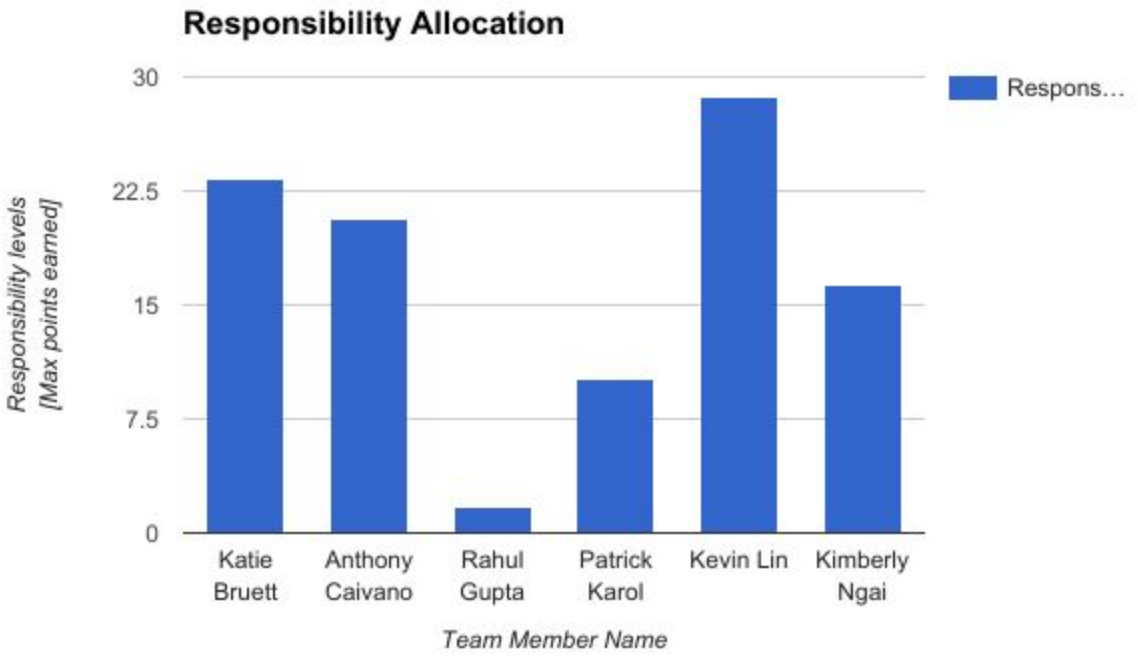
Project management (10 Points)	16.67%	16.67%	16.67%	16.67%	16.67%	16.67%
Sec.1: Customer Statement of requirements (9 points)	10%	15%		10%	65%	
Sec.2: System Requirements (6 points)				5%	95%	
Sec.3: Functional Requirements Specification (30 points)	17.4%	42%				40.6%
Sec.4: User Interface Specs (15 points)				30%	70%	
Sec.5: Domain Analysis (25 points)	60%			10%	20%	10%
Sec.6:Plan of work (5 points)		100%				


Responsibility Allocation
Respons…
30
22.5
15
7.5
0
Responsibility levels
[Max points earned]
Katie Bruett
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1. Customer Statement of Requirements

1.1 Problem Statements

1.1.1 Wasting Time

Everyone says time is money, a statement that proves inaccurate in any business. Doing things quickly and efficiently promotes business, from increases in sales and transactions to outputting more customers who are satisfied with the time in which they were served and their experience in general at the business. In order to reap these benefits, implementing a restaurant management software would be beneficial to time efficiency. Areas in the restaurant that would benefit are inventory tracking, receiving customer orders, delivering customer orders,and table management.

Inventory tracking requires a significant amount of time because of the need to count each individual item and keep it logged on paper or other software, for example microsoft excel, taking up time that could be used elsewhere in the restaurant. A way to cut down the amount of time needed to track inventory would lead to more time improving other aspects of the restaurant. The accumulation of time acquired from employing this solution would later lead to an increase in the restaurant's savings because it can do more tasks and hire fewer employees. An example of this is emphasized in the inventory tracking section of the solution program wherein an autonomously tracked inventory would have to be initialized by a chef or manager. As orders are filled in the kitchen, the system would deduct from the inventory the quantity of ingredients that went into a particular dish. However, unless the chefs are extremely accurate in their measurements, this inventory would quickly turn into an approximation. To quickly adjust for this, the chefs should be able to adjust the inventory in real time, which would keep the rest of the kitchen (and to a lesser degree, the management) better informed on the available stock. Furthermore, on a time-scale appropriate to the restaurant, the inventory could be reset and reinitialized to further improve the accuracy. At the end of the day the inventory can be easily analyzed, and help in making restocking decisions.

Receiving customer orders and delivering customer orders come hand in hand and there are many ways to make this more efficient. Currently, the most common method among restaurant businesses is with pen and paper. The waiter writes down on their notepad the customers' desired order from the menu, and the waiter then proceeds and delivers it to the chefs in the kitchen. The waiters then come back and check to see if the order has been completed, and

if so, the waiter can then bring the order to the correct customer. The saying “if it ain’t broke, don’t fix it” certainly can apply to this situation, but there are more efficient ways of doing this, utilizing both software and technology. Waiters will use a tablet to input orders to the kitchen. The chefs in the kitchen will then receive the orders through their computer system in the kitchen. The orders will appear in a queue style to keep them organized and fair. Once the order is complete, the chefs can notify the waiters through the software that their order is complete and ready to be delivered to the customer. This benefits the restaurant due to the fact that orders are sent through the computer, waiters do not have to enter the kitchen, except to pick up a completed order. After an order is initially placed, the tablet it left at the table for the customers to order any additional items they may need or have access to notify the waiters if they are needed for any reason. This saves the waiters time and allows them to be more attentive to their tables, resulting in better customer service reviews. Furthermore, during peak restaurant hours in a restaurant with a traditional ordering system, the kitchen can quickly be sent into a state of confusion and chaos, resulting in missed, delayed, or ruined orders; streamlining the ordering process would eliminate such a situation. Lastly, instead of waiters having to constantly check up on their submitted orders to see if they are ready, they can be instantly be notified by the chefs in the kitchen when their order is complete and ready for delivery.

Table management is important in keeping the flow of the restaurant in order; having the tables cleaned and ready to serve customers as quickly as possible would only improve efficiency. The flow of customers coming in and out at a fast pace is very important, especially when there are many customers at the given moment. The restaurant does not want customers to have to wait for the tables to be cleaned. This drops customer satisfaction and income. The more customers the restaurant serves, the more money it makes, and the fewer the restaurant serves the less amount of money it makes. Also, if customers have to wait an extra few minutes they may leave and go somewhere else to eat. As resolution, waiters can have a graphical user interface on their computers or terminals to notify when a table needs to cleaned. This would let the manager or bus boys know that a table is vacant and needs to be cleaned immediately in preparation for the next incoming customer. This way the staff responsible for cleaning tables can do so right away, instead of missing the information that a table needs to be cleaned. Also waiters and managers will be able to set a table as occupied or vacant. This allows quick checking of table availability and will allow staff to take reservations.

1.1.2 Tracking Statistics

Tracking various restaurant related statistics is important in formulating good business decisions. Being able to track what items are being sold the most and what items are being sold the least is valuable. If the restaurant knows which items are being sold more frequently, it can

make better decisions on ordering more inventory for items that are required to prepare this item. Conversely, knowing which items are being sold the least can help the restaurant decide to order less of the inventory required to prepare this item, or even just completely remove the item from the menu. This method of keeping an eye on popularity will allow the restaurant to know when exactly to start promotion of a failing item or lower the price in order to sell more and limit the amount of wasted inventory. This will save the restaurant money in the long run, and because the inventory is automatically kept track of in the system, this takes away the burden of tracking the information automatically.

Customer rating is a vital part in the efficiency of a restaurant. At the end of service, each customer would be presented with a survey on the tablet on their table, presenting them with questions concerning the different aspect of their service. This would allow management to track which departments of the restaurant are in need for improvement. It also gives management a clear idea of how customers are generally feeling about the restaurant in general or how the food is to see if any changes in the menu or recipes are needed.

1.1.3 Managing Employees

Tracking the amount of hours an employee works is needed to pay them correctly. Keeping track of hours can be done with a simple sheet of paper, the employee signs in when they show up, and signs out once they are done. While this method works, in a growing technology-based world this can be done by computer programs, which can save an incredible amount of time in calculating total employee hours per week. Any employee, be it a waiter, chef, busboy, or manager can use the built in feature of the software to make sure their work hours are correctly saved onto the system. Then once pay time comes along, individual pay can be easily calculated.

To operate this system, the employee punches in their assigned employee number at the start of their shift. The program automatically takes the current time on the computer as the start time, so the employee does not need to enter any information other than they are here to start their shift, and once their shift is done, the same procedure occurs the employee punches out signaling the system they are done with their shift. This procedure easily calculates the total time that was worked per day, per employee.

Doing it this way as some benefits, such as not requiring the employee to write down any information about time avoiding completely the situation if an employee was to fraud their start and end times. Using the computer time will avoid this problem and provide the most accurate start and end time. Also this avoids the possibility of losing the shift sheet, for any

reason such as accidentally throwing it away, spilling food on it, or a multitude of other reasons. Once on the computer, it is safe from human errors. Once pay time comes along and the payroll must be done, the program will automatically calculate the employee's pay, taking into account overtime hours, and display it on the computer. Therefore, the manager would simply have to is handle the direct deposit to the employee or send the information to whoever is handling the employee checks.

1.2 Glossary of Terms

1.2.1 Technical Terms

Program: a sequence of coded instructions that can be inserted into a mechanism (as a computer).

Software: The entire set of programs, procedures, and related documentation associated with a system and especially a computer system.

Terminal: Any device for entering information into a computer or receiving information from it, as a keyboard with video display unit,either adjoining the computer or at some distance from it.

Queue: A waiting line especially of persons or vehicles.

Graphical User Interface: A computer program designed to allow a computer user to interact easily with the computer typically by making choices from menus or groups of icons.

Application: A program (such as a word processor or a spreadsheet) that performs a particular task or set of tasks.

Feature: A prominent part or characteristic.

1.2.2 Non-Technical Terms

Efficiently: Productive without waste.

