The Automated Waiter System (AWS)
Case Project
BADM 64
Professor
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Executive Summary

When customers elect to dine at a restaurant, they wish to have a positive experience and be catered to. Many problems can arise in terms of a lack of service by waitpersons, incorrect orders, long wait times, etc.

To improve the dining experience, we have created the Automated Waiter System (AWS). Located at each customer's seat, there will be a Pocket PC with a stylus. The Pocket PC will be wirelessly connected to the computer system, which includes numerous other Pocket PCs, two servers, computers throughout the restaurant and kitchen, and all of the other technical components.

AWS will allow the customer to be in control of their dining experience. They will not be dependent on their waitpersons. The waitpersons will complement the system: they will perform tasks that the system cannot, such as delivering food. Customers will be able to place their orders with specifications/ omissions through the Pocket PC that will then send the order to the kitchen. Customers will be able to pay their bill, request a refill, etc. without being dependent on their waitperson.

Although AWS requires an initial large investment from the restaurants, it will be well worth it when the restaurants are able to see the benefits that it provides. It will provide benefits both financially and in terms of customer satisfaction.

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I. Business Problem

Summary and Brief Description

Have you ever been sitting in a restaurant waiting for a person from the wait staff to notice you? Do you still need your menu? Are you ready to order but no one is attending to you? Have you ordered already but still waiting for a drink refill? Are you upset because the waiter/ waitress didn't omit what you asked him/her to? Are you running late and can't find your waiter/waitress to pay your bill? All of these problems occur at restaurants every day due to the fact that waiters/ waitresses have many responsibilities, and they cannot focus all of their attention on customer satisfaction. They are responsible for many tables and have to cater to about 20 peoples' needs. If you've experienced one or more of these issues, then we have the solution for you!

Traditionally, after entering the restaurant, the customers have to wait for host/hostess to seat them. After being seated, a menu may or may not be given to the customers. If the menu is not given, the customers have to then wait again for their waiter/waitress to come to the table before they can begin looking at the menu. After the customers have their menus, they can place their drink order. They will have to wait for their waiter/waitress to bring their drinks to the table before they can order their food. The food then has to be imputed into a computer system by the waiter/waitress. After the food is prepared and delivered, the meal is far from over. Many individuals choose to complete their dining experience with a dessert. In order to get their dessert, customers must first alert their waiter/waitress to get a dessert menu. Then after reviewing it, they can place their order.

At the conclusion of the meal, the process of getting one's check includes a lot of waiting time and thus extends the amount of time required to eat in a restaurant. It is understandable that sometimes a nice long dinner is desirable; however, in the middle of the workday, time is of the essence. If the time required to eat lunch/ dinner in a restaurant were decreased, the amount of business the restaurant receives during the week would increase.

Customer Moment of Value

The customer that will be catered to is any person who steps inside the dining establishment to partake in a meal. This customer will want to be seated promptly, have their order taken quickly, consume fresh and good tasting food, and pay for the bill in a quick and simple manner.

The customer moment of value is defined as providing service when the customer wants it, where the customer wants it, how the customer wants it, and providing the service in a manner guaranteed to the customer (perfect delivery). In our scenario, a restaurant, the customers want their service to be prompt and efficient. They want to be given the menu quickly and have an adequate time to review it. They then want their ordering process to be quick and the preparation of their food to be fast and done without error. Following the meal, the customers then want to receive the check promptly, want to be able to read it and want to be able to clearly understand the charges they are about to receive. If the customer is paying with cash, they want to give the check along with their cash to the wait staff and quickly receive change from the wait staff member servicing their table. If the customer is paying with a credit card, they want to be able to

give their credit card to the waitperson, along with the bill, and have it processed through the system quickly.

While dining, the customer wants to have a waitperson that is attentive, yet not overbearing. This is especially the case when customers are having a business meeting while dining. Diners do not want to hear the constant nagging of the waiter/waitress every few minutes asking "Would you like a refill on your drink?" and "How is everything doing?" Restaurant patrons would like to have control over their dining experience, so they can get everything they need at the right time and in the right manner.

How Big the Problem Is

When a person chooses to dine at a restaurant, they wish to be served and enjoy themselves; however, this is not always the case. There are many facets of the restaurant industry that can cause customer dissatisfaction.

Waiters and waitresses are supposed to serve customers and make sure that they enjoy their experience, but this is typically not the case. The problems start with the fact that waiters/ waitresses usually have several tables to wait on with a total of about 20 people, and they need to make sure that all 20 people have everything that they have requested in a timely fashion. It is impossible for a waiter/ waitress to be one hundred percent attentive to all of their customers, at the same time.

When a customer places an order for a specific selection, the waiter/ waitress has to make sure they know exactly what the customer wants. They need to know if the customer would like items omitted or substituted as well as any other special requirements. The wait staff needs to be able to describe every item on the menu to the customer, which could cause a problem because they might not know the ingredients of every item that the restaurant serves. Because the member of the wait staff cannot dedicate themselves fully to one particular customer, the order is usually not correct. One reason for this is because they simply have too many tasks to complete at once such as placing orders, getting refills, taking care of bills, etc. They are not able to monitor each table carefully to see if someone needs a refill on a drink and immediately replace their drink. Excellent customer satisfaction is not possible.

There is an additional problem when a customer is not satisfied with his/her order. The kitchen has to correct the problem, which involves making a new selection and throwing out the old selection. This is not only a waste of food, but the restaurants also lose profits.

Once a customer finishes his/her meal, he/she wishes to pay his/her bill and proceed with their planned activities, but sometimes this simple task can pose a problem. The problem arises when a customer's bill is incorrect, the method of payment is complicated (i.e. the bill needs to be split among several people/parties) and/or getting the bill takes a long time. This causes a problem because the customer will remember their negative experience and will not go back to the restaurant because they feel that the waiters/ waitresses were not attentive enough.

This is especially a problem for customers who have an important business meeting or tickets for an event right after their meal. If they have to wait for their check or for a mistake to be corrected on their bill, they will be late. If this occurs, customers will become very upset and frustrated. They will remember their experience in the future and chances are they will not dine at the restaurant again.

If a customer has a bad experience at a restaurant due to the fact that they feel he/she did not receive adequate attention and/ or service from their waiter/ waitress, the restaurant could receive negative press. Customers will tell their family, friends, business partners, etc. about their experience, which would cause the restaurant to lose business.

The problem is not just an issue of customers sending back their selections or having to wait for their check. It is about customers not getting what they ordered, having to be inconvenienced and the restaurant losing profits. Customer satisfaction is the goal of every restaurant. When it is not achieved, the restaurant faces several issues that need to be address.

How the Problem is Currently Addressed and Why These Methods are Inadequate

The root of all service related issues in the restaurant industry can be linked back to the managers or owners. The service requirements set by the management need to be strictly enforced. If they are not, in most instances, the quality of the service will decrease. After working at an establishment for a substantial amount of time, the wait staff figures out what short cuts can be taken without being reprimanded by management. In the majority of instances, those shortcuts reduce the quality of the customer service.

Sit down restaurants can be broken down into two different categories: privately owned restaurants and chain restaurants. Privately owned restaurants typically have more attentive owners, who are usually also the managers. These individuals pay more attention to making sure the service at their restaurant is up to par. If not business will decline, and the lack of revenue will directly affect the owners. On the contrary, managers of chain restaurants are paid on a salary basis and a lack of revenue does not directly affect them.

The management of any restaurant should be providing each member of the service staff with a procedure for every detail of waiting on their customers, from placing the napkins on the table so the logo faces the guests to a script for saying goodbye. It is simply not enough to just teach the procedures, they have to be enforced. Although it is nice for each member of the wait staff to have his/her own unique twist to these procedures, it is necessary for all of the procedures to be enforced. When the procedures are not enforced, the level of customer service satisfaction decreases.

The major issues with customer service arise when the management at chain restaurants does not enforce the procedure guidelines. Because procedural requirements are not enforced, the wait staff has a tendency to slack off and only do what is required to get through their shift. When dining at a restaurant a customer expects the best service. Often times this type of service is not noticeable: an empty plate disappears, but the customer never sees anyone clear it; a wine glass or coffee cup is refilled without a request, almost as if by magic. The training for this standard of

service is not seen in chain restaurants. For example, although soft drink refills are free at a majority of these types of restaurants nine times out of ten you have to ask the waiter or waitress for a refill.

There are a number of things that can go wrong in a chain restaurant dining atmosphere that would contribute to dissatisfied customers. Receiving the wrong order, waiting a long time for their food and waiting for a member of the wait staff are only some of the factors that contribute toward customer dissatisfaction. When customers have issues with their service, they may wish to complain to a manager. When speaking with the manager, the customer may be offered some type of compensation such as a deduction from their bill or gift certificates to entice them to return. Addressing the customer service issues in this manner does not allow for better service for that visit, just an incentive to return to use the free gift certificates.

For example, Mary and John went out to lunch at a chain restaurant during their hour-long lunch break from work. The couple sat down and ordered immediately, telling their server they were on a tight schedule. Twenty minuets went by and the salads had not yet arrived, so Mary attempted to get the attention of the wait staff. However, only the person who took the order could check on the status and he/she was nowhere in sight. After finally spotting the wait staff member, Mary called him/her over and inquired about the status of their salads. At this instant the wait staff member realized she forgot to put the order in and replied, “They should be out any minuet now.” Then the wait staff member disappeared again. A few more minutes passed and they still did not have their salads, so Mary and John decided to leave since they would not have time to eat their meal. On their way out of the restaurant, the manager asked how their meal was. Obviously he had no idea they had waited so long and had not even received their meal. John told the manager that even though they had been in the restaurant for a half an hour they had not eaten anything. The manager then immediately apologized and offered to either expedite the order or offer a gift certificate for a return visit.

The majority of cases follow this pattern: nothing is done to correct customer dissatisfaction until it is too late. Although complaining may show results, it will not increase the overall dining experience, because that final contact with the manager usually does not make up for the poor experiences earlier in the dining process.

Only dealing with customer related problems when a customer complains is an ineffective way to provide an enjoyable dining experience for guests. It does not show any initiative being taken by the establishment to correct its flaws. In an instance when a member of the wait staff is not providing adequate customer service, the management should be able to notice immediately. They should correct the problem before it affects anymore of the customer’s dining experience. Attentive managers who enforce the procedure guidelines and pay attention to their wait staff are able to better control the customer satisfaction level, thus producing a better dining experience and loyal customers.

Preface to Process Maps and Data Organization

Process Map Layout

Both processes and decisions exist on the process map. A rectangular box indicates processes, while decisions are represented as diamonds. Each is numbered accordingly; processes just contain a number (i.e. 1), while decisions contain a capital letter "D" before the number (i.e. D1). There are three classes of action (process) executors on the map: "Customer," "Waitperson," and "Cook/ Preparer" Each is accompanied by a vertical region that corresponds to actions preformed and decisions made by each class of people. For example, the first process is a rectangle and is located in the "Customer" region; this means that the customer takes an action.

There are a few terms that need clarification when referring to the process maps and the data that is organized into tables and a database. When restricting some of the actions taken (i.e. paying for portions of an order by different methods), this action is simply restricted for database purposes. It may or may not be within the scope of capabilities for both the restaurant and the AWS.

Table Names and Relation Explanations

Customer refers to a single person visiting the restaurant to dine. There may be many customers at a table, even if they are in the same family

Table refers to the location where the customer eats. For simplicity's sake, we will assume that in parties that contain a large number of customers, only one table will be used; multiple tables that are pushed together to accommodate these parties will be considered as a single table.

A *Reservation* is an associative entity that refers to a particular date and time that a customer visits the restaurant to dine. It makes no distinctions between prior notification and assurance of seating (i.e. when a customer calls a restaurant in advance), and a customer that has just walked in the door. A single customer may have many reservations because he/she may visit the restaurant multiple times, even possibly in the same day. Each time the customer visits is a different reservation or seating. Conversely, each reservation may have multiple customers if there is more than one person eating together at the same time.

A *Waitperson* is the person, male or female, that works in the restaurant and delivers selections to the customer. In a traditional restaurant before the AWS system, a waitperson also takes orders. A waitperson may wait on many tables throughout his/her shift, and a single table may have many waitpersons at various times. A *Reservation* associates these two by assigning a date and time. In this way, a table may only have one waitperson at a time. Similar to assigning only one table to large parties, this large party rule holds true for waitpersons as well.

The whole concept of a restaurant relies on people ordering food. A single food or drink shall be referred to as a *Selection*. An example of a selection is a turkey wrap, a glass of orange juice, or a steak.

