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Kilkenny Irish Pub Ordering Kiosk

CPSC 481 - PORTFOLIO

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1. Introduction

1.1 Background Environment

Kilkenny's Irish pub has hired us to create an automatic ordering system for their customers to streamline the ordering and payment processes. Servers' jobs would become easier as they would face a reduced amount of responsibilities and customers would experience quicker service. The pub itself would find lower long-term costs as they would require less servers to cover the floor.

The system will be implemented by stand-alone kiosks at tables situated in the bar. This will allow customers to input food and beverage orders by themselves and on the fly.

Kilkenny's being a typical Irish pub gets very loud at times, especially when the bar is full and there is a game on. We are specifically targeting the system for the tables at the pub, and it is very rare for only a single person to be sitting at the table. Instead it is normally groups of two or more people. Most of the customers that go into Kilkenny's put all their orders on separate tabs so that they can pay separately. It is also very common for customers to place multiple orders in one sitting, in fact it is uncommon for a customer to only place a single order and very uncommon to be sitting alone at a table, they would sit at the bar instead. We also noticed that many people will ask the server to order a round of drinks, or place their order and then while she is taking another person's order change their own mind, cancelling their previous order, and placing a new one.

1.2 Uses for the System

This system will handle the ordering of food and drinks (beer, wine, spirits, soft drinks, and water) off the existing menu. It will also allow patrons to browse the menu, as you would in a traditional restaurant to make a better choice in terms of what the person wants to eat or drink. The system will also be used to page the server to deal with arising customer situations that are unforeseen. Finally, the system will be used to pay for the customer's order electronically (i.e. with a credit or debit card).

1.3 System Constraints

The system must be implemented on touch screen computers or tablets located at all tables in the pub. Tablets / computers will not be located at the bar as there is a bartender

behind the bar at all times. The system will need an internet connection to process card payments and a power source to keep the system up and running. The tablets will also need to be in some sort of waterproof case, to protect against spills and other potential damages.

The budget for this system is unknown, however we estimate that the system should be able to run on “cheaper” Windows 10 tablets to keep the costs down. Kilkenny’s has about 40 tables that would be equipped with the ordering kiosk system, which would include a tablet and a debit / credit card reader. There are multiple tablets that run Windows 10 with a retail price of around $300 dollars and then you would need to include the cost of additional debit and credit card readers which depends solely on the current deal Kilkenny has with their card reader provider. For now, we are estimating that implementing the system will cost around $20 000, however this could change later.

2. Users

2.1 Methodology

Tasks were collected through both an interview and observation process. Potential users were first identified and observed by first going to the Kilkenny's establishment. After watching several interactions between potential users and the server, we discerned that our

system should replicate the servers themselves. After initial observations, we conducted interviews to create six task examples and flush out the requirements for our system. We then created multiple evolutions of low-fi prototypes. For every iteration, we would execute walkthroughs of our user tasks to find potential problems and strengths for the next evolution. When we were content with an iteration of a low-fi prototype evolution we let a group of potential users navigate through the system for several different tasks. Using observation and questions we identified the strengths and weaknesses of our prototype for our final low-fi prototype.

2.2 Types of Users

Our system will be targeted towards young professionals and students ranging from 18 to 30 years of age. The typical user will be used to navigating touch screen devices, as every single person we observed owns and uses some version of a smart phone every day. This group of typical users are generally interested by technology and have a strong inclination towards control and information over their purchases. The typical user is also a frequent consumer of both alcohol and food.

The occasional user does not necessarily fall in the age range specified above (18 – 30). They would still have experience navigating a touch screen device, but would not necessarily have an interest in new technology. The occasional user only occasionally consumes alcohol but would still order food.

An unusual user is outside of the age range of our target demographic, does not consume alcohol but does order food. The unusual user may not have a grasp of how to navigate a touch screen device.

User Types		
Typical	Occasional	Unusual
• 18 - 30 • experienced with touch screen devices • interest in technology	• 18 – 60 • experienced with touch screen devices • occasionally consumes alcohol	• outside of 18 - 30 • un-experienced with touch screen devices • does not consume alcohol

• strong inclination towards control over purchases • frequently consumes alcohol & food		

2.3 Work Context

People like the ability to order food and drinks as soon as they want something as well as having direct and instantaneous information about the things they order. This creates the need for an at your fingertips, easy to use, self-directed ordering kiosk. The ordering kiosk will be placed at tables situated around The Kilkenny Irish Pub. The idea is to change the current way of ordering drink and food to a faster, easier, modern day system.