Initial: Of or relating to the beginning.

Waiter: A person who waits tables (as in a restaurant).

Chef: A skilled cook who manages the kitchen (as of a restaurant).

Order: To give an order for <*order* a meal>.

Chaotic: A state of utter confusion.

Reservation: An act of reserving something.

Statistics: A collection of quantitative data.

Formulate: To prepare according to a formula.

Yelp: A website where people go to read and write reviews about their favorite local businesses.

Modification: The making of a limited change in something.

Dish: An individual order of food off of the menu.

Plate: The whole order for a table; contains several dishes.

2. User Stories

Priority Key:

ST-X-#: High priority (highly likely to be implemented)

ST-X-#: Middle priority (likely to be implemented)

ST-X-#: Low priority (highly unlikely to be implemented)

Points are on a scale of 1-10 and they indicate an estimate of the effort needed to complete the user story based on its complexity and the team's skills.

2.1 Manager

Identifier	User Story	Time Estimated to Complete
ST-M-1	As a manager, I can add and remove food items from the menu based on sales.	Points 7
ST-M-2	As a manager, I can add and remove employees from the system.	Points 6
ST-M-3	As a manager, I can see which items are selling well and which items are selling not so well	Points 6
ST-M-4	As a manager, I can change employee salaries	Points 5
ST-M-5	As a manager, I can adjust food prices.	Points 8
ST-M-6	As a manager, I can see when an employee started and ended their shifts this week.	Points 4
ST-M-7	As a manager, I can keep track of restaurant inventory.	Points 5
ST-M-8	As a manager, I can see the total amount of money earned from	Points 7

	sales this week.	
ST-M-9	As a manager, I can see the cost of restocking inventory.	Points 6
ST-M-10	As a manager, I can set table reservations.	Points 5
ST-M-11	As a manager, I can schedule employee shifts.	Points 6
ST-M-12	As a manager, I can edit how much money is allocated to the budget	Points 7
ST-M-13	As a manager, I can see and approve or deny any employee request for days off.	Points 6
ST-M-14	As a manager, I can handle all maintenance requests	Points 5

2.2 Waiter

Identifier	User Story	Size
ST-W-1	As a waiter, I can create customer orders.	Points 7
ST-W-2	As a waiter, I can send customer orders to the chef	Points 8
ST-W-3	As a waiter, I can notify when a table needs to be cleaned.	Points 8
ST-W-4	As a waiter, I can notify when a table is being occupied.	Points 8
ST-W-5	As a waiter, I can find the total of amount of a customer's order.	Points 6
ST-W-6	As a waiter, I can see the total amount of hours worked this	Points 6

	week.	
ST-W-7	As a waiter, I can see my shift schedule for the week.	Points 7
ST-W-8	As a waiter, I can clock in and out of my shift.	Points 6
ST-W-9	As a waiter, I can request a day off.	Points 5

2.3 Chef

Identifier	User Story	Size
ST-Ch-1	As a chef, I can notify waiters when their orders are complete.	Points 8
ST-Ch-2	As a chef, I can see how much inventory is remaining	Points 9
ST-Ch-3	As a chef, I can notify the manager when inventory is getting low or completely gone.	Points 9
ST-Ch-4	As a chef, I can receive customer orders from waiters and have it displayed to me on screen.	Points 8
ST-Ch-5	As a chef, I can remove items from the menu if not enough inventory is available.	Points 9
ST-Ch-6	As a chef, I can designate the ingredients and cost of every dish on the menu.	Points 7
ST-Ch-7	As a chef, I can add new dishes to the menu on demand.	Points 7
ST-Ch-8	As a chef, I can edit the	Points 6

	inventory by item to adjust for inaccuracies.	
ST-Ch-9	As a chef, I can see the popularity for each dish by viewing the amount of orders that have been placed within my defined timespan.	Points 9
ST-Ch-10	As a chef, while viewing popularity, can search and sort each item.	Points 5
ST-Ch-11	As a chef, I can clock in and out of my shift.	Points 6
ST-Ch-12	As a chef, I can see how many hours I've worked in the week.	Points 6

2.4 Customer

Identifier	User Story	Size
ST-Cu-1	As a customer, I can order more food items.	Points 8
ST-Cu-2	As a customer, I can complete a survey.	Points 9
ST-Cu-3	As a customer, I can pay my bill.	Points 7

3. Functional System Requirements

3.1 Stakeholders

Below is a list of all who might benefit from this system:

- Chef
  Chefs will be able to more efficiently run their kitchen and delegate tasks
- Management
  Management will be able to handle finances and employees with ease and efficiency
- Customer
  Customers will be able to have a better dining experience

3.2 Actors

3.2.1 Initiating Actors

- Chef
  - Role: Chefs will be responsible for viewing orders and electronically notifying wait-staff when orders are finished.
  - Goal: Prepare food, take note of food inventory, and handle the menu
- Manager
  - Role: Managers will be responsible for running the restaurant
  - Goal: Manage the budgets and revenue, handle employees, and maintain restaurant
- Waiter
  - Role: Waiters will be in charge of interacting with the customers
  - Goal: Keep track of food progress for customers
- Customer
  - Role: Customers are visitors to the restaurant who will order food
  - Goal: Place orders, receive orders, and pay for them

3.2.2 Participating Actors

- Database
  - Role: The database stores all data that will be accessed and used by the system
  - Goal: Store any information/data regarding inventory, revenue, budgets, employees, maintenance, etc.

3.3 Use Cases

3.3.1 Casual Descriptions

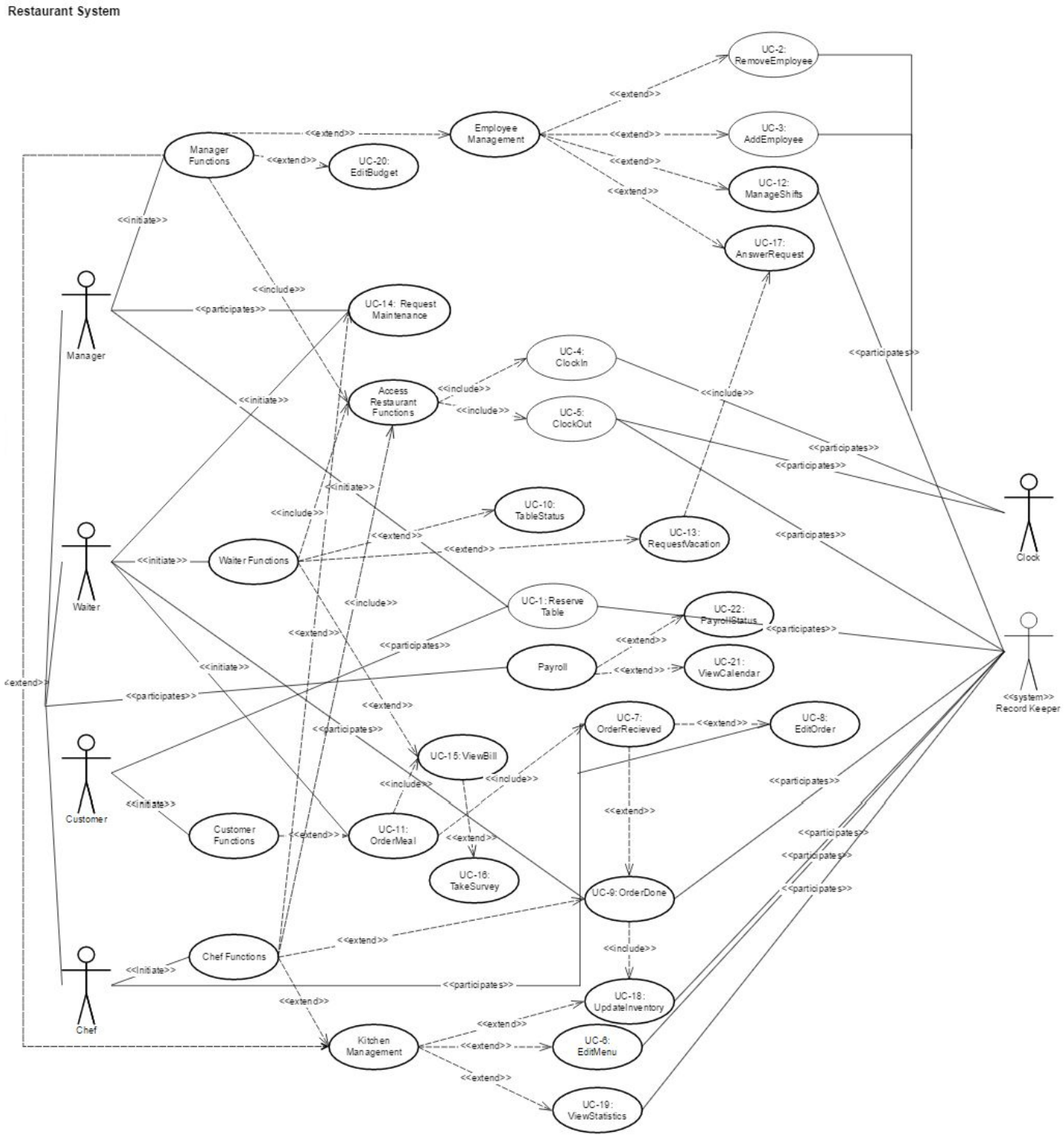
Use Case	Use Case Name	Description	Corresponding User Story
UC-1	ReserveTable	Shows available tables and can be selected to be reserved	**ST-M-10**
UC-2	RemoveEmployee	Removes an employee from the system when they are fired.	**ST-M-2**
UC-3	AddEmployee	Adds an employee to system when they are hired	**ST-M-2**
UC-4	ClockIn	Employees clock in for their shift	**ST-W-8, ST-Ch-11**
UC-5	ClockOut	Employees clock out of their shift	**ST-W-8, ST-Ch-11**
UC-6	EditMenu	Edit the menu by removing or adding items and adjusting prices	**ST-M-1, ST-M-5, ST-Ch-5, ST-Ch-6, ST-Ch-7**
UC-7	OrderReceived	Shows a customer's order as received by kitchen and puts into queue for chefs	**ST-W-1, ST-W-2, ST-Ch-4**
UC-8	EditOrder	Edits order that was already placed by the customer and notifies	**ST-Cu-1**