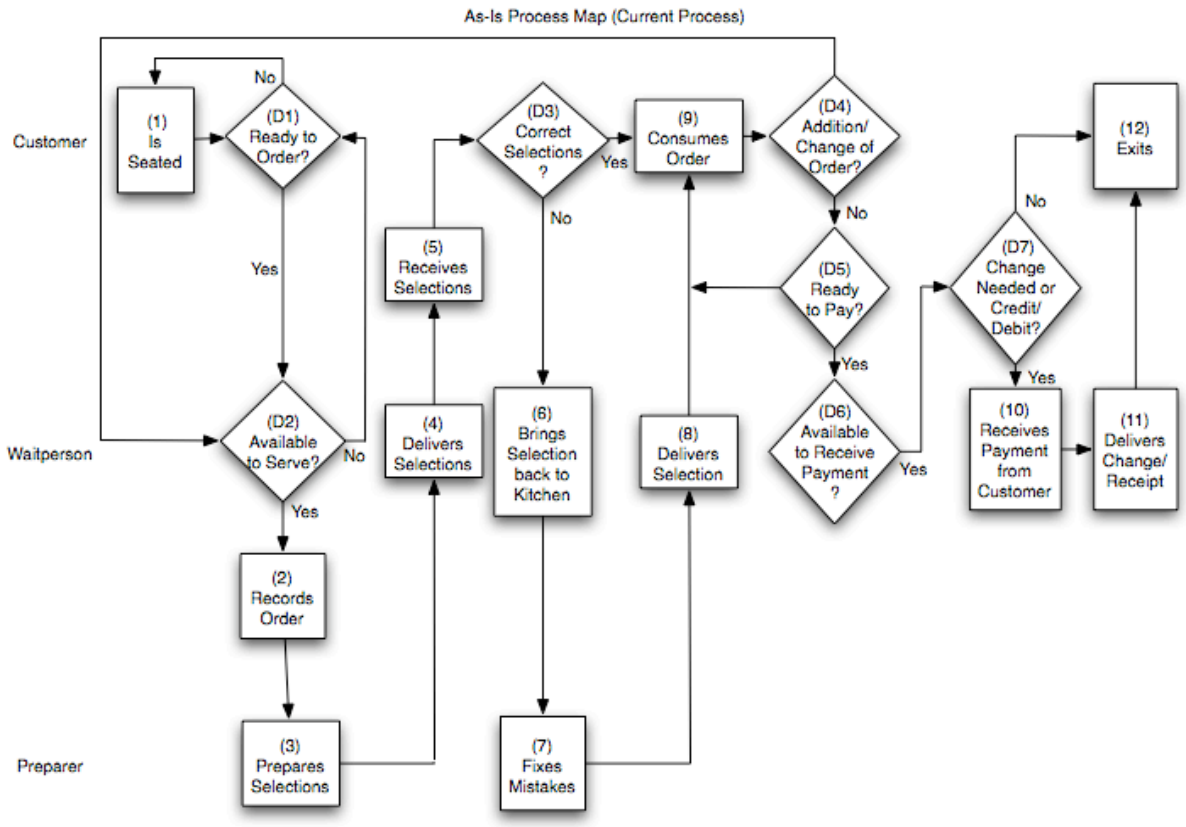
As we all know, when customers visit a restaurant, they order many selections during the course of their reservation; perhaps they might have a drink along with an appetizer and entrée. To clarify this in our system and terminology, the composition of all the selections shall be referred to as an *Order***.** Each customer places only one order at each reservation time. For example, I place my order of mozzarella sticks, water, and a chef salad. I may change the components of my order (these different components are the different selections), or make additions and subtractions to it at any time. Because each customer places his/her own order, there may be multiple orders per reservation.

Order Details is another associative entity that fixes a many to many relationship between orders and selections. As stated above, a single order may contain many different types of selection, or many of the same selection. A selection can be placed in many orders (i.e. steak is ordered by many customers and multiple steaks are made throughout the day) also. To remedy this, order details are set up to explain a single order by the customer. It also deals with which preparer prepares the selections, the quantity of each selection in an order, and whether or not a selection in the order is made correctly.

A *Preparer* is someone that literally makes or prepares a selection. This can be a chief that cooks food, or a bartender that prepares a drink for the customer. One preparer may prepare many selections throughout the course of his/her shift. For simplicity's sake, let us assume that: one preparer can only prepare one selection at a time (a cook cannot make two different selections at once), and each selection associated with a single order is only prepared by one preparer (two cooks may not work on different parts of the same selection i.e. one makes the rice and one makes the steak). Conversely, one selection may be prepared by multiple preparers (now Jim will make all of the turkey sandwiches, but later it will be Susan's job). *Order Details* takes care of this relationship between preparer and selection by assigning a date and time that each selection is prepared.

Payment refers to the way customers purchase the selections and services of the restaurant. In the process map, there is a distinction of classes of payment: debit/credit, and non- debit/credit. Non-debit/credit methods of payment include cash and a personal check. Customers may choose to pay with different methods of payment at different reservation times (paying with cash today and by credit card tomorrow), and also may pay for a single order by using multiple methods (pay for a portion of one order on a credit card and pay the remainder in cash). Customers may also pay for each other's orders or portions of their orders (one man buying dinner for a woman, a parent buying for his/her family, or arbitrary splitting of bill amounts). This poses a slight problem for making a database, so we will assume that only one method of payment can be used for each bill. *Bill* is an associative entity created to establish a relationship between order and payment. Unfortunately, a many-to many relationship still exists between *customer* and *reservation*.

As-Is Process Map



As-Is Process Map Explanation (Current Process)

1. A customer (restaurant patron) enters the restaurant and is seated at a table. The customer is presented with a menu, which he/she then begins to read. This step is accompanied by a small wait time (one to five minutes from the time the customer is seated until he/she receives a menu).

D1. After reading the menu over, the customer decides on an order they wish to place. If the customer is not ready to order, he/she will keep looking at the menu until he/she is ready. If the customer is ready, he/she is ready to move to Decision Two.

D2. After deciding on an order, the customer needs to get the attention of the waitperson in order to place the order. This step is often accompanied by a significant wait time; the length of the wait is dependant upon how busy the restaurant is and how busy the waitperson is. If a waitperson is not available at the time the customer is ready to order, the customer will continue to wait until one becomes available. If a waitperson is available, the process will proceed to Step Two.

2. At the time the waitperson is available to attend to the customer who has decided on an order, the waitperson will record this order. Sometimes the order will be simple enough,

or the waitperson will be experienced enough, to take this order and memorize it. Most of the time, the waitperson will write the customer's order down on a piece of paper. After this, the waitperson will submit the customer's order to the kitchen or bar. This may happen via a simple submission of the paper the waitperson took the order on, or it may happen through a computerized entry of the order that gets sent to the kitchen or bar.

3. After the order is sent to the preparer, he/she prepares the selections that were ordered. This step is the one that usually takes the most time to complete. The wait time for the customer depends on the complexity of the order, the talent of the cooks and bartender, and how busy the restaurant is.

4. The waitperson is notified when the selections are complete, usually by verbal communication, and he/she then brings the order to the customer.

5. The customer receives his/her selections from the waitperson.

D3. The customer assesses the correctness of the selections. If the customer decides the selections are incorrect in any way, the process will regress to Step Four. If the customer is satisfied with the accuracy of the selections, the process will skip to Step Eight.

6. The waitperson brings the incorrectly made selection to the preparer and explains the problems.

7. The preparer fixes the mistakes, which may take a few minutes. The preparer then notifies the waitperson in the same manner as before to signal the selection is ready.

8. After determining the selection is correct, the customer consumes the selection.

D4. Usually there are many courses served during a meal (drinks, appetizer, entrée, coffee and desert). If the customer at any time finishes one of these and wishes to place an order for the next course, the process will regress to Decision Two (assuming the customer has not included the selections for each course in his/her initial order). If the customer does not wish for anything else, the process will continue to Decision Five.

D5. This is the step in which the customer decides if he/she is ready to pay. This step usually occurs after the customer has finished his/her meal, or is about to finish. Once the customer is ready to pay, the process will move on to Decision Six.

D6. This is the step in which the customer attempts to catch the attention of the waitperson. This can take usually anywhere from one to 10 minutes. Once the waitperson is available to accept payment, the process will advance to Decision Seven.

D7. The customer needs to choose a method of payment. There are many different ways to pay. If the customer decides to pay with a credit card, debit card, etc. or is paying cash and will need change, the process moves on to Step Nine. If not, (payment is cash without needing change or a personal check, etc.), this type of payment does not require the

waitperson to make any trips. All the customer needs to do is leave the payment on the table. The process will skip to Step 11.

9. At this time, the credit/debit card or the cash needing change payment is received by the waitperson. These types of payment require the waitperson to either check the credit of the payment card, or make change for the customer. These types of payments are grouped together because they require the waitperson to make another trip to and from the customer's table. This will add a few more minutes to the overall process time.

10. The waitperson makes change or processes the credit/debit card and delivers this back to the customer.

11. After successfully completing payment for the restaurant's service, the customer is free to exit the restaurant.

II. Proposed Solution

Three Potential Solutions

1. A Call Button

This solution would place a button in the guest's dining area so that the customers could easily get the attention of the wait staff. It would be a simple device, much like a call button on an airplane. The simple button would sit somewhere on the table, thus allowing for quick immediate access. It would be used to get the attention of the wait staff whenever the customer needs them. Instances in which the customer would press the button include when they are ready to order their meal, if they need a drink refill, if they received a wrong order and when they are ready to pay. As soon as the button is pressed the wait staff would be alerted via a central processing location, thus eliminating the problem of getting the attention of the wait staff. This location would be convenient for the entire restaurant, which causes a problem. The wait staff would have to refer to the location in order to find out which tables needed assistance. Also the wait staff may not know the order in which the requests were made, thus customers may end up waiting longer than intended. Even with the call button the wait staff may not be able to get to a customer immediately. There could still be a significant wait time as the wait staff could be busy at that moment in time. Aside from having to wait for a member of the wait staff to attend to the table after the button is pressed, there are a number of other problems customers still encounter when using a call button. For example, a customer's order could still be incorrect because there could be a miscommunication between the customer and wait staff. As a result, the customers still have to wait for their bill.

2. Ordering Online Before Dining at the Restaurant

Over the years, the Internet had become a vital part of the majority of individuals' lives. This solution would allow customers to go online before departing for the restaurant and place their order via the Internet. The customers would go to a website designed by the restaurant which would list the full menu including prices and pictures. This would allow individuals to customize their order and make special requests. Even though the orders would be made to the customer's specifications, once at the restaurant, they still have the problem of getting the attention of the wait staff when needed. Customers would also have to wait for requests such as drink refills and

the check. There are several other problems with this system of ordering. The customer could arrive at the restaurant, and they could be out of a particular item ordered. The food may not still be fresh if it takes a long time for the customer to get to the restaurant. If the order has already been prepared, there is little or no flexibility in changing the order. Also, the website would have to be continuously updated to reflect specials being offered by the restaurant as well as changes to the menu. With this solution problems also arise for the restaurant. The restaurant has to be able to make an estimation of when the customers will arrive in order to have their food prepared.

3. Automated Waiter System (AWS)

The Automated Waiter System (AWS) is a device that will be placed at each individual place setting in the restaurant. The device will have a touch screen displaying an array of menus to help make the customer's dining experience more enjoyable. Some of the options on the AWS units include a detailed menu, a drink refill request, a help request, and automatic payment through the system. When the customers are seated, they will be able to place orders at their leisure. AWS will enable customers to not only see the full menu but also color pictures of each item, along with its price. Being able to see the menu on the visual display screen will enable customers to make modifications to their orders, thus receiving exactly what he/she ordered. Another feature of AWS is a quick drink refill button, which will order another drink with just one button. There will also be an assistance button that will call a member of the wait staff over to the table to help customers who are having trouble operating the system. When the customers are ready to pay, the AWS will also be of service. AWS will include a payment option that will let the customers pay by credit card without having to wait for the wait staff to process the credit card. Paying with cash is also an option. If the customer wishes to pay this way, they can alert the wait staff via the AWS to come and collect the cash, returning with change if necessary. AWS will truly walk customers through every process of the dining experience, making it more efficient and thus increasing customer satisfaction.

The solution selected is the third one: the Automated Waiter System (AWS). This choice combines the first two solutions; however, it is more effective. One of the many features of AWS is the assistance button, which is the same as the first proposed solution. AWS also allows customers to order their selections themselves, so they would be able to view their selections and make chances in a similar way as the Internet. AWS allows customers to be in control of their dining experience.

Why the Solution Selected is Superior to Current Available Solutions

When customers decide to dine at a restaurant, they face many problems that may make their experience less enjoyable. Restaurants are trying to correct these problems and increase customer satisfaction. Currently, there is not a complete solution that solves all of the problems restaurant patrons face. Although there are several mediocre solutions, none of them are all encompassing and address the many facets of the dining experience.