3. Tasks

3.1 Task 1: Greg

Greg is an intern for The City of Calgary. It is Friday afternoon, and after a long week, Greg just wants to sit down and have a pint of beer to unwind. Greg doesn't want to go drink alone so he calls up his friend, Julio, who agrees to go out with him and they decide on Kilkenny Irish Pub as their destination. Greg and Julio walk into the pub and sit down at a booth. They each want their own tab to be able to pay for their drinks separately. Greg isn't an avid drinker so he doesn't know what kind of beer he wants to drink, so he will want to browse the menu before ordering. He decides on a Gas Lamp Rustic Red. Julio knows that he wants a Rickard's Red, so he navigates himself to the domestic beers tab and places his order. Once Greg finishes his beer, the two friends will pay for their respective drinks and leave.

3.2 Task 2: Mary

Mary and Jim are university students that really enjoy wings and they want to try Kilkenny's famous wings. They go to the pub, sit down at a table, and look through the wing menu. Since tonight is Monday, wings are on special. After a few minutes of browsing, they choose their flavours: mild and hot, and place the order. A couple of minutes later the wings and pop arrive. They enjoy their meal, pay by card and leave the pub.

3.3 Task 3: Shannon

Shannon just finished her night class at the University of Calgary. She has plans to meet up with a group of friends at The Kilkenny Irish Pub. Since she is going directly from school to the bar she arrives first. Shannon wants to be on a separate tab from everybody else so that she only has to pay for her own items. When she opens the menu, she sees that Caesars are on sale in the specials menu and decides she wants one. While waiting for the server she browses through the drinks, and sees rye and ginger on the menu which prompts her to change her mind about what she wants. The server comes by and Shannon orders herself the rye and ginger cocktail. While waiting for her drink, her friends Casey and Dennis arrive. Casey and Dennis will want to share a tab between the two. Casey and Dennis then order their own drinks and the three hang out while they wait for the rest of the group.

3.4 Task 4: Victor

Victor is in his first year at the University of Calgary. He meets up with his coworkers at The Kilkenny Irish Pub as soon as he gets off work at Foothills Aquatic Centre. His coworkers, Nick and James, are already there by the time he arrives and have each have a beer in front of them. Victor wants a pint of Maple Cream to quench his thirst and wants to check what food to get, since he is hungry after finishing work. He wants to check the specials before browsing the full menu so that he can potentially save some money. He settles on the Stuffed Mac and Cheese Bites and orders them under his tab. Once everybody is done at the table, Nick and James opt to pay with card while Victor pays with cash, so he calls over the server so that the payment can be processed. He hands the server $20 and tells her he doesn't require any change back.

3.5 Task 5: Jacob & Jamie

Jacob and Jamie are going to Kilkenny for a date night. When they sit at the table the first thing they look at are the features. They see that the steak sandwich and wine are on special tonight. They both agree that the steak sandwich looks good, and both happen to pick the same glass of wine. When their server comes by, they both order the same thing. After eating and drinking a couple glasses of wine each, Jacob picks up the bill.

4. Tentative List of Requirements

4.1 Absolutely Must Include

Ability to order beer, wine, spirits, soft drinks or water via the interface.

- We want users to be able to order a variety of alcoholic or non-alcoholic beverages. The user will can choose between ordering a discounted beverage via the Specials menu or browse through a complete list of available items via the Drinks menu. Both are easily accessible at any time via the Navigation Menu located at the bottom of the interface.

Ability to order any food item off the existing Kilkenny Irish Pub menu.

- The goal of the app is to provide Kilkenny's patrons with a method of ordering without the need to wait for a server, and food items are just as important to have as the drinks. A Food icon is also supplied on the Navigation Menu and all food on special for that day will also be available in the Specials menu.

Individual tabs for multiple patrons sitting at one table.

- After interviewing several typical users, there was an overwhelming interest shown to incorporate "tabs" in our interface. Users claimed they wanted a convenient way to separate the items they ordered from the items of the other people at the table. A numbered system was pitched but was not well received as users claimed they would likely forget which number belonged to their tab, and a name system was decided on, where each user inputs their name upon creating a tab for themselves.