		the chef and customer of change	
UC-9	OrderDone	Alerts waiters that order is done and ready to be picked up. Updates inventory to account for ingredients used and food made.	**ST-Ch-1**
UC-10	TableStatus	Shows status of table as clean, dirty, vacant, or occupied. If not clean, notifies waiters that it needs to be cleaned. Status can be changed by employees.	**ST-W-3, ST-W-4**
UC-11	OrderMeal	Places customer's order to the system and sends to chefs	**ST-Cu-1**
UC-12	ManageShifts	Managers can edit calendar to schedule employees to shifts. Can add, remove, and edit employees to shifts.	**ST-M-11**
UC-13	RequestVacation	Lets employees notify/request manager of taking a day off	**ST-W-9**
UC-14	RequestMaintenance	Employees can request an item or equipment for maintenance	**ST-M-14**
UC-15	ViewBill	Allows customer to	**ST-W-5, ST-Cu-3**

		view and pay for their bills.	
UC-16	TakeSurvey	After payment, shows a survey that needs to be filled out by customer and sends results to system.	**ST-Cu-2**
UC-17	AnswerRequest	Managers can look at any requests for vacation or maintenance and approve or reject	**ST-M-13**
UC-18	UpdateInventory	Keeps track of ingredient quantity as orders are placed and ingredients are bought. Also keeps track of food ordered and profit from food. Notifies chefs and managers if running low of ingredient(s).	**ST-M-7, ST-Ch-8**
UC-19	ViewStatistics	Displays budgets, revenue, food popularity, and inventory and inventory costs. Chefs can only view inventory and popularity.	**ST-M-3, ST-M-8, ST-M-9, ST-Ch-3, ST-Ch-9, ST-Ch-10**
UC-20	EditBudget	Allows manager to change how much money goes to budget	**ST-M-12**

UC-21	ViewCalendar	Allows employees to see their shift schedule for the day, week, or month	**ST-M-6, ST-W-7**
UC-22	PayrollStatus	Displays the total number of hours an employee worked for a chosen week and how much money they've earned	**ST-M-4, ST-W-6, ST-M-6, ST-Ch-12**

3.3.2 Use Case Diagram



3.3.3 Traceability Matrix

	UC-1	UC-2	UC-3	UC-4	UC-5	UC-6	UC-7	UC-8	UC-9	UC-10	UC-11	UC-12	UC-13	UC-14	UC-15	UC-16	UC-17	UC-18	UC-19	UC-20	UC-21	UC-22
ST-M-1						X													X			
ST-M-2		X	X																			
ST-M-3																			X			
ST-M-4																						X
ST-M-5						X																
ST-M-6																					X	X
ST-M-7																		X	X			
ST-M-8																			X			
ST-M-9																			X			
ST-M-10	X									X												
ST-M-11												X										
ST-M-12																				X		
ST-M-13																	X					
ST-M-14														X								
ST-W-1							X				X											
ST-W-2							X				X											
ST-W-3										X												
ST-W-4										X												
ST-W-5															X							
ST-W-6																						X
ST-W-7																					X	
ST-W-8				X	X																	
ST-W-9													X									
ST-Ch-1									X													
ST-Ch-2																			X			
ST-Ch-3																		X	X			
ST-Ch-4							X															
ST-Ch-5						X																
ST-Ch-6						X																
ST-Ch-7						X																
ST-Ch-8																		X				
ST-Ch-9																			X			
ST-Ch-10																			X			
ST-Ch-11				X	X																	
ST-Ch-12																						X
ST-Cu-1								X			X											
ST-Cu-2																X						
ST-Cu-3															X							

Top 4 most important use cases: UC-19, UC-22, UC-6, UC-9

3.3.4 Fully-Dressed Descriptions

i) UC-6 (Edit Menu)

ID: UC-6
Title: Edit Menu
Primary Actor: Chef
Preconditions: A Chef is logged in to the system.
Postconditions: The menu is changed.
Main Success Scenario:

1. Chef presses “Manage Menu”
2. System shows list of items with corresponding prices
3. Chef presses “Add Item”
4. System prompts for name, ingredients, and price

5. Chef enters name, ingredients, and price of new food
6. Chef presses “Submit”
7. System returns to main menu

Extensions:

3a. Chef presses “Remove Item”

3a1. System prompts for name

3a2. Chef enters name of food

3a2a. Name is not in list

3a2b. System goes back to Manage Menu menu

3a3. System prompts for confirmation

3a4. Chef presses “Yes”

3a5. System removes item from list

3a6. Chef presses “Back”

3a7. System returns to main menu

6a. Chef chooses another option and process continues.

Frequency of Use: Once or twice a month

Priority: Low

ii) UC-9 (Order Done)

ID: UC-9

Title: Order Done

Primary Actor: Chef

Preconditions: An order has been placed and cooking is done

Postconditions: Waiters are notified that the meal is done, and the order list is repopulated.

Main Success Scenario:

1. All chefs manning a station clicks “Complete Component” when cooking is done

Extensions:

None

Frequency of Use: Several times per hour.

Priority: Medium

iii) UC-19 (View Statistics)

ID: UC-19

Title: View Statistics

Primary Actor: Manager

Preconditions: Manager is logged into system.

Postconditions: Manager knows the statistics s/he needs in order to continue working.

Main Success Scenario:

1. Manager selects View Statistics from main menu.
2. System displays options for statistics.
3. Manager selects Budget.

4. Budget is pulled up and Manager may edit.
5. If Revenue is selected, system displays restaurant revenue for month and week.
6. If Food Popularity is selected, system displays ranking list of food items by number of times ordered.
7. If Inventory is selected, system shows list of inventory items, quantity, and price of items.
8. Manager presses "Back" to get back to Statistics menu.
9. Manager presses either "Submit" or may choose another statistic to display.

Extensions:

3a. Manager selects Revenue.

3a1. System displays restaurant revenue for month and week.

3b. Manager selects Food Popularity.

3b1. System displays ranking list of food items by number of times ordered.

3b1a. System allows user to define a time interval for the ranking

3c. Manager Selects Inventory.

3c1. System shows list of inventory items, quantity, and price of items.

3c2. System gives error that Chef is editing.

3c2a. System returns to Statistics menu

Frequency of Use: Once or twice daily.
Priority: High

iv) UC-22 (Payroll Status)

ID: UC-22
Title: Payroll Status
Primary Actor: Manager
Preconditions: Manager is logged in.
Postconditions: Manager has a list of employees working hours for the week and the calculated pay for the week.
Main Success Scenario:

1. Manager selects "Payroll" from the main menu
2. System pulls up employee list with corresponding hours worked and subsequent pay
3. Manager selects "Submit"
4. System asks for confirmation
5. Manager presses "Yes"
6. System sends confirmation to Manager and sends the list to payroll
7. System returns to main menu

Extensions:

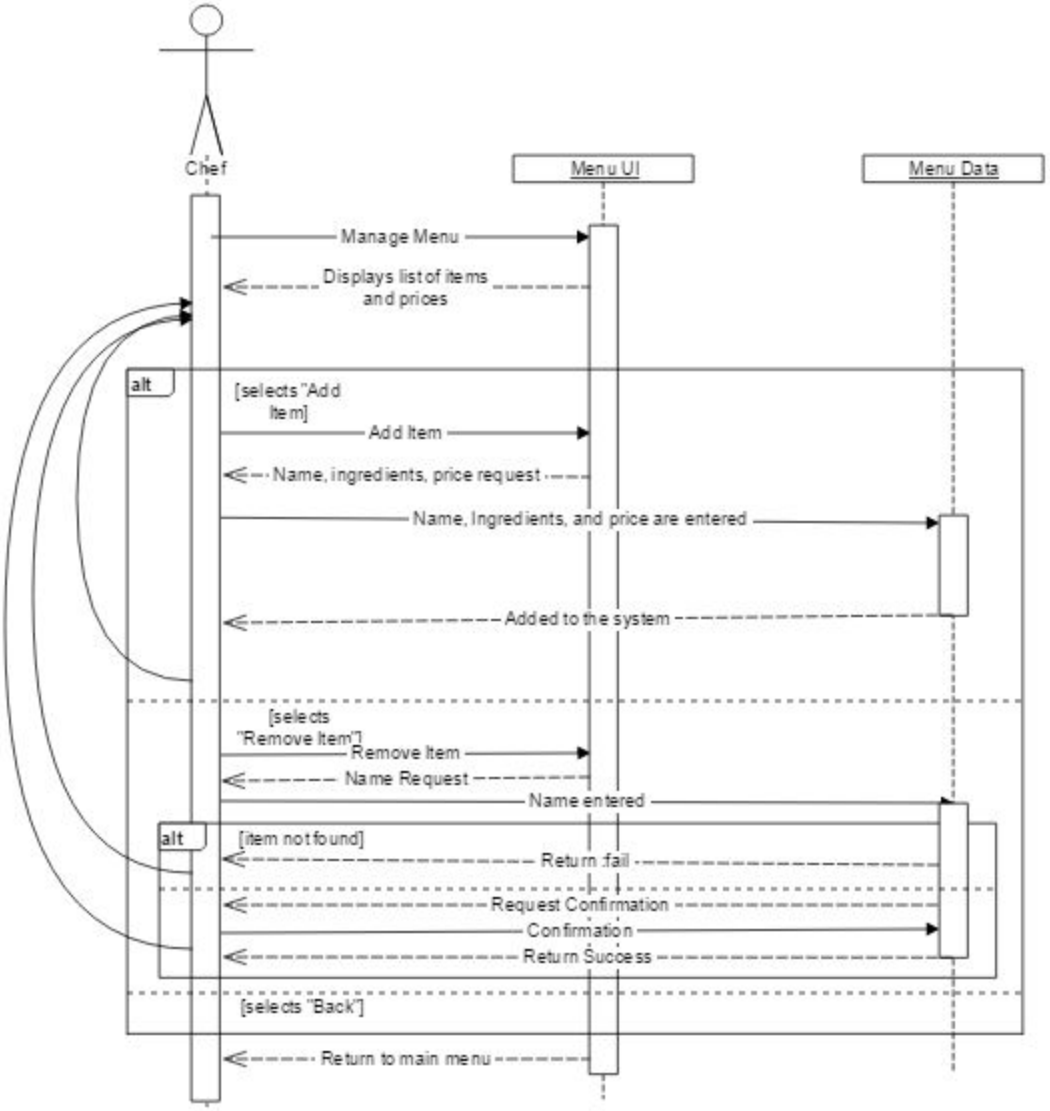
3a. Manager selects "Back"