One solution would be to hire additional hosts/ hostesses to monitor tables more frequently in order to seat customers as soon as possible. That might seem like a good idea, but one person

cannot carefully monitor numerous tables at once. This idea only solves one problem of the dining experience and is not an effective option for the restaurant industry.

In terms of service, as it relates to the meal, restaurants could hire more waiters/ waitresses in order to reduce the amount of tables each server is responsible for. This would allow the wait staff to devote more attention to each of its customers.

Currently, there is no way efficient way to deal with the issues of incorrect orders. One suggestion would be to have customers place their order online before they go to the restaurant; however, customers do not always know where they will be dining ahead of time and therefore cannot place their order beforehand.

Even though both of those solutions are good ones, they are not permanent, and they do not effectively solve the problems at hand. They also have negative affects on the restaurant because they increase the amount of money that the restaurant needs to pay for the additional staff members.

Our solution, the Automated Waiter System (AWS), is the most comprehensive solution. It addresses all of the problems that customers face when they decide to dine at a restaurant. It takes into account the whole dining experience from the time a customer enters the restaurant until he/ she leaves. The primary goal of AWS is to increase customer satisfaction.

When a customer first enters the restaurant, the host/ hostess makes sure that the customer is seated as soon as there is an available table. Each AWS unit is linked to the main computer at the host/ hostess stand, thus they can ensure that customers are seated as soon as possible by monitoring the statuses of the tables. This way there is no room for error such as tables not being cleared when a patron is seated. It will also allow customers to have a better estimate as to when they will be seated, if there is a wait time.

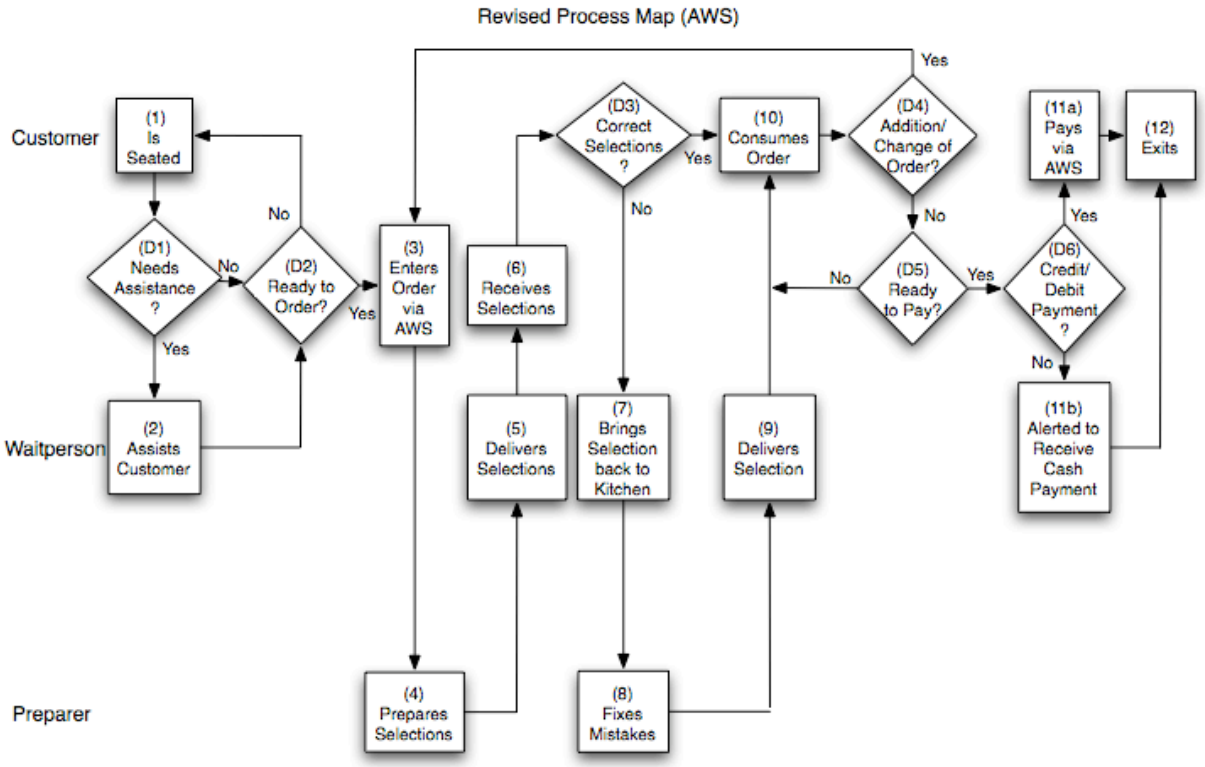
Once the customers are seated, AWS will allow them to have complete control of their dining experience. They will be able to order whenever they wish and make any modifications such as a substitution or addition of an item to their dish as well as providing specific instructions. Customers will be able to view the entire menu that includes pictures, dietary ingredients and nutritional facts for each item.

Since customers will have the ability to place their own orders, there will be fewer errors in the kitchen and less food will be wasted. The customers will not be dependent on the availability and/or attention of their waitperson. The waitperson will only be responsible for making sure refills; food and any cash for bills are brought to the table. They will only need to take care of tasks when the customer requests it through the AWS. When a customer does need a waiter/ waitress, they will be able to answer every detailed request because they do not have to focus on handling every aspect of the meal for multiple tables. The waitperson will be able to focus more on each individual customer. The dining experience will be catered to making sure the customer’s every need is fulfilled and that they are served in a timely fashion.

When it comes to the end of the meal, AWS will allow a customer to review their bill and pay for it without the assistance of a waitperson. If he/she is paying with cash, then a person from the wait staff will be notified through AWS to help the customer settle their bill. AWS allows a customer to pay their bill at their leisure; they are not dependent on the wait staff to receive and pay for their check.

AWS is the best solution to resolve the issues that patrons face when they decide to dine at a restaurant. It allows a customer to be in control of their meal and make sure that they have everything that they need and/or desire. It ensures that customers get the best experience out of their restaurant visit.

Revised Process Map



Revised Process Map Explanation (including Information Requirements)

1. A customer (restaurant patron) enters the restaurant and is seated at a table. The customer is prompted to optionally disclose his/her name and some other basic information. The customer is immediately presented with a menu in the form of the AWS; there is no wait time.
    - Collected/Captured- Information about the customer is collected (name, where the customer is from, etc.).
    - Conveyed- Menu options and prices are conveyed to the customer through the AWS. If the customer is returning to the restaurant, his/her preferences, usual orders, and recommendations will be conveyed to him/her at this point.

- Cradled- This information is stored for later use by the management. It is also remembered by the system for return visits by the customer.
- Created-
- Communicated-

D1. If the customer needs assistance with operating the AWS system, he/she will proceed to Step Two. If not, he/she will skip to Decision Two.
- Collected/Captured-
- Conveyed-
- Cradled-
- Created-
- Communicated-

2. When the decision has been made that the customer needs assistance with using the AWS, or for any other reason, he/she will use a call button/ help function on the AWS to immediately alert a member of the wait staff. The wait time for the customer on this step is minimal; the waitperson immediately knows where they are needed. The only reason why there may be a short wait is if the waitperson is busy at the moment. Once the customers issues have been handled by a waitperson, he/she will move on to Decision Two.
- Collected/Captured-
- Conveyed-
- Cradled-
- Created-
- Communicated- The AWS will communicate to a waitperson by alerting him/her, via a pager, that his/her assistance is required, and where (which table).

D2. After looking at the menu choices by using the AWS, the customer needs to decide if he/she is ready to order. If the customer is ready, he/she will advance to Step Three. If not, he/she will keep looking at the menu until he/she is ready.
- Collected/Captured-
- Conveyed-
- Cradled-
- Created-
- Communicated-

3. The customer inputs his/her order into the AWS by choosing one or more selections, including any special requests, additions, and omissions to these selections. After confirmation from the system, the order is sent directly to the kitchen to be prepared. There is no wait time associated with this step. It will take just as long as the customer takes to enter his/her order.
- Collected/Captured- Order info is collected by the AWS (which selections were chosen, selection quantity, selection omissions, the time and location of the order, etc.).
- Conveyed-
- Cradled- This information is stored for later use by the management.

- Created-
- Communicated- The order is communicated to the kitchen or bar via AWS so it can be prepared.

4. After the order is sent to the cooks or bartender, they complete the order by cooking the food or preparing the drink. If the order contains multiple selections, these selections are prepared at the appropriate time. This step is the one that usually takes the most time to complete. The wait time for the customer depends on the complexity of the order, the talent of the cooks and bartender, and how busy the restaurant is. When the selections are completed, the wait staff is notified by AWS, via pagers.
    - Collected/Captured- The time the order was placed and the time each selection is completed will be recorded by the AWS.
    - Conveyed-
    - Cradled- This information is stored for later use by the management.
    - Created-
    - Communicated- The wait staff is notified by AWS that the order is ready to be delivered to the customer.

5. The waitperson is notified automatically by the system when the selection is complete and then brings the selection to the customer. The wait time for the customer is minimal.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated-

6. The customer is presented with his/her selection(s).
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated-

D3. After Step Six, the customer needs to decide if his/her order is correct If the order is not correct, the process will move on to Step Seven (the waiter will communicate the problem to the cook personally, and the customer will also use the AWS to record which selection was prepared incorrectly). If the customer is satisfied with the selections he/she has received, the process will proceed to Step Ten.
    - Collected/Captured- Information concerning correctness of the order is collected by AWS. This information is binary (correct or not correct), and a non-response is assumed to be a correct order.
    - Conveyed-
    - Cradled- This information is stored for later use by the management.
    - Created-
    - Communicated- If the order is not correct, this is communicated to the kitchen or bar by using the AWS.

7. The waitperson is notified through AWS, via pagers, that there is a problem with a selection, and immediately responds to the customer. The waitperson takes the incorrect selection back to the kitchen and personally communicates the specific problem to the cook/preparer.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated-

8. The cook/ bartender/ preparer fixes the mistake made. This may take a short amount of time or a long time, depending on the mistake made and solution chosen by the cook/preparer. When the mistake has been corrected, a waitperson is notified via AWS.

    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated- The waitperson is notified when the selection is ready for delivery to the customer again.

9. The waitperson delivers the correct selection to the customer.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated

10. The customer consumes the selections he/she has ordered. This step takes a while, but is dependant wholly on the customer.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated

D4. Because an order contains multiple selections, the selections will be delivered to the customer at an appropriate time. If the customer wants to change, add, or cancel something to his/her order, the process will regress to Step Three with the new details of the order being input into the AWS. If the customer does not wish to change anything, the process will continue to Decision Five.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-

- Communicated

D5. This is the step in which the customer decides if he/she is ready to pay. This step usually occurs after the customer has finished his/her meal, or is about to finish. Once the customer is ready to pay, the process will move on to Decision Six.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated

D6. At this point, the customer selects a payment option. If he/she is paying with a credit/debit card, he/she will indicate that through the AWS, and the process will advance to Step 11a. If the payment method is cash or personal check, the process will move to Step 11b after indication has been made through AWS.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated

11. Payment Step

    a. A credit/debit card payment is processed through the AWS. The customer swipes his/her card and signs electronically using the stylus. A receipt is printed, and the customer may move to Step 12.
        - Collected/Captured- Payment information is collected (amount of payment, date and time of payment, type of payment).
        - Conveyed-
        - Cradled- This information is stored for later use by the management.
        - Created- Payment information is linked to customer information. Also a total bill amount is calculated in this step by adding up all of the orders during the course of the meal.
        - Communicated- Successful payment by the customer is communicated to the wait staff to alert them that the customer may be leaving shortly.

    b. If the customer is paying in cash or with a personal check, a waitperson is immediately notified by the AWS. The waitperson then will come to pick up the payment and make change if needed. This step will require more time to complete than Step 11a. After payment is done, the customer can move on to Step 12.
        - Collected/Captured- Payment information is collected (amount of payment, date and time of payment, type of payment).
        - Conveyed-
        - Cradled- This information is stored for later use by the management.

- Created- Payment information is linked to customer information. Also a total bill amount is calculated in this step by adding up all of the orders during the course of the meal.
- Communicated

12. After successfully completing payment for the restaurant's service during his/her reservation time, the customer is free to leave the restaurant.
    - Collected/Captured-
    - Conveyed-
    - Cradled-
    - Created-
    - Communicated

Types of IT Systems Required

Transaction Processing System (TPS) – This system processes the transactions between the customer and the kitchen as well as between the customer and the wait staff.