Order queue to allow users to order multiple drinks at a time.

- Users will be able to order multiple types of drink/food items before sending the order to the bar/kitchen. This will grant the users the opportunity to change their mind and edit their order without any penalty to them or the bar itself. Once the user is certain about their choices they can send the order off to be fulfilled. At this point the items that were sent to the queue are charged to the user’s tab.

4.2 Should Include

Ability to customize (food) order.

- We want the interface to be able to deal with dietary restrictions, picky eaters and allergies so a comment box of sorts will be part of the ordering overlay when food items are chosen so that people may request a customized order to suit their needs. For example, a user may request “no tomatoes” to receive a Pub Burger without tomatoes.

Call the server to the table for additional assistance.

- If a user receives an incorrect order or desires to pay for their tab in cash, the server would be able to walk over to the table to either return the food item or receive the payment and provide the patron with change (if necessary). Additional assistance that could be provided would include but not be limited to applying discounts for Gold and Platinum VIP members, senior discounts, or club discounts.

4.3 Could Include

Electronic/ card payment.

- If the user desires to pay with a credit or debit card, the interface would be able to send the total to the attached debit/credit card reader for the user to pay for their tab without needing to wait for a server.

Provide nutritional facts for food items.

- For users/ patrons that are concerned for their health but still want to go out to a pub, the nutritional facts could be displayed during the ordering overlay. This approach however would take up a lot of screen space and would not lend itself to a crisp user experience.

4.4 Exclude

Cash Payment.

- To allow the user to pay with cash via the interface, this would require a cash/change dispenser to be attached to the tablet, which is outside the scope of our project. Instead, a server can be called to the table to handle that process.

Accessibility for visually impaired.

- Due to the scope of our project, the interface will not provide screen reading or any additional aids for visually impaired patrons.

Multi-lingual support.

- The interface will be available only in English, but any resident of Canada should have no problems using the system, even with a limited grasp of the language as most features are accompanied with a visual component (i.e. Thumbnails).

5. Prototypes

5.1 Methodology & Evolution of Prototyping

To develop our prototypes, we decided to come up with at least 3 different designs (see Appendix 7.1, 7.2 and 7.3), analyze and use them to decide our most evolved prototype. This way we were trying to eliminate the possibly that we would be stuck imitating all our previous designs which would lead to very little difference between the iterations.

To come up with our first three prototypes we used the requirements outlined above to determine which features needed to exist and then tried different ways to focus on and include those requirements. Some of our initial designs were strongly influenced by the McDonald's self-ordering kiosk, which some of our group members really enjoy using. We thought that we could take what we like about their designs and try to incorporate it into our own. However, after playing around with it for a bit we found that it didn't lend itself to our situations as we needed multiple people to be able to order on the same kiosk multiple times before paying separately, and our system needed a much larger emphasis on specials.

We decided on our third prototype to be the basis for our most evolved prototype, as we found it fit best with the criteria we had. This was the prototype we presented in tutorial. We used the feedback given to us by Kevin, especially regarding the confusion of adding an item to the order queue, as we continued to evolve the prototype. We also continued to reference our users and the detailed walkthrough we performed as we made incremental changes. In the end our most evolved prototype takes the best features from all three of our original designs, as well as the feedback we received from the walkthrough, the users and Kevin.

5.2 Most Evolved Prototype

Once a user sits at a booth or table, they will see the splash screen that greets them by default (Appendix 7.5.1) that contains a welcome message as well "Please add a tab to get started" located at the bottom to aid the user in getting started.

By tapping on "New Tab +" the user will be prompted to provide their name. They will have the option to submit the name, which would switch them to the Specials tab, or cancel, which will return them to the splash screen. The names are necessary in order to separate tabs

between groups of people sitting at the same table using one tablet. The tabs help to ensure the bar patrons should only pay for items they ordered.

On the Specials tab (Appendix 7.5.2), the user will see a list of items that would be cheaper that night. All the drinks on sale would be displayed first, followed by the food items. Each item displayed has the name of the product on the top left, the price on the bottom right and a thumbnail to show the user a quick preview of what that item should look like. The tab navigation menu on the left side of the screen holds all tabs that are currently open, the Kilkenny Irish Pub logo at the top as well as a "+" button to allow the addition of any other tabs later, in case somebody shows up to the table late. It is located on the left to allow users to easily switch tabs without needing to maneuver any additional screens. Most bar visits have multiple people ordering multiple items multiple times throughout the night, our interface needed to be able to switch between these in a way that wasn't tedious for the user, thus we decided on the tab navigation on the left side.