3a1. System returns to main menu

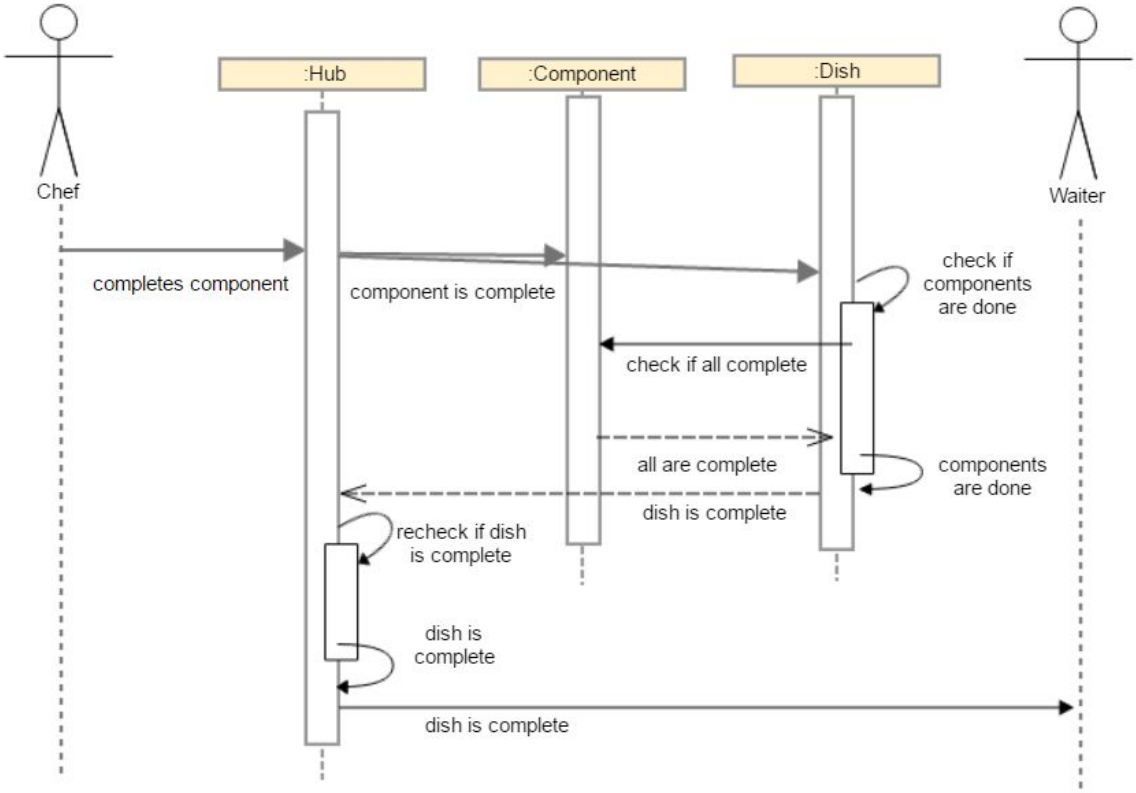
Frequency of Use: Once a Week.
Priority: High

3.4 System Sequence Diagrams

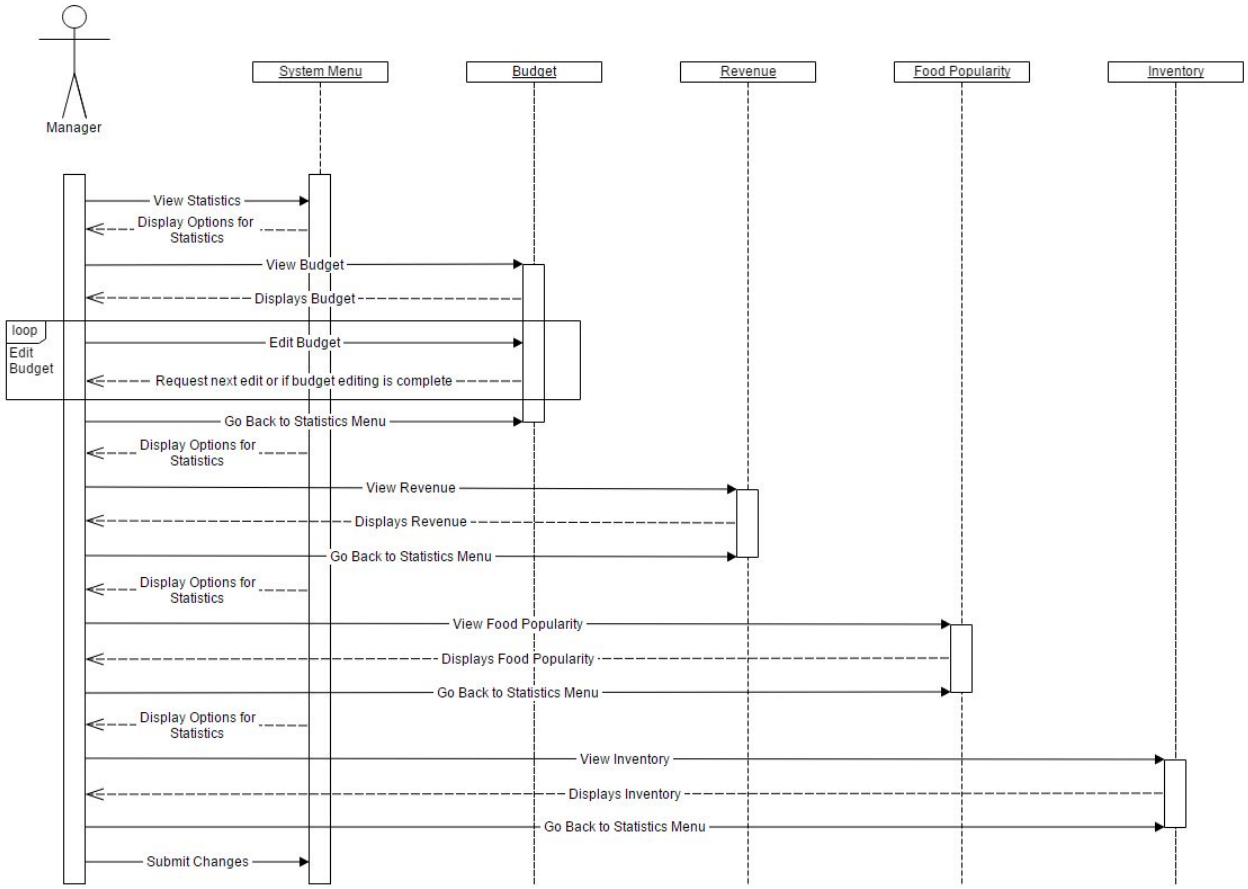
3.4.1 UC-6 (Edit Menu)



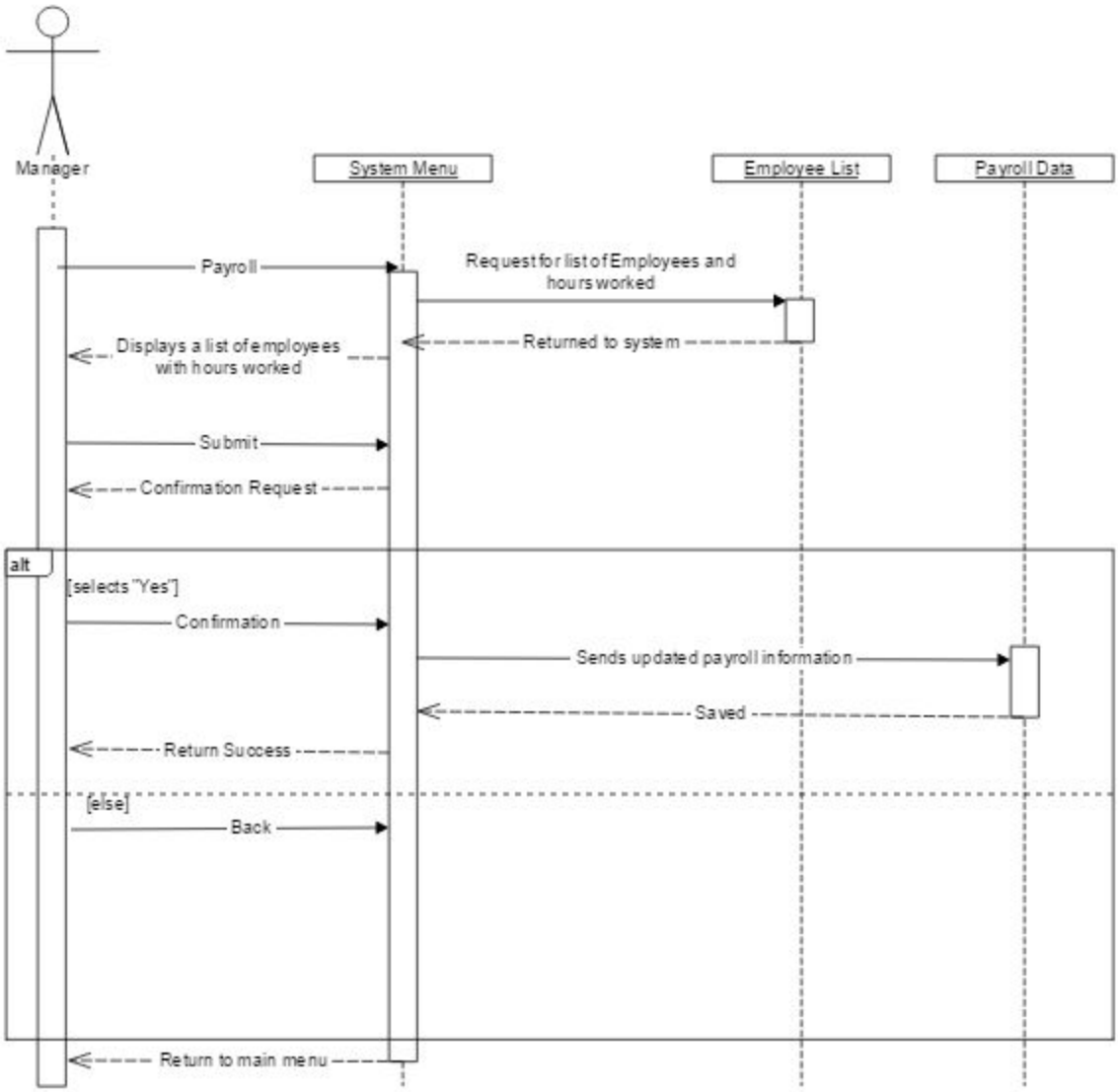
3.4.2 UC-9 (Order Done)