This system is the most important system as it processes all of the transactions that occur between the customer and the restaurant. The system can also help to keep track of all the transactions in the database, allowing the restaurant to access them later to analyze the business transactions.

The system tracks the following four data processing tasks:

1. The transaction begins when the customer sits down at the table and orders their drink, and possibly their appetizer and/or entrée. This could also happen after they have received their drink order. (Capture transaction information)
2. The computer accepts the information and separates it by part of the meal, as well as by which person orders which items. (Creates information)
3. The customer is then made aware of the final cost of meal with a receipt that is printed through the device. (Convey information).
4. The consumer can then pay for the meal with a debit/credit card by using the swipe mechanism on the device, or pay with cash with the help of a person on the wait staff. If payment is made with a debit/credit card, the computer can retain debit/credit card sales that way. (Cradles information in database)

Management Information System (MIS) – This system imparts reports to the management at predetermined intervals of time that summarize the information that is stored in the database.

This system is vital to the success of the restaurant as it tells the management if business is being maximized or if something needs to be done to improve business, using the data from the Transaction Processing System (TPS). It is responsible for retrieving the data from the TPS allowing the management to formulate reports on how restaurant operations are going.

The Management Information System helps to create the following types of reports:

1. Periodic Report- This report is created at pre-determined times by the management. Information in this report includes the popularity of items on the menu, total sales, profits, and costs in an easy to read format.
2. Summarized Report- Condenses information from the periodic report. Reveals such information as customer's preferences of payment method, meal choice, and beverage choice.
3. Exception Report- Displays a subset of the information stored in the database based on criteria input into the system by the person/s retrieving and interpreting the report. This report helps to find voids in the stored information in the database as well as track loyal customers.
4. Comparative Report- Illustrates multiple subsets in an attempt to illustrate a relationship. For example, a comparative report that a restaurant may want to look at is the relationship between customer volume and the time of day.

III. Implementation of Solution

Hardware and Software Required

For Capture:

Product	Usage	Cost	Where to get It
Table Pocket PC*	Browsing the menu, as well as ordering and paying for the food	200 units at $300.00 each	Microsoft.com[1]
Host Computer (Elo Touch 1529L)	Keeping waitlist and reservation list as well as displaying available tables	1 unit at $1,499.00 each	Elotouch.com[2]
Office Computer Keyboard	Inputting information into the computer	Included with office computer	Dell.com

In a restaurant atmosphere, there are three locations that would capture information: the host stand, the individual AWS units, and the office computer. The host computer would be used to input the customer information upon arrival. Having the customer information in the system allows determination of wait times as well as the ability to store customer preferences. For this capture device, we choose the EloTouch 1529 L, which is a computer with a touch screen monitor. This product can be purchased directly from EloTouch for $1,499.00. The second, and most critical, capture unit is the AWS unit. For this unit, we selected to use a Pocket PC device. This device will not only capture the customer's menu options but also capture the customer's credit card information at the end of the meal. The AWS units can be purchased from Microsoft for $300.00 each. The final capture device needed is a keyboard for the office computer. This

[1] http://www.microsoft.com/windowsmobile/pocketpc/default.mspx
[2] http://www.elotouch.com/Products/Computers/1529LTC/default.asp

keyboard will allow the restaurant staff to input the menu options into the system. The keyboard will be included with the office computer purchased from Dell.

For Convey:

Product	Usage	Cost	Where to get It
Kitchen Monitor (ViewSonic Q171b)	Viewing orders	1 unit at $191.43 each	Bestbuybusiness.com[3]
Bar Monitor (ViewSonic Q171b)	Viewing orders	1 unit at $191.43 each	Bestbuybusiness.com[4]
Host Computer (Elo Touch 1529L)	Keeping waitlist and reservations list as well as displaying available tables	*Already in capture	Elotouch.com
Table Printers (Epson TM-U220PD)	Printing out customer's receipt	50 units at $181.00 each	Posworld.com[5]
Master Printer (HP Laser Jet 3050)	Printing out restaurant reports, other computer documents	1 unit at $299.99 each	Hp.com[6]
Table Pocket PC*	Browsing the menu, as well as ordering and paying for the food	* Already in capture	Microsoft.com

All of the information, captured by the various devices, needs to be conveyed. The information captured by the host computer is relayed back to the monitor on that computer. The hardware required for that capture is the same as the hardware required for convey. The information inputted by the AWS unit has to be conveyed to either the kitchen or the bar, depending on the order, so the order can be assembled. Both of these monitors will be ViewSonic Q171b. They can be purchased from Best Buy Business for $191.43 each. The information captured by the

[3] http://www.bestbuybusiness.com/bbfb/en/US/adirect/bestbuy?cmd=catProductDetail&showAddButton=true&productID=BB10668493

[4] http://www.bestbuybusiness.com/bbfb/en/US/adirect/bestbuy?cmd=catProductDetail&showAddButton=true&productID=BB10668493

[5] http://www.posworld.com/epson-tm-u220d-receipt-printer.html

[6] http://h10010.www1.hp.com/wwpc/us/en/sm/WF05a/18972-238444-410636-12004-f51-1140783.html?jumpid=oc_R1002_USENC-001_HP%20LaserJet%203050%20All-in-One&lang=en&cc=us

office computer keyboard is conveyed to the AWS unit. The information captured by the office computer can also be conveyed to the restaurant staff via the master printer. For this we choose the HP laser jet 3050. This device will convey the information on the screen to the restaurant staff, via printed documents. The other printers in the restaurant, the table printers, will convey a receipt to the customers at the conclusion of their meal. For this we chose the Epson TM-U220PD printer from posworld.com. These printers will be individually placed at each table and cost $181.00 each.

For Create:

Product	Usage	Cost	Where to get It
Main Server (HP ProLiant ML110 G3)	Storing information	1 unit at $634.99 each	Bestbuybusiness.com[7]
Productivity Software for Office Computer)	Processing office documents	Included in Office Computer Price	Dell.com
Operating System for the Office Computer (Microsoft Windows XP Professional)	Running the computer	Included in Office Computer Price	Dell.com
Office Computer (Dimension C521)	Conducting office tasks (word processing, internet browsing, etc.)	1 unit at $1,148.25 each	Dell.com[8]
AWS Software (Future POS)	Operating the AWS devices	1 unit at $11,000. each	Future POS[9]
Host Software (Future POS)	Operating the host's computer	Included in AWS software price.	Future POS

All of the information captured and conveyed needs to be stored somewhere. In our case, we are storing it on a main server, HP ProLiant ML110 G3, purchased from Best Buy Business for $634.99. All of the information inputted needs software in order for it to be processed. The information gathered by the office computer will be inputted by the productivity software, Microsoft Office 2003 Professional Edition, which includes Word, Excel, Access, and PowerPoint. The price for Office 2003 is included in the price of the computer. In order for the office computer to operate, an operating system is needed. In our system, we will be using

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http://www.bestbuybusiness.com/bbfb/en/US/adirect/bestbuy?cmd=catProductDetail&showAddButton=true&productID=BB10459763

8

http://www.dell.com/content/products/category.aspx/dimen?c=us&cs=04&dt=List&l=en&s=bsd

9 Information gathered from a personal interview with a Future POS authorized retailer.

Windows XP Professional edition. The price is included in the cost of the office computer. The computer itself, which uses the operating system and productivity software, is a Dell Dimension C521. This unit can be purchased from Dell for $1,148.25. The software for both the host computer and AWS will be Future POS. The cost for the software is $11,000. This cost includes not only the software, but also the installation of the units as well as the training required to master the system.

For Cradle:

Product	Usage	Cost	Where to get It
Storage Server (HP ProLiant ML110 G3)	Storing more information	1 unit at $634.99 each	Bestbuybusiness.com[10]
Database Software (FileMaker Pro 8.5)	Organizes the information	1 unit at $299.00	Filemaker.com[11]

At some point and juncture, the main server will become filled to capacity with information, and it will not be able to hold any more data. To solve this problem, we are implementing the use of a second storage server, a Hewlett Packard ProLiant ML1000 G3 server, which can be purchased at bestbuybusiness.com for $634.99. This server will store all of the older and less necessary information such as a customer's meal preferences, checks, as well as contact information, which could be used for sending out advertisements such as flyers or coupons. The software that the database will be built off of is FileMaker Pro 8, which will organize all of the captured information.

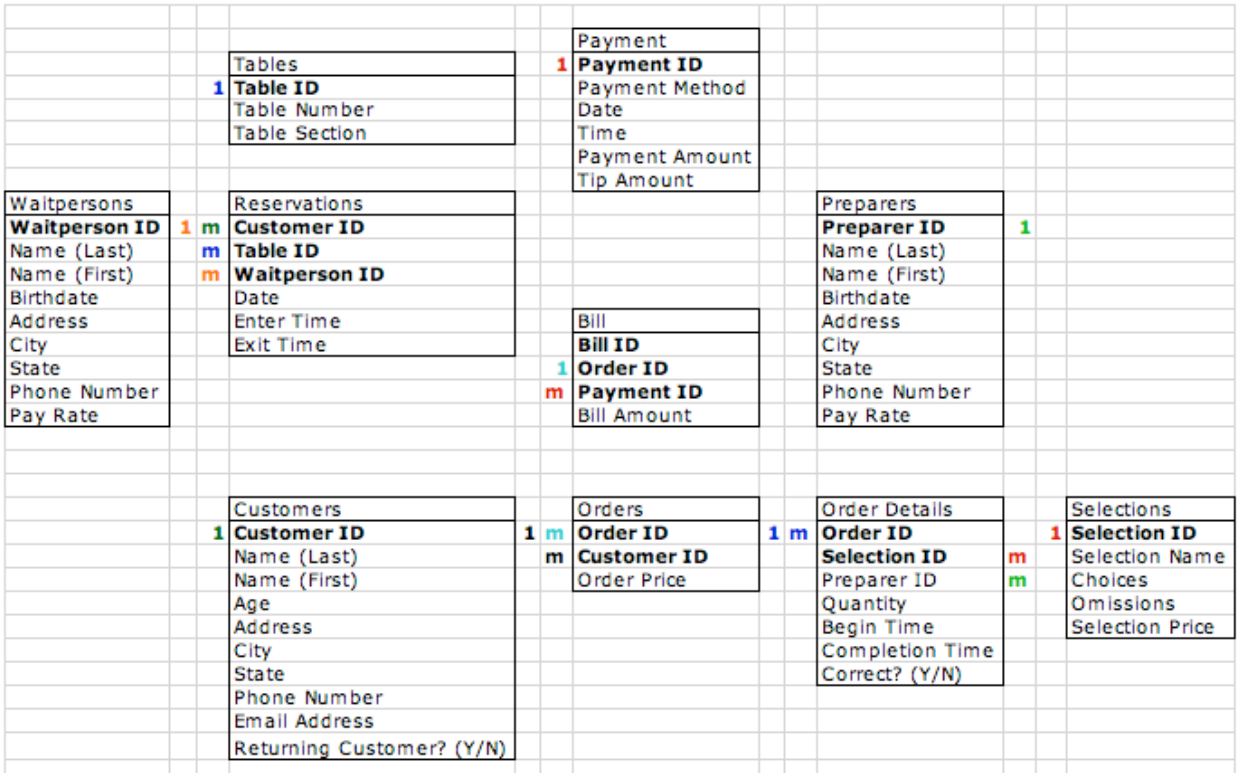
Entity Classes

Entity Classes	Primary Key (1) or	Composite Keys (>1)		Foreign Key
Bills	Bill ID	Payment ID	Order ID	
Customers	Customer ID			
Order Details	Order ID	Selection ID		Preparer ID
Orders	Order ID	Customer ID		
Payments	Payment ID			
Preparers	Preparer ID			
Reservations	Customer ID	Table ID	Waitperson ID	
Selections	Selection ID			
Tables	Table ID			
Waitpersons	Waitperson ID			