On the bottom, we have the 4 main navigation tabs, Specials, Drinks, Food, Call. These tabs are permanently located in that position to allow the user to quickly navigate between core sections of the menu as well as be able to easily call a server if necessary. Specials are first since many users claimed the first thing they do is ask their servers about the specials for the night, so we provide the users with that information immediately. Drinks is second since the typical user visits the bar to consume alcohol, and since people read left to right, it makes sense to have this be the first tab they can navigate to. Food is third and Call is last because we don't want users to feel the need to call a server over constantly. We wish to deter from the need of having a server at the table since the whole point of the interface is to provide a quicker ordering experience, but we recognize that there are some situations that require a server to be present, like when a patron wants to send food back to the kitchen or pay with cash.

The bottom right of the screen has name of the person whose tab is currently open as well as that person's total. Tapping on this area will bring the user to the payment screen where they can pay for their food and drinks.

The Drinks and Food tabs are very similar to the Specials tab, the difference being that Specials displays both food and drink items while the other tabs display only one or the

other. Upon opening the Drinks tab (Appendix 7.5.3), the user will be greeted with the 4 categories of drinks: beer, cocktails, pop and water. The area underneath these buttons is automatically populated with the Gas Lamps. This avoids wasting space and populates it with one of the most common drink options among recurring patrons. Tapping on any of the 4 buttons changes what drinks appear in that bottom area, like tapping the Beer thumbnail will load in all the types of beers (Appendix 7.5.4), tapping the cocktails button it will load in the various cocktails offered.

If a user taps on the thumbnail for a specific drink, it will open an overlay (Appendix 7.5.5) with the drink name, thumbnail and description. This overlay will also allow users to order multiples of the same drink via the quantity increase/decrease buttons. The top right has an "x" button to allow users to opt out of ordering that drink before adding it to the tray. The final button on the overlay is the "Add to Tray" button which is how the user adds items to their order without sending yet sending it to the kitchen/bar. There is also a "?" button next to the text of that button that will explain what adding an item to the tray means/does, just as a precaution. If the user wants to order multiple types of beers, they can do so without needing to send each drink request to the bar independently. This prevents the kitchen/bar from being overwhelmed with orders constantly printing at their station.

Once an item has been added to the tray, they appear in the order queue which is located right on top of the user's total. This shows the users the items that they would be ordering once they hit the "Submit" button as well as the price of each item and the total cost of the items about to be ordered. This menu is minimized after a couple seconds but can be brought up again by pressing the up arrow located at the top of the order queue (Appendix 7.5.5). The existence of the order queue allows users to double check their order or change their order before being charged for it.

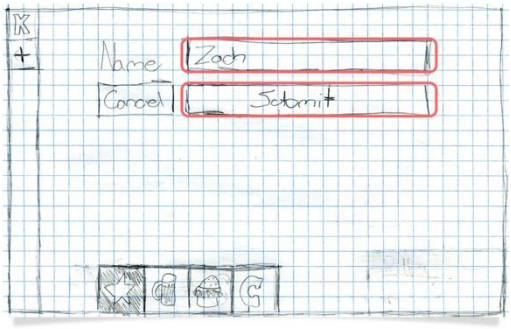
If at any point a user taps on the bottom right corner where the total is displayed, they are directed to the Payment tab (Appendix 7.5.6) which displays all the items the user ordered on their tab as well as the total including applicable taxes. The two buttons at the bottom are the payment options for the user; if they choose cash it will call the server, and if they choose credit/debit it will begin the payment process on the debit machine that is attached to the tablet.

5.3 Story Board

Splash Screen

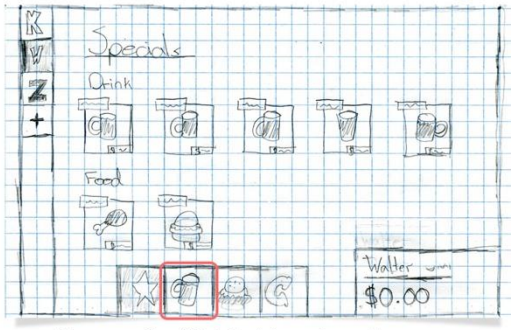
Adds a new tab for himself.