3.4.3 UC-19 (View Statistics):



3.4.4 UC-22 (Payroll Status)

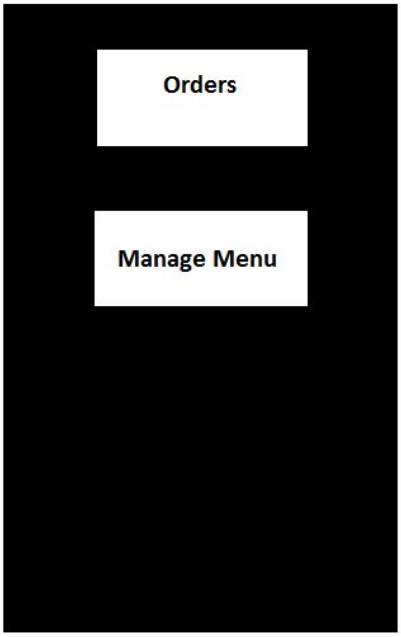


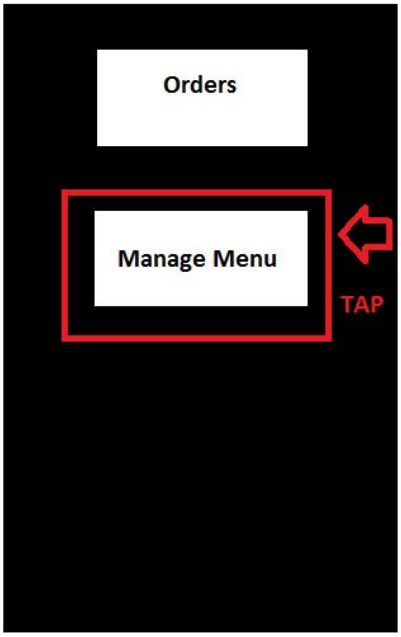
4. User Interface Specification

4.1 Preliminary Design

4.1.1 Preliminary UI for UC-6 (Edit Menu)

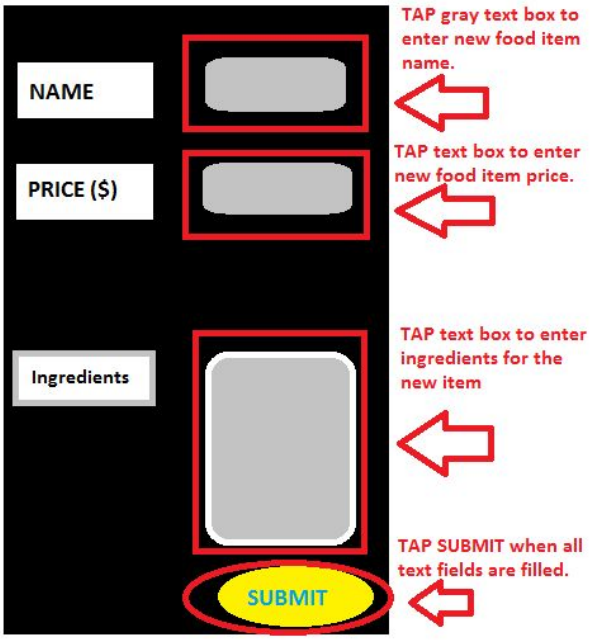
Chef Menu:




Orders
Manage Menu
TAP


Food
Price
Food listed alphabetically under Food
Food item price Listed adjacent to food name
$xx.xx
ADD

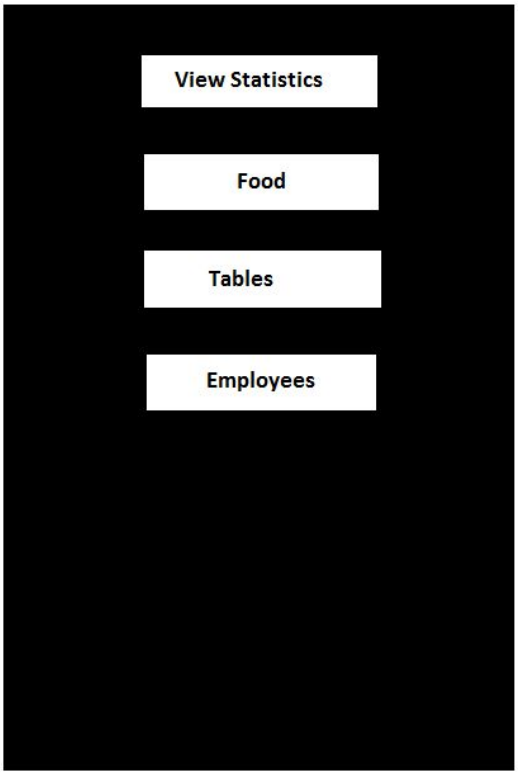

Food
Price
Food listed alphabetically under Food
Food item price Listed adjacent to food name
$xx.xx
ADD
TAP ADD to add new food item to menu

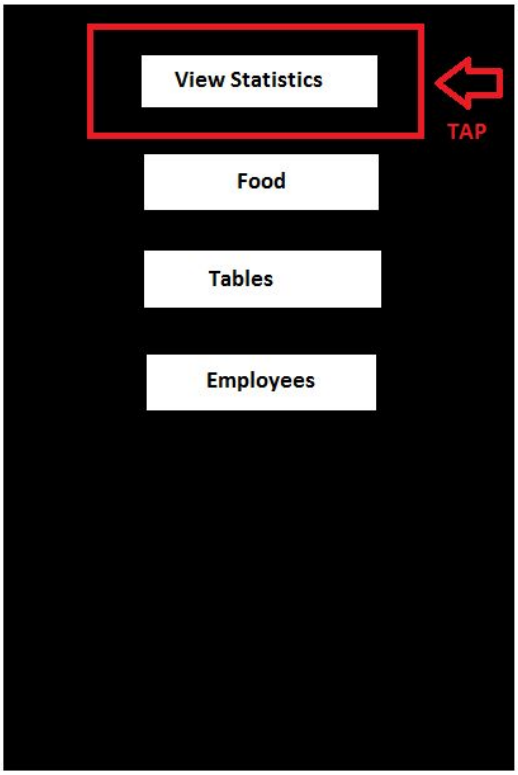

NAME
PRICE ($)
Ingredients
SUBMIT
TAP gray text box to enter new food item name.
TAP text box to enter new food item price.
TAP text box to enter ingredients for the new item
TAP SUBMIT when all text fields are filled.

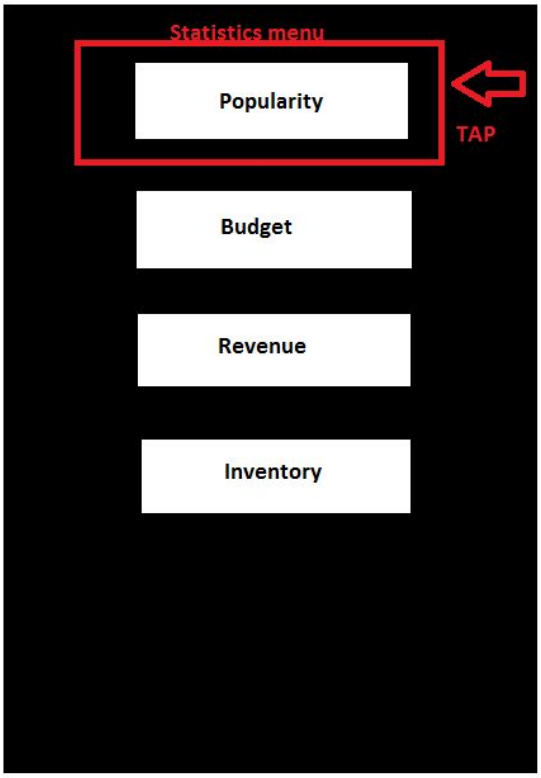
4.1.2 Preliminary UI for UC-9 (Order Done)

4.1.3 Preliminary UI for UC-19 (View Statistics)

Manager Menu:

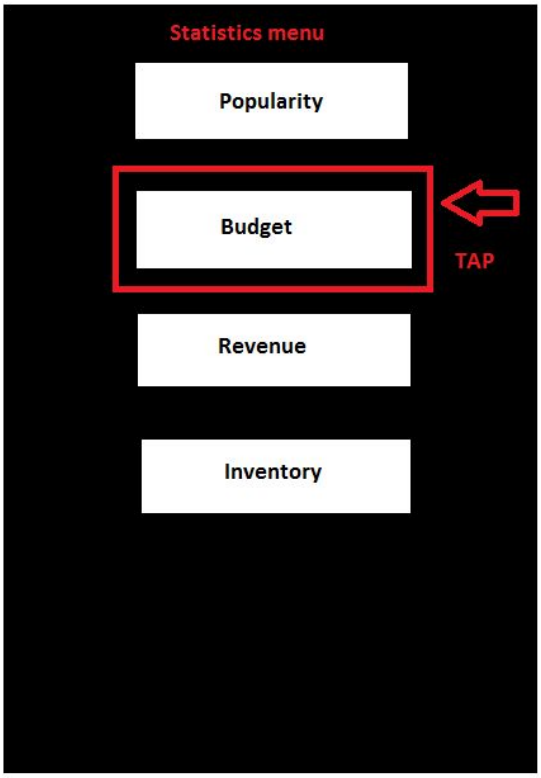


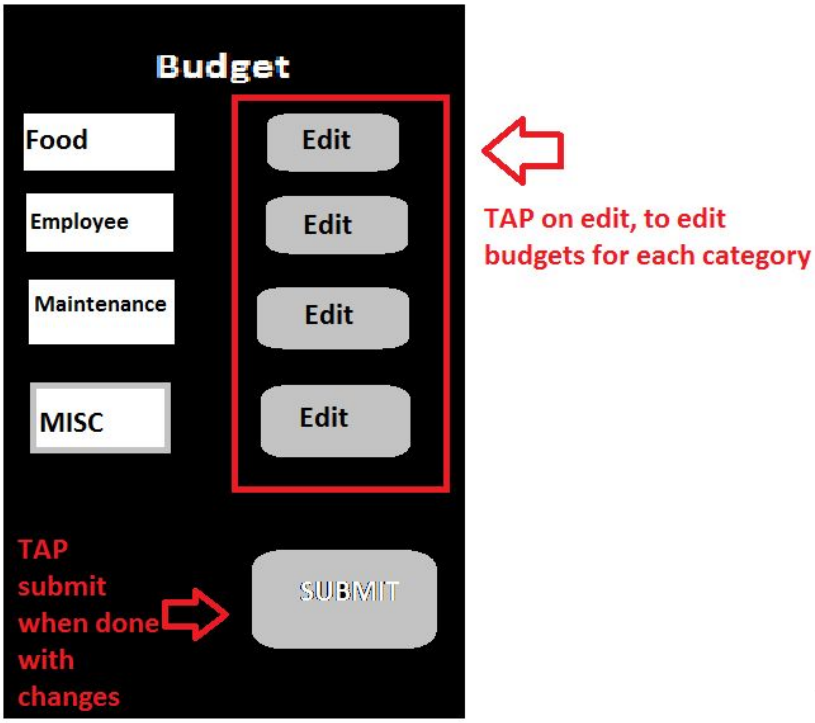

View Statistics
TAP
Food
Tables
Employees

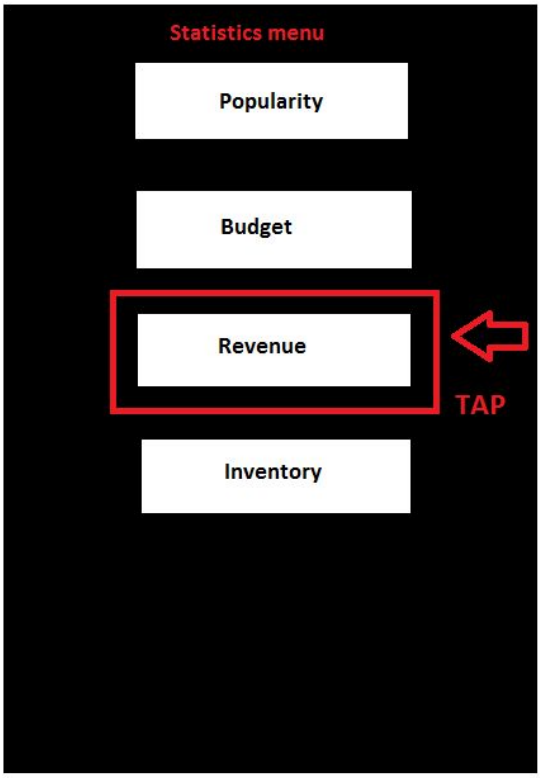


Items listed from most popular to least popular.

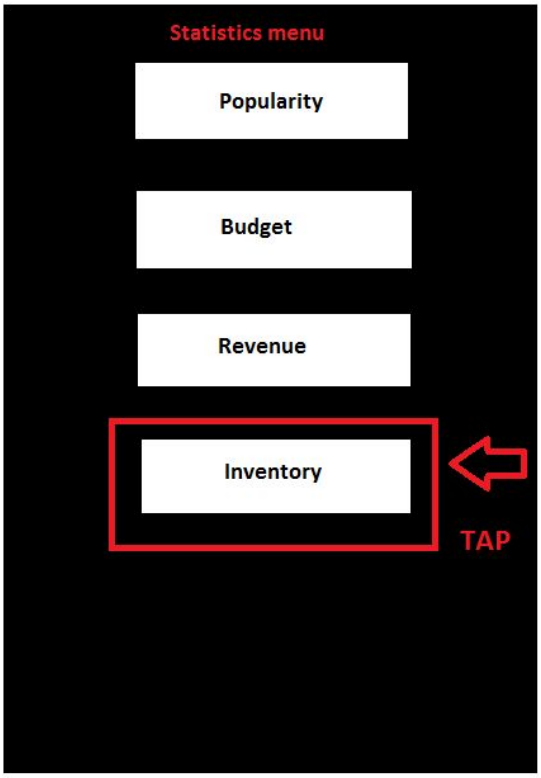
Order:	Food Name:
1.	item1
2.	item2
3.	item3
4.	item4
5.	item5
6.	item6
7.	itemX
8.	itemX
9.	itemX
10.	itemX
.x	itemX
.x	itemX
.x	itemX
.x	itemX
.x	itemX
.x	itemX
.x	itemX
.x	itemX
.x	itemX
.x	itemX


Statistics menu
Popularity
Budget
TAP
Revenue
Inventory


Budget
Food
Employee
Maintenance
MISC
Edit
Edit
Edit
Edit
TAP on edit, to edit budgets for each category
TAP submit when done with changes
SUBMIT


Statistics menu
Popularity
Budget
Revenue
TAP
Inventory


Week:
$XXX.XX
Month:
$XXXX.XX
Displays revenue made this week, and this month



Item	Quantity	Price
chicken	48 oz	3$/4oz
broccoli	5 heads	1$/160z
tomato	2 boxes	20$/box
beef	30 oz	5$/4oz
onion	2 bags	10$/bag
soda	one case	8$/case
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....
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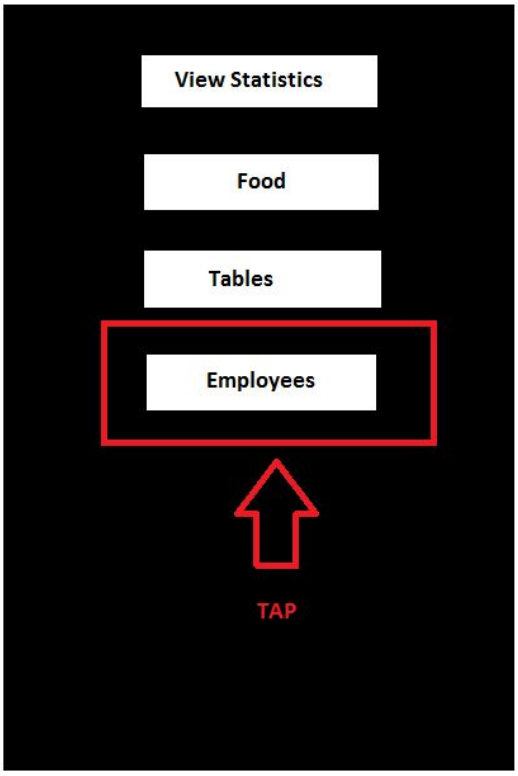
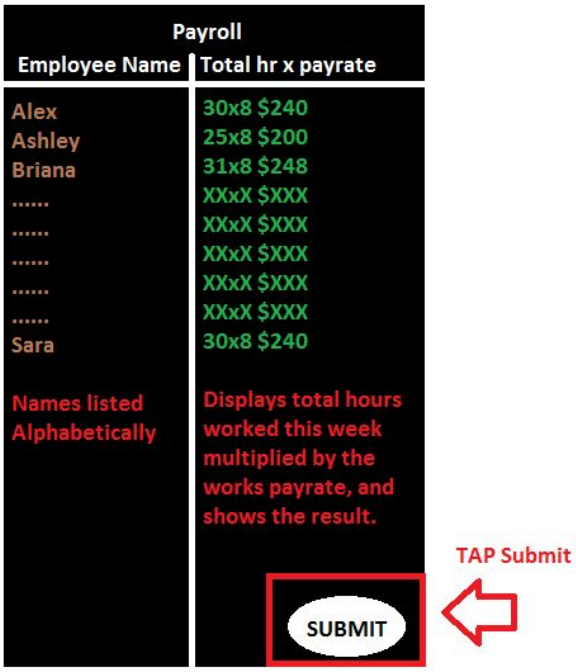
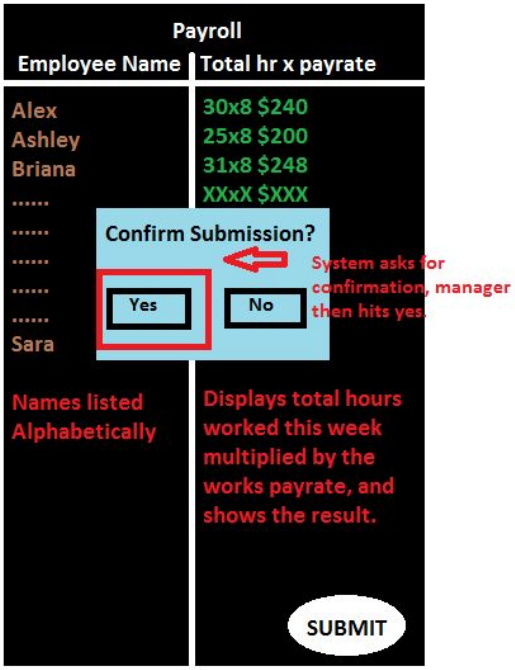
4.1.4 Preliminary UI for UC-22 (Payroll Status)




Payroll
Employee Name
Total hr x payrate
Alex
Ashley
Briana
.....
.....
.....
.....
.....
Sara
Names listed Alphabetically
30x8 $240
25x8 $200
31x8 $248
XXxX $XXX
XXxX $XXX
XXxX $XXX
XXxX $XXX
XXxX $XXX
30x8 $240
Displays total hours worked this week multiplied by the works payrate, and shows the result.
SUBMIT


Payroll
Employee Name
Total hr x payrate
Alex
Ashley
Briana
.....
.....
.....
.....
.....
Sara
Names listed Alphabetically
30x8 $240
25x8 $200
31x8 $248
XXxX $XXX
XXxX $XXX
XXxX $XXX
XXxX $XXX
XXxX $XXX
30x8 $240
Displays total hours worked this week multiplied by the works payrate, and shows the result.
SUBMIT
TAP Submit