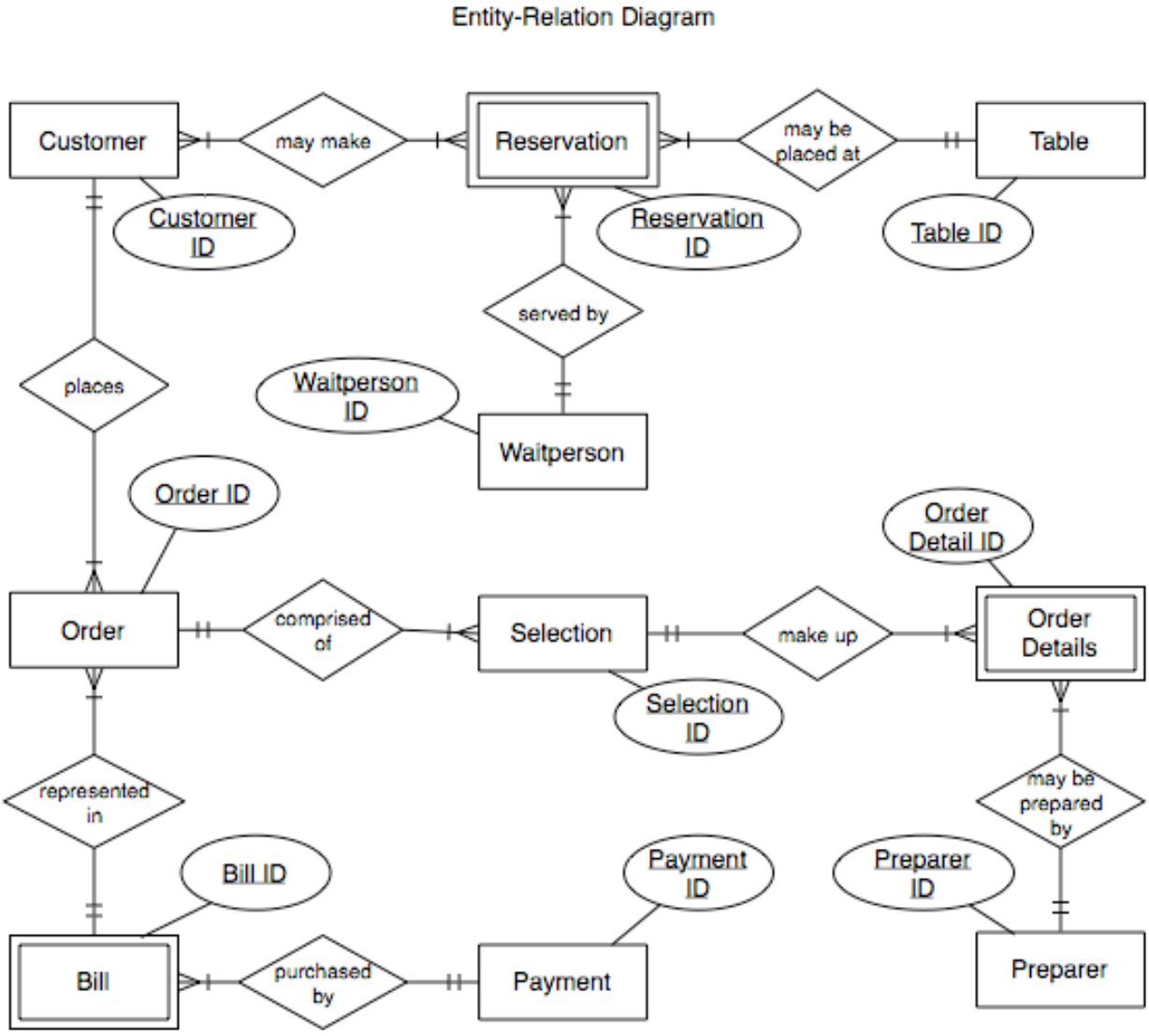
[10] http://www.bestbuybusiness.com/bbfb/en/US/adirect/bestbuy?cmd=catProductDetail&showAddButton=true&productID=BB10459763

[11] https://store.filemaker.com/

Relational Tables



Entity-Relation Diagram



For Communicate:

Product	Usage	Cost	Where to get It
Router with Firewall (Netgear WGR 614)	Sharing internet with all computers in the restaurant	1 unit at $39.99 each	Bestbuy.com[12]
Wait Staff Pager	Alerting the waiter/waitress when a table's order is ready	6 units at $149.00 each	Jtech.com[13]
High Speed Internet Connection (DSL)	Completing office functions requiring internet access	1 unit at $39.99 per month	Verizon.com[14]
Two Phone Lines for Credit Cards	Processing credit card information	2 units at $35.00 per month	Verizon.com[15]

All of the information in the system from the capture and the convey stages needs to be transmitted. For this to happen, the restaurant needs a high-speed Internet connection as well as two telephone lines. In order to keep things as simple as possible for the business, we will implement two phone lines as well as a business DSL from Verizon at a cost of $70.00 and $39.00 respectively. The phone lines will be used to process the credit card information of the patron from the AWS. Having two phone lines will guarantee the patron a problem free payment process. The internet connection from Verizon will allow all computers in the restaurant to access the internet to check business emails, conduct research, or complete simple office tasks such as paying bills and updating content on their website. In order for all computers in the restaurant to have an Internet connection, we plan on implementing the use of a Netgear WGR 614 router, which can be bought from Bestbuy.com for $39.99. This device, which connects to the DSL modem as well as the main computer and the phone jack, will allow all computers in the restaurant to gain access to the internet to complete numerous tasks without the need for multiple internet subscriptions. Finally, we will implement the use of wait staff pagers. These will be used to alert the waiters and waitresses when the food is ready to be picked up from the kitchen. They can be purchased from jtech.com at a cost of $149.00 each.

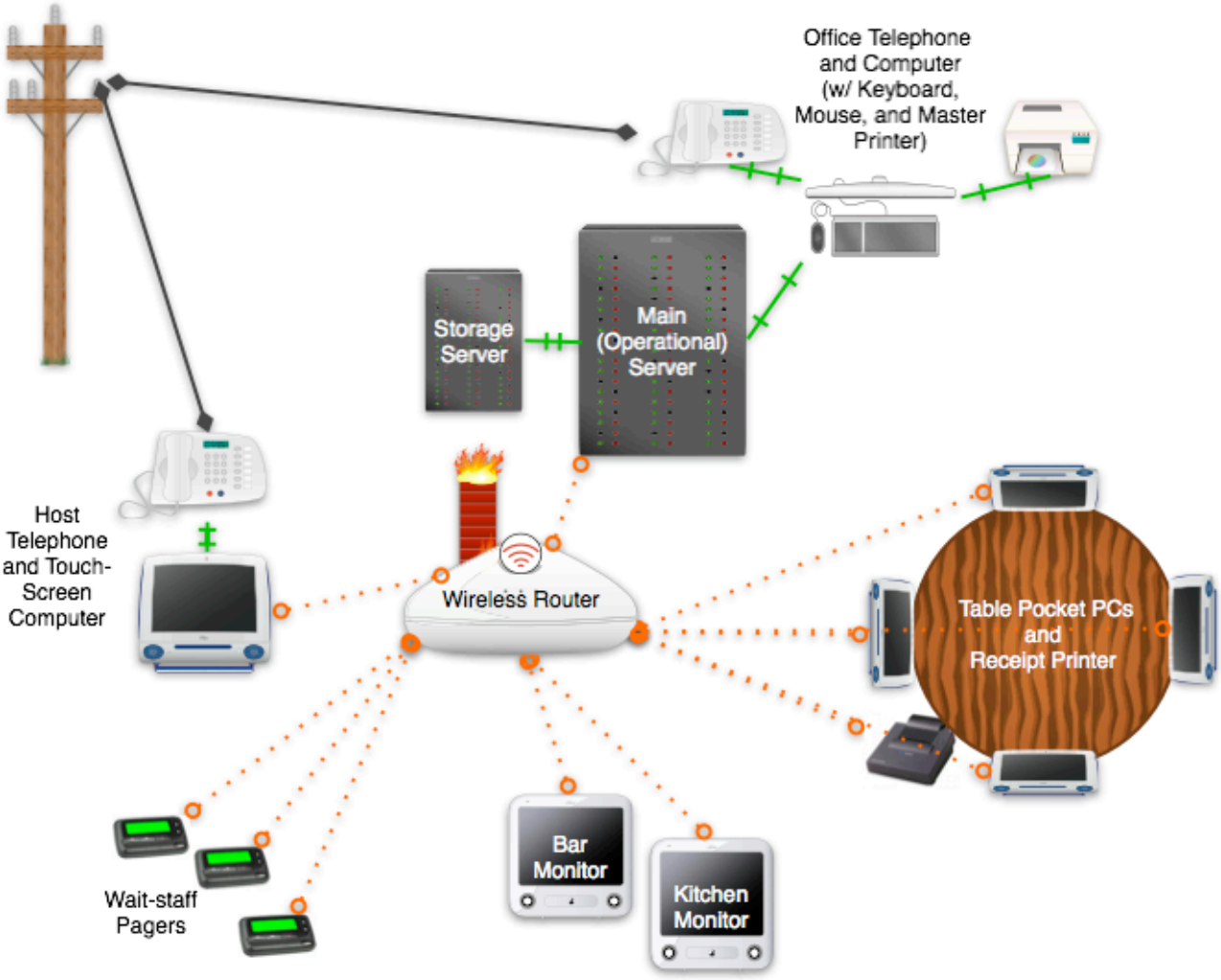
[12] http://www.bestbuy.com/site/olspage.jsp?skuId=5507043&st=Netgear+WGR+614&type=product&id=1051826245223

[13] http://jtech.com/products/serv_alert.htm

[14] http://www22.verizon.com/content/businessdsl/packages+and+prices/packages+and+prices.htm

[15] http://www22.verizon.com/Business/fyb/Voice/Voice+Lines+and+Systems/Business+Lines/

Network Diagram and Plan



The AWS utilizes a star-type network in each restaurant that it is implemented in. The green connection lines represent direct connections. The orange dotted lines represent a wireless connection. Black lines are connections through phone-lines. The center of the network is the main server, and it is connected to several clients. Some of these clients include pocket PCs, monitors, touch-screen monitors, pagers, telephones, and printers. Some of the clients are connected directly to the main server, however most others are connected wirelessly through a wireless router. Because of the nature of the network, clients are unable to communicate with each other, but instead communicate through the server.

Startup, Development and Ongoing Revenue Costs

Development Costs**:**
In this case, there are not any additional development costs. AWS does not require any more research and development in the areas of hardware and software. All of the hardware and software are already in existence.

Startup Costs**:**

Product	(units at price)	Total Price
Pocket PC……..	(200 at $300.00)	$60,000.00
Elo Touch 152 ……..	(1 at $1,499.00)	$1,499.00
ViewSonic Q171b …….....	(2 at $191.43)	$382.86
Epson TM-U220PD …….	(50 at $181.00)	$9050.00
HP Laser Jet 3050 ……	(1 at $299.99)	$299.99
HP ProLiant ML110 G3……	(2 at $634.99)	$1,269.98
FileMaker Pro 8.5……..	(1 at $299.99)	$299.99
Dimension C521……	(1 at $1,148.25)	$1,148.25
Future POS Software Package……..	(1 at $11,000)	$11,000.00
Netgear WGR 614…….……	(1 at $39.99)	$39.00
Wait staff Pagers……...	(6 at $149.00)	$894.00

Total Startup Cost: $85,883.07

The total startup cost of $85,883.07 will include all of the hardware and software required for the Automated Waiter System to operate. Everything from the individual units to the backup server is included in the price. Also included in the price is the installation of the software as well as employee training.

Ongoing Revenue Cost:

Product	(units at price)	Total Price
Internet Connection……...……..	(1 at $39.99/month)	$39.00
Phone Lines……	(2 at $35.00/month)	$70.00

Total Ongoing Cost: $109.00/month

The total ongoing cost of $109.00 per month includes connections for both the Internet and phone lines. Because training is given in the initial start up minor technical problems can be fixed by the restaurant staff.

Five Year Plan

Selling the complete Automated Waiter System (AWS) package will bring in a revenue of $85,883.07 from selling the entire system to a restaurant (software, hardware, etc). In addition,

our company will make additional revenue when restaurants using the AWS need to upgrade their software or their hardware equipment, which will not be on a frequently occurring basis. The profits made from selling the system will help to pay employee salaries, as well as fund the research and development of new hardware and software for the future.

Restaurants using AWS will see an immediate increase in their revenue as well as their profits. During the first year of implementation, a restaurant can expect to have cost for maintaining the system drop considerably. This drop can be attributed to the very small ongoing cost associated with the AWS of $109.00 per month. If the restaurant already has at least two phone lines as well as an internet connection set up, than the ongoing costs of implementing the AWS system will be no different than before a restaurant implements the system. Implementation of the system will also reduce the amount of orders that need to be sent back to the kitchen, saving approximately $50,000 a year. In addition, the system will save restaurants salary expense, as less wait staff will be required. During the first year, restaurants can expect on average to save approximately $123,000 a year in salary expense since waiters/waitresses will only be needed to assist customers with the system as well as bring change in the case that the customer is paying with cash. The system will attract a great customer base, as more people will want to come to the restaurant as a result of the increased ease of dining. This increase in customers will lead to a big increase in the profit of the restaurant as long as AWS is in place. After the third year of using the AWS, restaurants using the system can expect to see an increase in profit from the increase in customer volume, as well as the decrease in cost of $519,000. It is apparent that by the fifth year, AWS will continue to guarantee restaurants an increased customer base as well as a decrease in overall cost by $865,000. Our system is the perfect solution for any restaurant looking to increase efficiency, increase their customer base, as well as increase their profits.

How to Implement

The idea of changing the way a restaurant operates from its standard operations, where a waiter/ waitress caters to the needs of its customers, to the Automated Waiter System (AWS), where all facets of the meal are primarily automated, requires a large amount of dedication from the restaurant. There are four ways that a restaurant can choose to implement a new process: parallel conversion, pilot conversion, phased conversion, or direct conversion. There are advantages and disadvantages to each of the implementation methods.

If a restaurant would elect to do a parallel conversion where the old system and new system operate together, it would not work well for the restaurant. Waiters/ waitresses use computers to import the orders from the customers already, but AWS allows customers to directly import their orders. The advantage of this choice would allow a restaurant to determine which system is more profitable. The problem with this idea is that the two systems cannot operate at the same time. AWS would not be able perform all of its functions. Waiters and waitresses are included in AWS to complement it, but they are not meant to function at the same time, which parallel conversion would require.

If AWS was implemented as a pilot conversion, the system would be put into place in a small test part of the restaurant, and the restaurant would not benefit. It would be costly for the restaurant to buy the necessary products and set up the network connections for AWS to work

and then not use it. The advantage is that the restaurant would be able to see if AWS is an advantageous investment. If it were only in a small area, the restaurant would probably have more confusion and problems, especially in the kitchen. The kitchen would have to have monitors to reflect both the orders from waiters/ waitresses and AWS. The pilot conversion method would cause more confusion for the restaurant staff than just actually implementing AWS.

A phased conversion of AWS would not work because AWS cannot be divided into phases. Instead, AWS is a package where all the components function together. There is no way to divide the system because all the parts are dependent on each other. The devices at the tables are linked to the kitchen monitors, which are all linked on a network and to a server. This technique does not offer any advantages to AWS and restaurants. The only disadvantage is that AWS is not able to work with a phased conversion method. AWS has to be implemented in one package, not in separate entities.

The implementation of AWS that would benefit restaurants is a direct conversion. A direct conversion involves eliminating the old system and switching to the new system. By doing this, the restaurant will initially spend a large amount of money to pay for all of the hardware, software, and components that are needed to run the system.

Although this type of implementation is risky because the restaurant has to completely abandon its current ways for a new system, it is clearly the best option. In the long run, it will be beneficial for the company to change its system at once rather then to slowly integrate it. If the company would slowly integrate the systems, there would be confusion on how to and who should be performing certain tasks. There could also be technological problems because there would be conflicting software running at the same time.

The current system of waiters/ waitresses catering to a customer's every need will not be able to coexist with AWS. AWS is intended to reduce the dependency that a customer has on their waiter/ waitress. AWS and waiters/ waitresses cannot both take a customer's order. They are to coexist in the sense that the waiter/ waitress is supposed to offer assistance and supplement AWS in tasks that it cannot perform, such as delivering a selection, giving change for a cash payment, etc.

In the case of a restaurant and its implementing AWS, the best option for a restaurant is to directly convert their current system to AWS. It will produce the best results for the restaurant, the waiters/ waitresses, and the patrons.

How to Persuade Restaurants to Adopt AWS

AWS will be marketed towards sit-down restaurants, specifically chain restaurants. Once restaurants investigate the product, they will see that AWS is the best solution to the problems that they face every day from upset patrons because orders were wrong and their wait time was too long to less food going to waste.

It will be marketed to restaurant owners by demonstrating how it will greatly reduce the many common problems that plague them on a daily basis. Since customers place their own orders, this will reduce the risk of selections being incorrect which would decrease the amount of wasted food. That benefit alone would increase a restaurant's profits.

Restaurants will also need to hire less waiters/ waitresses because AWS will take the order of a customer. The waiters/ waitresses will only be needed to supplement AWS by bringing drinks, food, change for a check, etc. A customer will not be dependent on a waiter/ waitress. The restaurant could then reduce the number wait staff members since there will not be a great demand by the customers for a waiter/ waitress to perform every task. That in turn will allow restaurants to spend less money on wages, which would increase their profits. AWS will also increase customer satisfaction because customers will be able to control the pace of their meal and ensure that their food meets their standards since they are the ones who placed the order.

AWS will not require restaurants to totally overhaul their computer systems. Most likely restaurants will have most of the equipment that is need and will only need to purchase some items and set up the required network to run AWS.

Since restaurants will not have to completely change their computer system and will receive many advantages, mostly financial, if they switch to AWS, restaurants will be inclined to investigate the option. Restaurants will be encouraged to use AWS because of how it will benefit them financially and increase customer satisfaction. Since customers would be satisfied, they would be more inclined to return to the restaurant.

Contingency and Disaster Recovery Plan

AWS would not be capable of losing all of its data because the data would be backed up on a separate server that is not used for routine applications. It is only meant to store data. The data is backed up frequently to ensure that the data is never lost.

If at any point in time AWS's computers and servers were down, then the restaurant would go back to the traditional ways of operating, meaning having waiters and waitresses take orders and report them to the kitchen. There would always be enough staff working at the restaurant in order to handle any problems that could arise if there was a problem with AWS. The restaurant would always have menus in print as well as a staff that is trained as a waiters/waitresses, not just on being able to complement AWS. If AWS was not working properly or had a malfunction, the restaurant would be able to function as normal and would not lose its data because of the backup system.

Ethical Considerations and Issues

The only ethical consideration that could arise with AWS is the fact that customer's data and employee data are stored on the database for the restaurant. The data would be their name, address, phone number, preferences, method of payment, e-mail address etc. The data would be considered private, and the ethical consideration would be to keep that information private. The

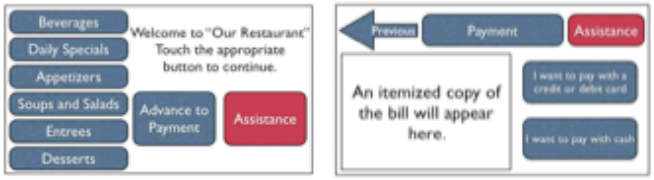
data would be kept private and only be accessible by authorized personnel. The database would be on a secure network computer and require a password to be accessed.

Members of the organization need to make sure that they keep the information within the database private. They need to make sure that they log off of the computer and do not distribute the password to unauthorized personnel. Patrons assume that their information will be confidential and only be used for business purposes. They place their trust within the organization to ensure the privacy of their information.

IV. Prototype

Executive Summary Slide

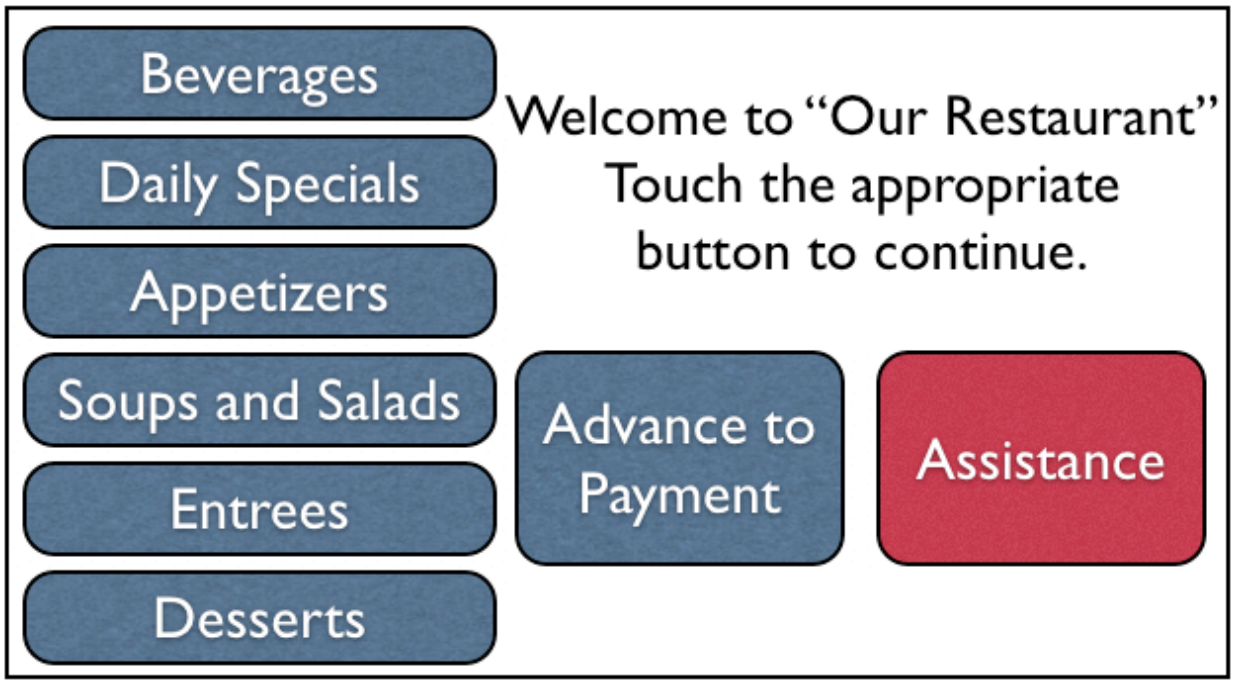
Project Title: Automated Waiter System (AWS)
Team Name: Team Restaurateur
Team Members: Eric Levy
Stefanie Grabosky
Nicole Mattar
Mike Rossetti



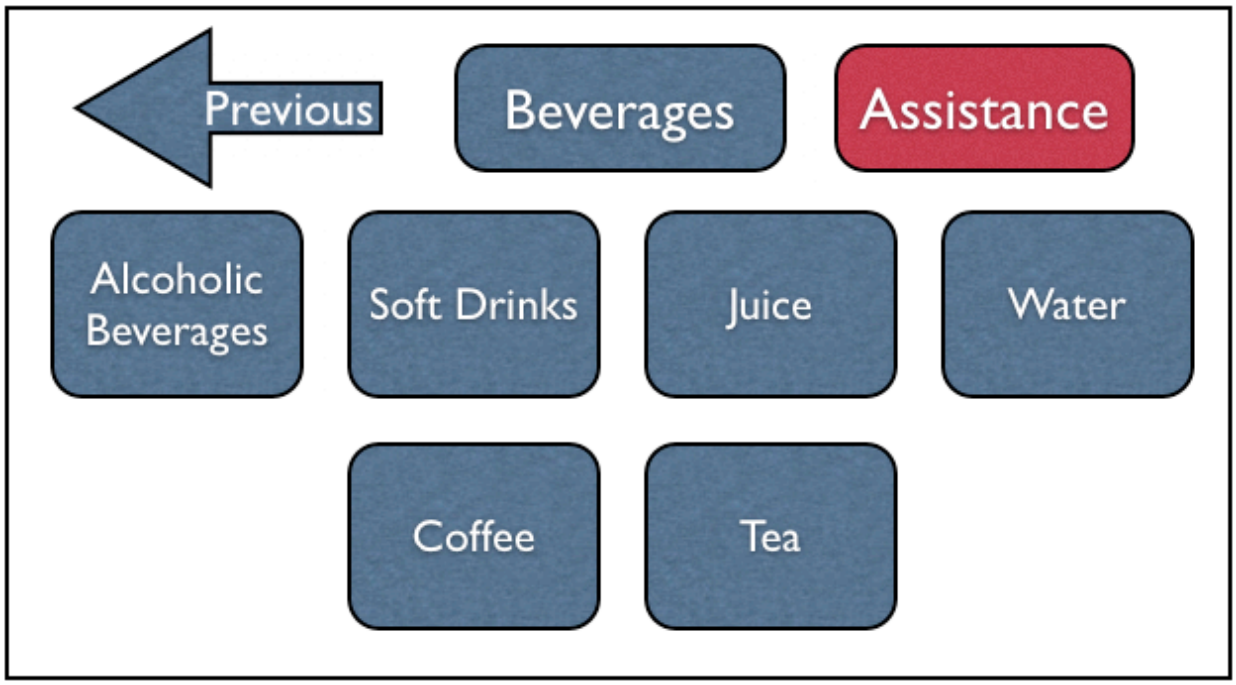
Problem: The restaurant process is inefficient which can lead to a poor customer satisfaction. Customers can be dissatisfied with the service, the quality of the food, as well as the overall dining experience.
Solution: In order to solve these problems, we propose to implement the use of the Automated Waiter System, a touch screen computer system that will simplify the dining process. It will allow customers to place their own orders, which will ensure that they order exactly what they wish.
Quantifiable Impact: The Automated Waiter System will help to reduce restaurant expenditures by approximately $123,000 which includes $73,000 a year in salary expenses as well as $50,000 in food expenses.