Payroll
Employee Name
Total hr x payrate
Alex
Ashley
Briana
.....
.....
.....
.....
.....
Sara
30x8 $240
25x8 $200
31x8 $248
XXxX $XXX
Confirm Submission?
Yes
No
System asks for confirmation, manager then hits yes.
Names listed Alphabetically
Displays total hours worked this week multiplied by the works payrate, and shows the result.
SUBMIT

4.2 User Effort Estimation

4.2.1 UC-6 (Edit Menu)

ID: UC-6
Title: Edit Menu
Primary Actor: Chef
Main Success Scenario:

1. Chef presses “Manage Menu” (1 Click)
2. System shows list of items with corresponding prices
3. Chef presses “Add Item” (1 Click)
4. System prompts for name, ingredients, and price
5. Chef enters name, ingredients, and price of new food (4 Clicks)
6. Chef presses “Submit” (1 Click)
7. System returns to main menu

Total User Effort:

Navigation: total 2 (finger taps)

1. Navigate to manage menu page -1
2. Navigate to add item page -1

Data Entry: total 4 (finger taps) various amounts of keystrokes

1. Enter food name -1 tap/~5 keystrokes
2. Enter food price -1 tap/~4 keystrokes
3. Enter food ingredients -1tap/ undefined number of strokes
4. Submit changes or return to edit menu page -1

4.2.2 UC-9 (Order Done)

ID: UC-9
Title: Order Done
Primary Actor: Chef
Main Success Scenario:

1. All chefs manning a station clicks “Complete Component” when cooking is done (2-6 CLICKS)

Total User Effort: One click per chef, 2-6 clicks total

4.2.3 UC-19 (View Statistics)

ID: UC-19
Title: View Statistics
Primary Actor: Manager
Main Success Scenario:

1. Manager selects View Statistics from main menu. (1 Click)
2. System displays options for statistics.
3. Manager selects Budget. (1 Click)
4. Budget is pulled up and Manager may edit (1-10 Clicks).
5. If Revenue is selected, system displays restaurant revenue for month and week. (1 Click)
6. If Food Popularity is selected, system displays ranking list of food items by number of times ordered. (1 Click)
7. If Inventory is selected, system shows list of inventory items, quantity, and price of items. (1 Click)
8. Manager presses "Back" to get back to Statistics menu (1 Click).
9. Manager presses either "Submit" or may choose another statistic to display. (1 Click)

Total User Effort:

Navigation: total 6 (finger taps)

1. Navigate to statistics menu -1
2. Navigate to budget page -1
3. Navigate to revenue page -1
4. Naviage to food popularity page -1
5. Navigate to inventory page -1
6. Naviage to previous page -1

Data Entry: total 1-11 (finger taps) various amounts of keystrokes

1. Edit budget page - 1 to 10
2. Submit budget changes -1
3. Changing budget values -Undefined number of strokes

4.2.4 UC-22 (Payroll Status)

ID: UC-22
Title: Payroll Status
Primary Actor: Manager
Main Success Scenario:

1. Manager selects "Payroll" from the main menu (1 Click)
2. System pulls up employee list with corresponding hours worked and subsequent pay
3. Manager selects "Submit" (1 Click)
4. System asks for confirmation
5. Manager presses "Yes" (1 Click)
6. System sends confirmation to Manager and sends the list to payroll
7. System returns to main menu

Total User Effort:

Navigation: total 1 (finger tap)

1. Navigate to payroll page from main menu -1

Data Entry: total 2 (finger taps)

1. Submitting payroll -1
2. Responding to system confirmation -1

5. Domain Analysis

5.1 Domain Model

5.1.1 Concept Definitions

Description	**Type**	**Concept**
Contains information about vacancy and cleanliness of tables	K	TableStatus
Changes table to occupied, vacant, or dirty	D	ChangeTable
Contains information about food items being sold	K	Menu
Changes menu items, prices, etc.	D	ModifyMenu
Stores and displays any and all information regarding inventory	K	Inventory
Allows changes to be made to inventory	D	EditInventory
Employees can clock in and out of their shifts	D	ReportTime
Contains information about an employee's pay and displays the hours they've worked	K	Payroll
Displays how budget is allocated	K	Budget
Edits amount of money towards the budget	D	EditBudget
Shows profit gain/loss for a certain period of time	K	Revenue
Displays lists of actions an actor can pick/do based on previous actions or current situation	K	SystemInterface
Adds or removes employee from the system and allows edits to be made to their salary	D	EditEmployee
Displays status of whether order is ready or not	K	OrderStatus

Places customer's order and sends to chefs	D	Order
Chef updates order status as it is being made	D	OrderStatus
Notifies actor about recent change/action that needs to be taken	D	Notification
Contains information regarding the total cost of a customer's bill	K	Bill
Updates customer's bill as more food is ordered	D	UpdateBill
Allows customer to pay their bill	K	Payment
Contains questions that customers must answer at the end of their visit	K	Survey
Submits maintenance or vacation request from employees to manager	D	Request
Approves or denies request	D	UpdateRequest
Displays employees' shifts for given time	K	Shift
Allows manager to change shifts for all employees	D	EditShift

5.1.2 Association Definitions

Concept Pair	**Association Description**	**Association Name**
Change Table <-> Table Status	Change Table passes edits to table status	Edit Tables
Modify Menu <-> Menu	Modify Menu passes edits to Menu	Edit Menu
Edit Inventory <-> Inventory	Edit Inventory passes edits to Inventory	Edit Inventory
Report Time <-> Payroll	Report Time updates Payroll with hours	Edit Hours
Edit Budget <-> Budget	Edit Budget sends changes to Budget	Edit Budget

Revenue <-> Edit Budget	Changes in Revenue sent to Edit Budget	New Revenue
Edit Employee <-> Payroll	Changes in Employee list sent to Payroll	Edit Payroll
System Interface <-> Order	System Interface sends customer order to Order	Edit Order
Order Status <-> Notification	Order Status sent to notification of waiter	Notify Order
Bill <-> System Interface	Information on Bill sent to Customer System Interface	Customer Bill
Update Bill <-> Bill	Updates on Bill sent to Bill	Edit Bill
Payment <-> Revenue	Customer Interface allows payment to process and payment is sent into revenue	Customer Payment
Survey <-> System Interface	Customer Interface allows survey to be given to customer and answers are placed back into interface	Survey Answer
Notification <-> Request	Requests given to notification to Manager	Notify Request
Notification <-> Update Request	Manager approval or denial to request sent to notification to employee	Notify Answer
System Interface <-> Change Table	Employee Interface allows edit to be made to table statuses	Make Table edit
System Interface <-> Modify Menu	Employee Interface allows edit to be made to menu	Make Menu edit
System Interface <-> Edit Inventory	Employee Interface allows edit to be made to inventory levels	Make Inventory edit
System Interface <-> Edit Budget	Manager Interface allows edit to be made to budget	Make Budget edit
System Interface <-> Edit Employee	Manager Interface allows edit to be made to employee list	Make Employee edit
Shift <-> Edit Shift	Edits in shifts are sent to shift in order for employees to see their schedules	Change Shifts

System Interface <-> Edit Shift	Manager Interface allows edits to be made to employee schedules	

5.1.3 Attribute Definitions

Concept	Attributes	Attribute Description
Table Status/Change Table	Cleanliness	If the table is clean or dirty, given that the table is empty. Has ability to change this.
	Status	If the table is currently being occupied or not and ability to change it
	Table Number	The specific number of the table being asked about
Menu/Modify Menu	Type of Item	Whether the item is a appetizer, entree, dessert, or drink and ability to change it
	Name of Item	The name the restaurant wants to display and ability to change it
	Description	The description paired with the item to be displayed on menu and ability to change it
	Price	How much the item will cost and ability to change it
Inventory/Edit Inventory	Ingredient List	Has names of all ingredients in kitchen. Allows for the ability to change these
	Ingredient Amount	Contains current amount of all ingredients and allows the ability to alter these amounts

Report Time	Employee ID	The number of the specific employee who is logging their hours
	Arrival	Contains the time the employee logged into the system
	Departure	Contains the time the employee logged out of the system
Payroll	Employee ID	The number of the specific employee who is being accessed
	Hours	Contains total hours worked by the employee in the current week
	Pay	Contains current pay rate and calculated pay of the week to date
Budget / Edit Budget	Current Budget	Displays allocation of money towards savings, kitchen, management, and maintenance. Allows for altering of the allocations
Revenue	Income	Displays amount of money taken in in past week and allows for altering
	Expenditures	Displays amount of money spent in past week and allows for edits
	Profit/Loss	Displays difference in income and expenditures
System Interface	Accessor	Contains information on who is accessing system to display only information the person is allowed to see