Below are some of the screen shots that would be used in the Automated Waiter System (AWS).

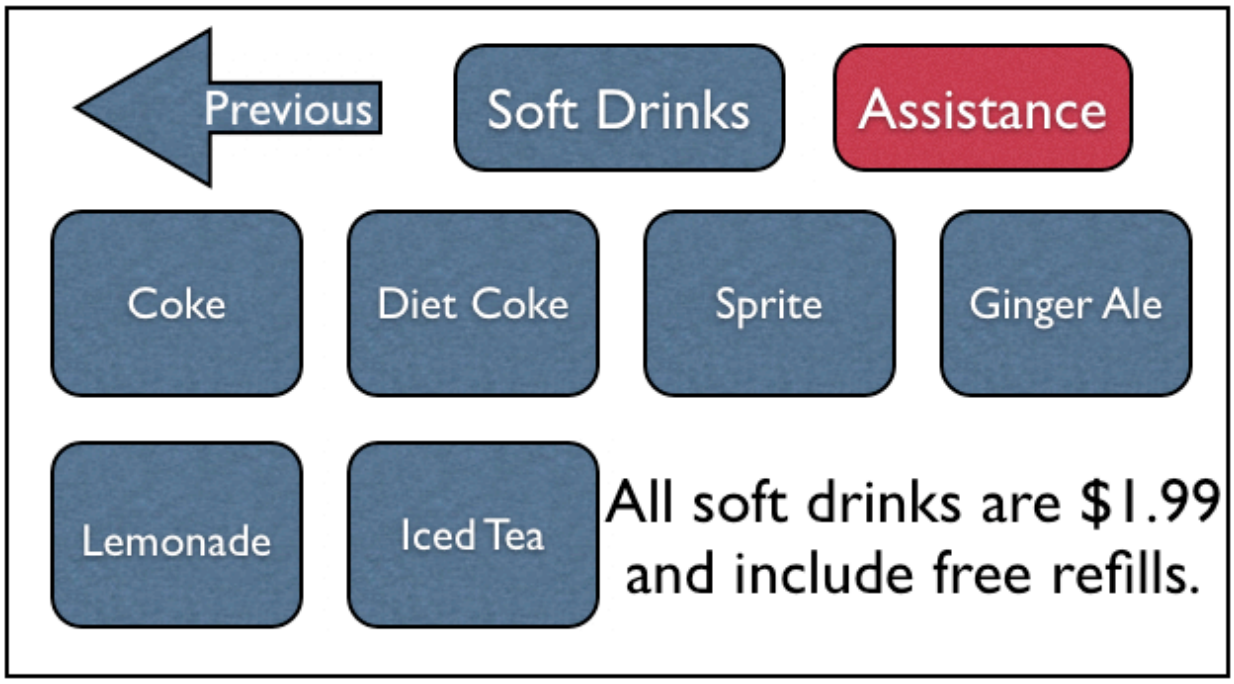
The Welcome Screen



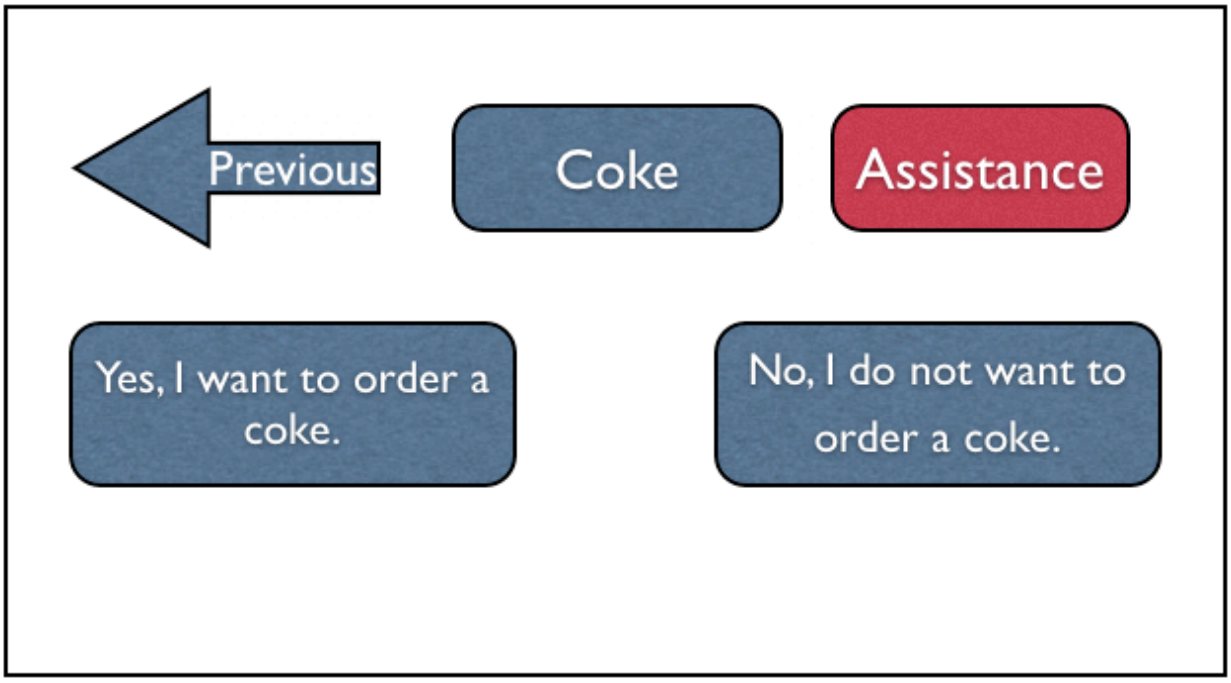
The Beverage Selection Screen



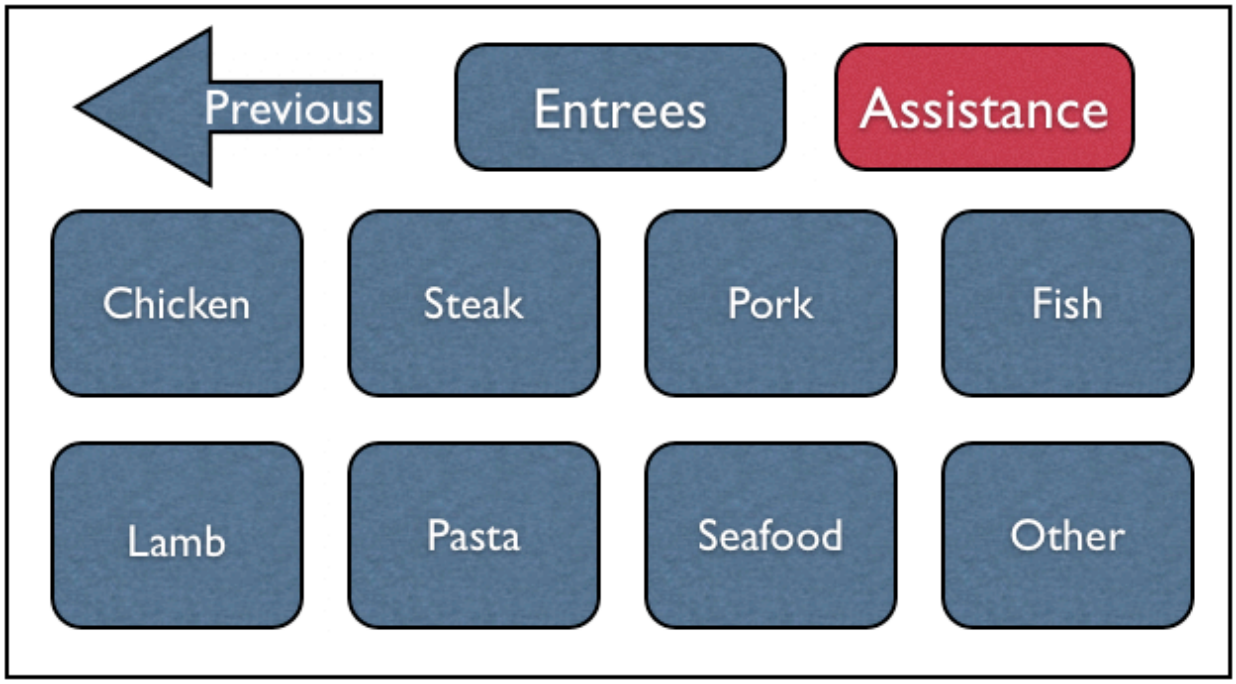
The Soft Drink Selection Screen



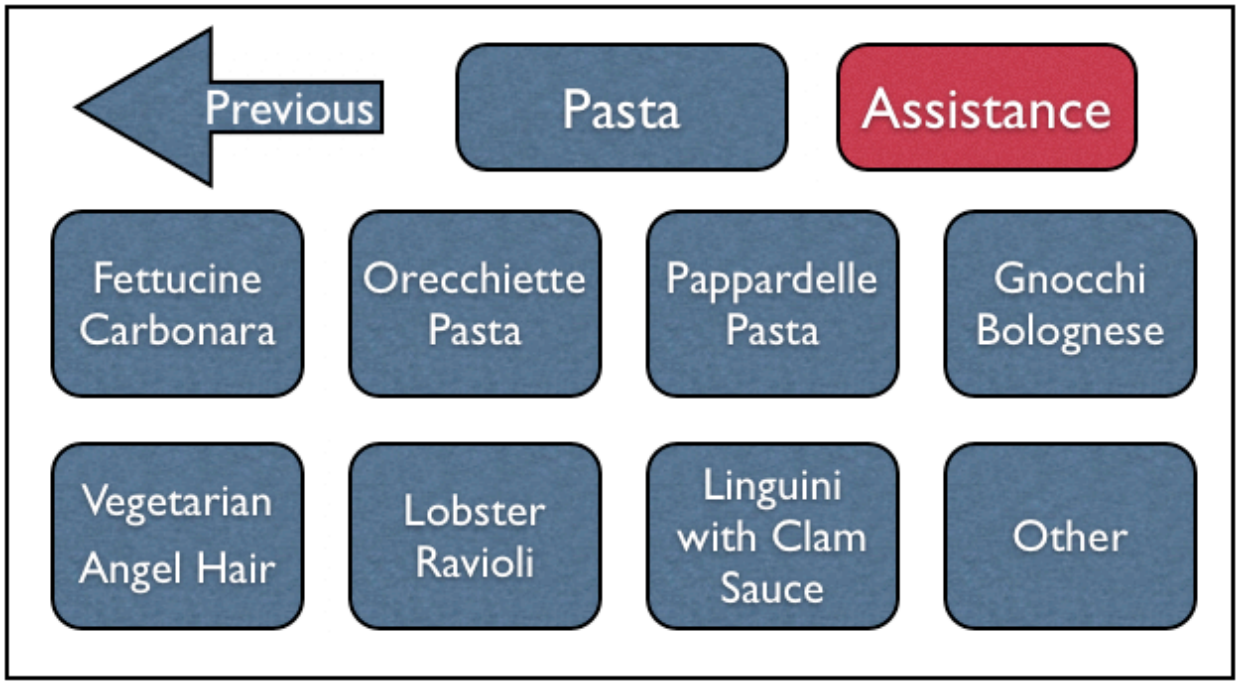
The Soft Drink Order Screen



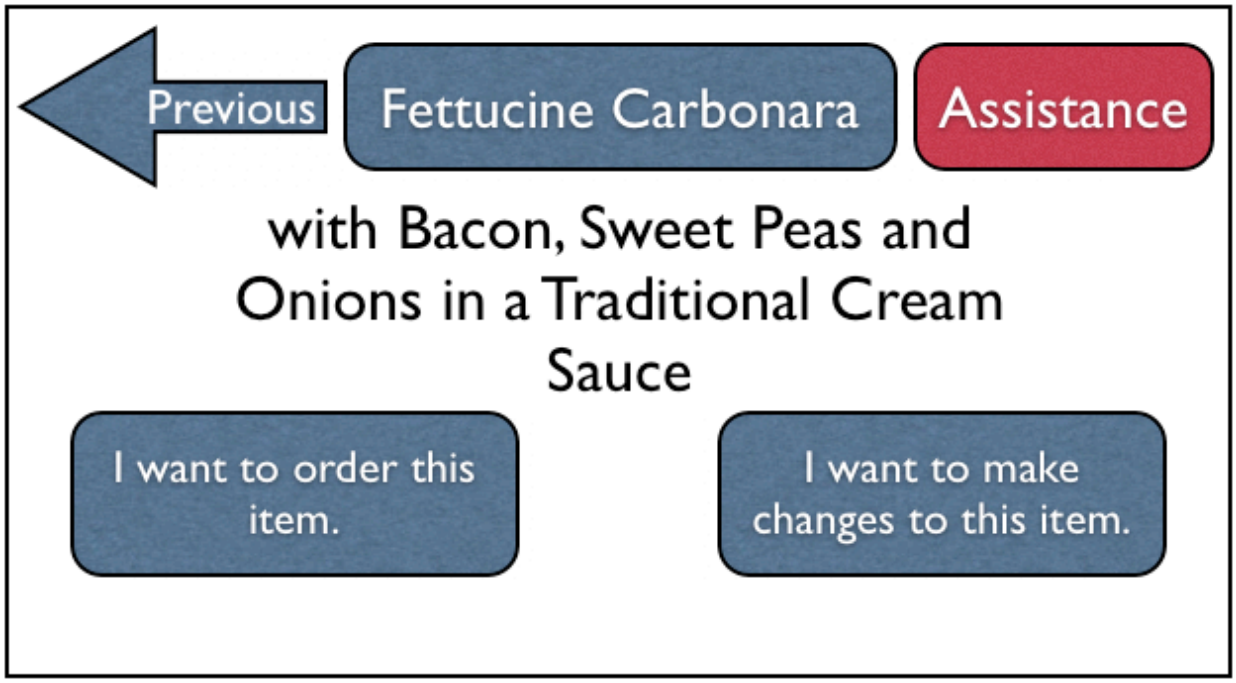