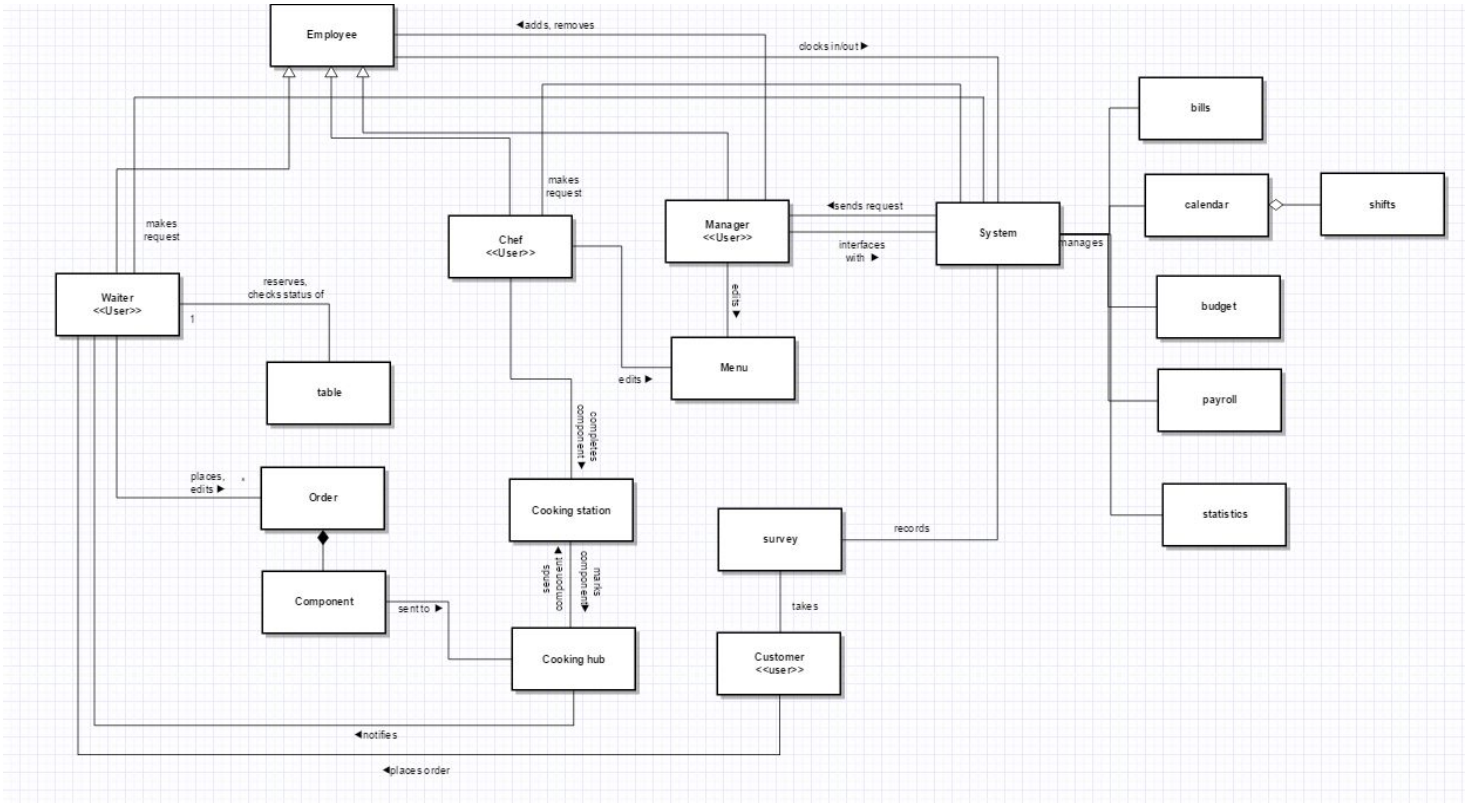
	Choices	Depending on accessor, displays choices of specific sections of the interface the user would like to access
Edit Employee	Employee ID	The number of the specific employee who is being accessed
	Pay	Allows for the editing of the current pay rate of the employee in question
Order / Order Status	Order	Contains specific item/s being ordered. Allows for addition of more items
	Table Number	Contains table number of the order being prepared and accessed
	Status	Contains if the order is finished being made or not and allows for the chef to edit
Notification	Employee ID	Contains ID of the employee who needs to be notified
	Change/Action	Contains the description of the task that the employee needs to be notified of
Bill / Update Bill	Order	Contains name and quantity of each item ordered by table
	Table Number	Number of specific number of table the bill is associated with
	Cost	Total cost of all the items in the order
Payment	Cost	Total Cost of all items in the order

	Pay	Allows customer to pay the cost of the order
Survey	Questions	Contains questions for the customer to answer
	Choices	Contains all the choices the customer can answer to each question
Request	Employee ID	Contains the ID of the employee submitting the request
	Type	If the request is for maintenance or vacation day
	Description	Contains entered information by employee of the request
Update Request	Request	Contains the request information submitted by an employee
	Approval	Gives the Manager a choice in accepting or denying a request from the employee
Shift / Edit Shift	Employee ID	Specific ID of employee whose schedule is being tracked
	Schedule	Given days of the week and corresponding times that the employee will be working

5.1.4 Traceability Matrix

	UC-1	UC-2	UC-3	UC-4	UC-5	UC-6	UC-7	UC-8	UC-9	UC-10	UC-11	UC-12	UC-13	UC-14	UC-15	UC-16	UC-17	UC-18	UC-19	UC-20	UC-21	UC-22
TableStatus	X									X												
ChangeTable	X									X												
Menu						X																
ModifyMenu						X																
Inventory																		X	X			
EditInventory																		X				
ReportTime				X	X																	X
Payroll																						X
Budget																			X			
EditBudget																				X		
Revenue																			X			
SystemInterface	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
EditEmployee		X	X																			
OrderStatus							X		X													
Order								X			X							X				
Notification										X								X				
Bill															X							
UpdateBill															X							
Payment															X							
Survey																X						
Request													X	X								
UpdateRequest																	X					
Shift												X									X	
EditShift												X										

5.1.5 Domain Model Diagram



5.2 System Operation Contracts

5.2.1 UC-6 (Edit Menu)

Name:	Edit Menu
Responsibilities:	Edit menu items using the application on a tablet.
Use Cases:	UC-6
Exceptions:	Manager can also perform this Use Case
Preconditions:	A chef is logged in to the system
Postconditions:	The menu is changed

5.2.2 UC-9 (Order Done)

Name:	Order Done
Responsibilities:	Notify waiters when their order is done.
Use Cases:	UC-9
Exceptions:	None
Preconditions:	An order has been placed and is marked as complete.
Postconditions:	Waiters are notified that their order is done, and the order is removed from the queue.

5.2.3 UC-19 (View Statistics)

Name:	View Statistics
Responsibilities:	Display desired statistical information to the manager.

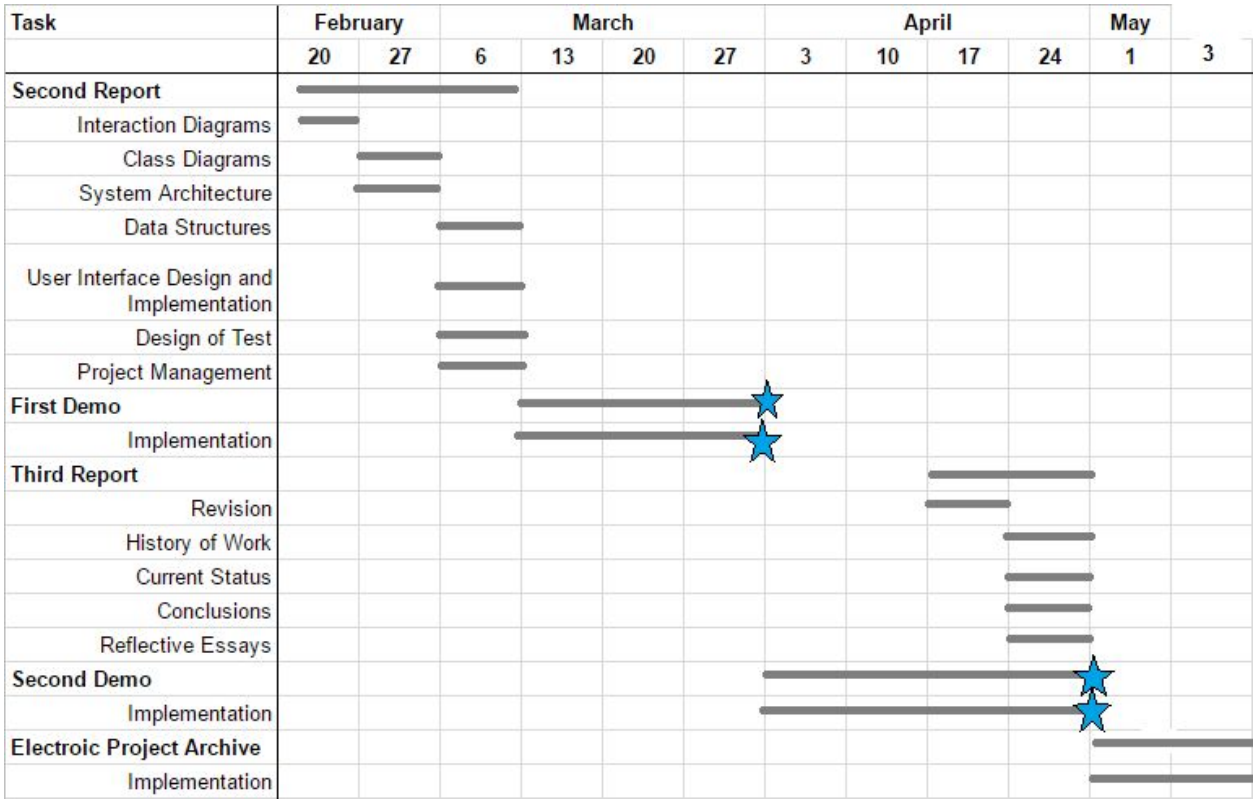
Use Cases:	UC-19
Exceptions:	None
Preconditions:	Manager is logged into the system.
Postconditions:	Manager is shown the statistics that he/she requested.

5.2.4 UC-22 (Payroll Status)

Name:	Payroll Status
Responsibilities:	Display information to the manager regarding each employee's total work hours this week and their corresponding pay.
Use Cases:	UC-22
Exceptions:	None
Preconditions:	Manager is logged into the system.
Postconditions:	Manager has a list of employees working hours for the week and the calculated pay for the week.

6. Plan of Work

6.1 Gantt Chart



6.2 Product Ownership Description

In order to maximize efficiency, we implemented decomposition by projection and separated our group of 6 into 3 smaller sub-groups. The sub-groups are: Anthony and Patrick, Katie and Kim, and Rahul and Kevin. Anthony and Patrick are responsible for the kitchen duties, Katie and Kim for the management duties, and Rahul and Kevin for the customer service duties. Each of the above sub-groups will be responsible for the respective functional features, or things listed in the “Plan of Work” section above, e.g. the Management team will be responsible for the things listed under the Management portion of the “Plan of Work” section.

6.3 Breakdown of Responsibilities

A detailed examination of the what each member has done so far can be seen on page two of this report. For the remainder of the project, each sub-group will be mainly responsible for their management and implementation. Coordination, however, is key for project coherency, and each sub-group will provide semi-regular updates on their progress; this will be especially true in the weeks leading up to each of the demonstrations.

7. References

1. **Group 3 2015 Report format:**
   http://eceweb1.rutgers.edu/~marsic/books/SE/projects/Restaurant/2015-g3-report3.pdf

2. **Term definitions:**
   https://www.merriam-webster.com/

3. **Wikipedia example of user stories:**
   https://en.wikipedia.org/wiki/User_story