The Entrée Category Selection Screen



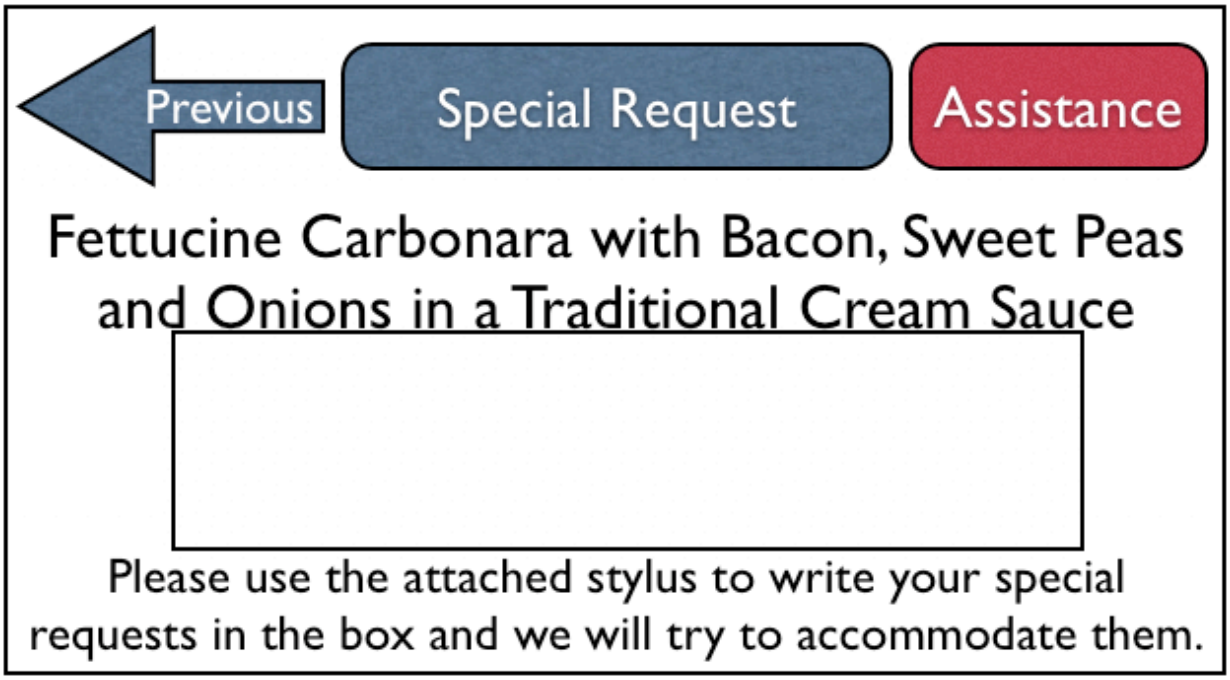
The Entrée Selection Screen



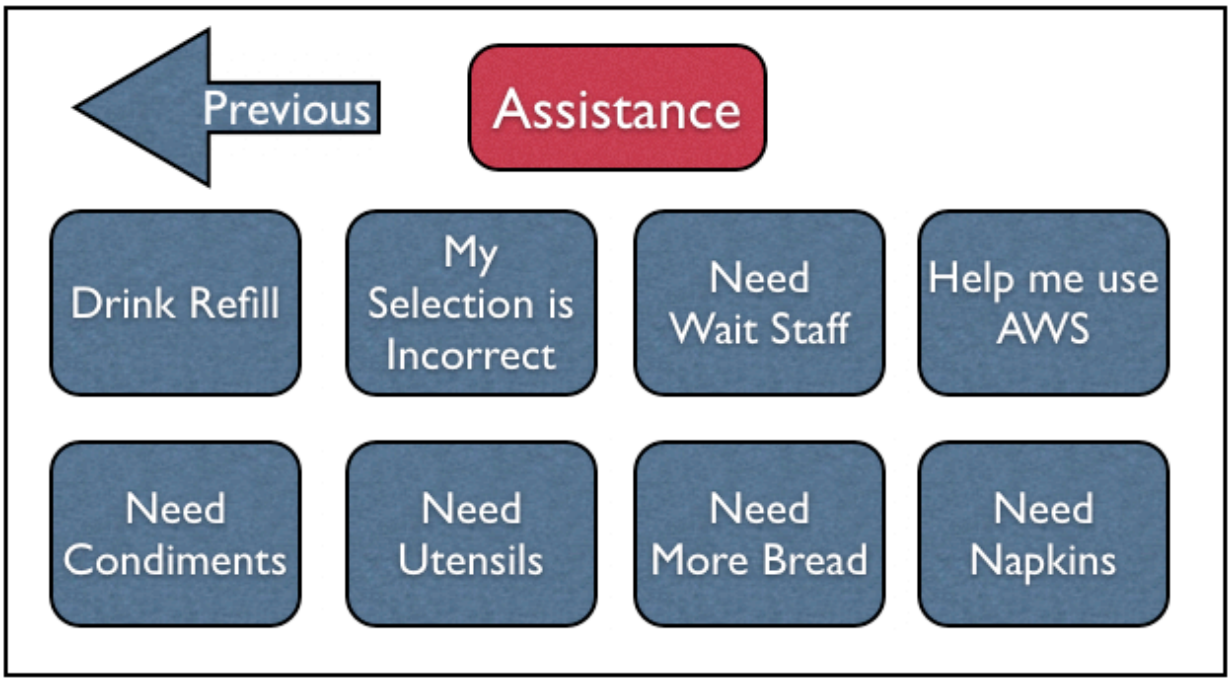
The Entrée Order Screen



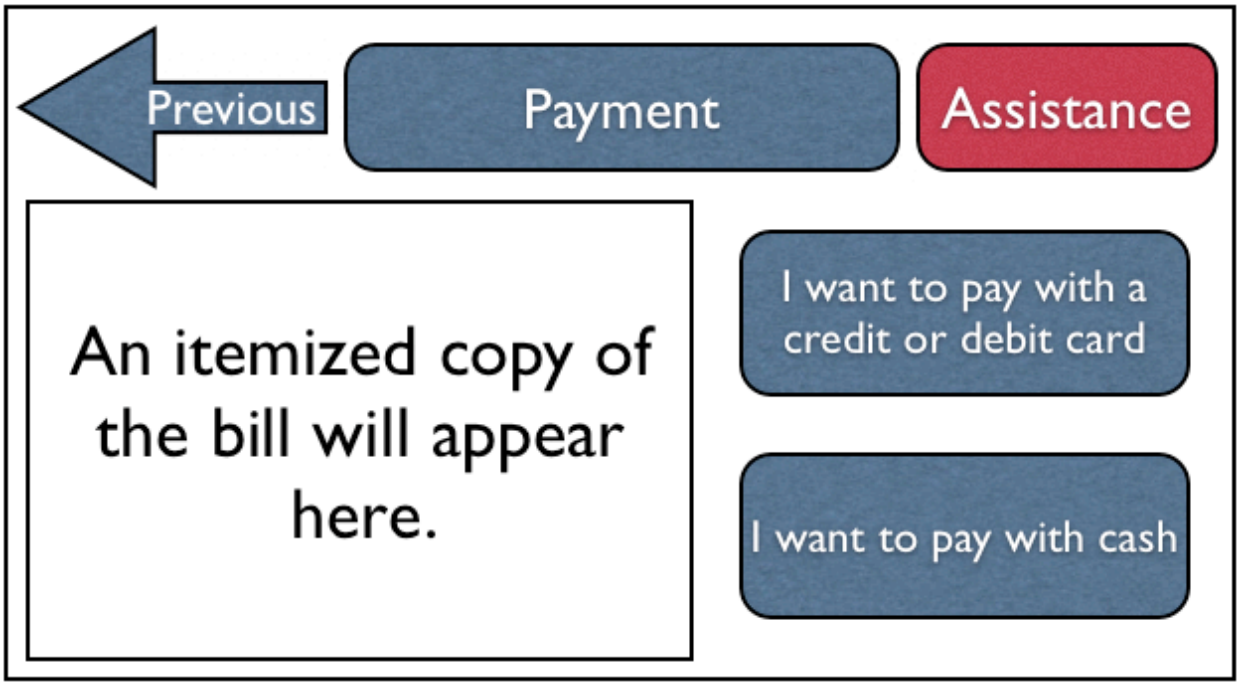
The Entrée Special Request Screen



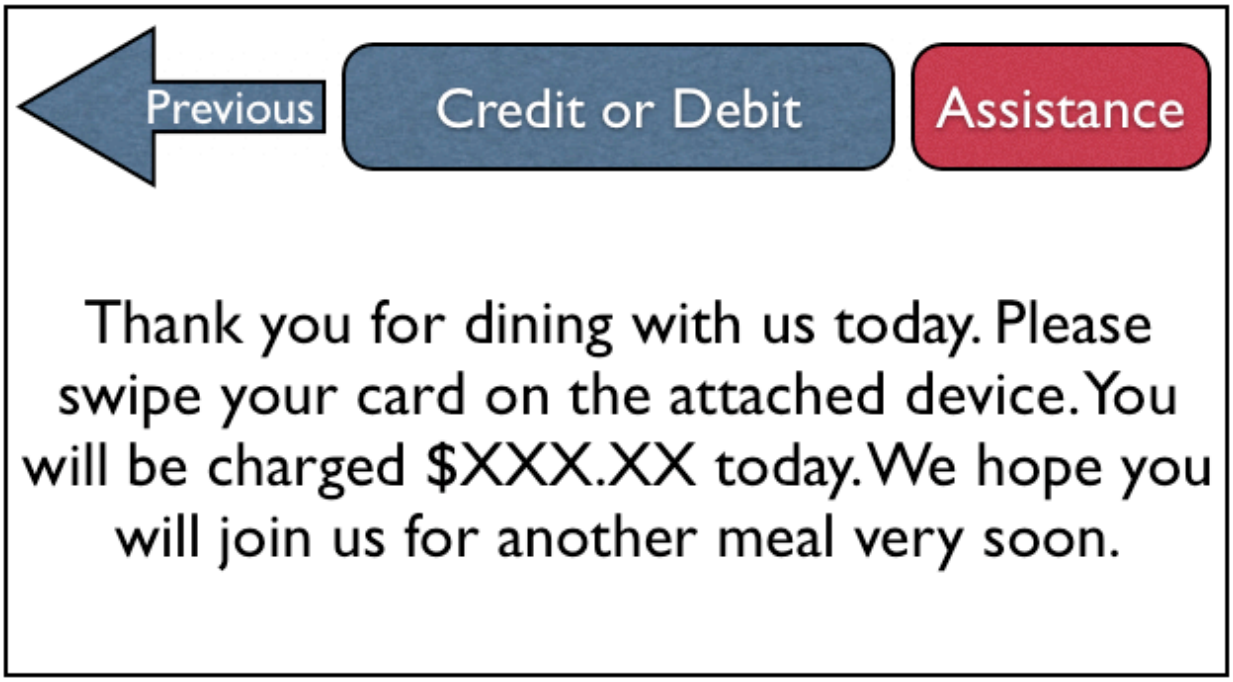
The Assistance Screen



The Payment Option Screen



The Credit or Debit Payment Screen



The Cash Payment Screen