Tab Creation



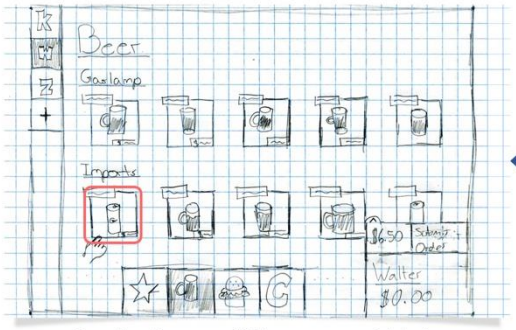
Types in name and taps "Submit".

Navigate to Drinks



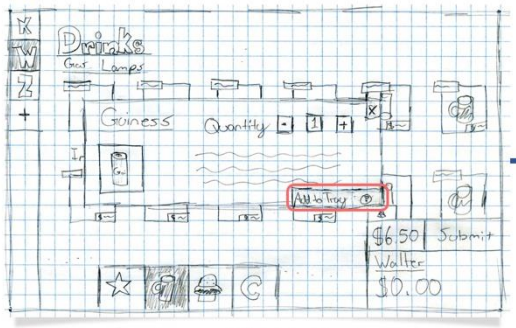
Taps on the "Drinks" icon in main menu.

Select Drink



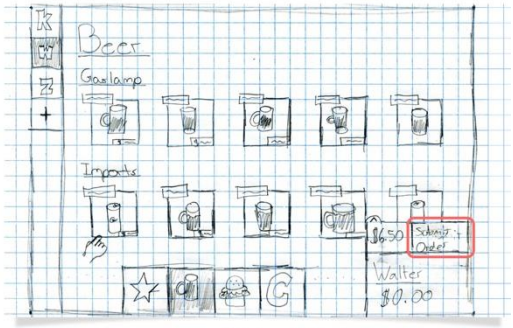
Scrolls down until the proper drink is displayed. Taps on the drink icon.

Add Drink to Order Queue



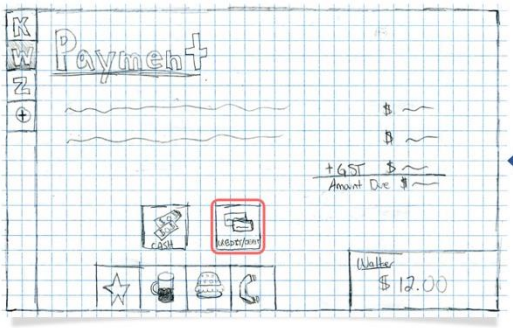
Taps on "Add to Tray".

Order Drink



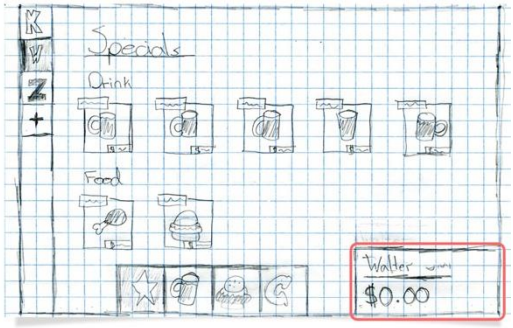
Taps on "Submit Order".

Pay Tab



Taps on "debt/credit" icon

View Tab



Tap on the "Tab" in the bottom right.

6. Walkthrough and Discussions

6.1 Walkthrough

6.1.1 Task 1: Greg Walkthrough

Step No.	*Step Description*	*Knowledgeable?*	*Motivated?*	*Comments / Solutions*
1	Greg clicks add tab	Yes, he knows how to use a touchscreen.	Yes, he only wants to pay for the items he orders.	Greg is fairly young and has experience using a touchscreen before so he knows how to click a button on a touch screen kiosk.
2	Greg enters his name and clicks submit	Yes, he knows how to use a touchscreen keyboard and click a button.	Greg does not want to confuse his and Julio's tab.	Greg knows how to use a touchscreen thus he knows how to enter his name. This will take a few seconds but it will save them from confusion later when they go to pay.
3	The special screen automatically opens and Greg browses through it.	Yes, he knows how to scroll a touchscreen.	Yes, he does not know what he wants to drink yet.	The screen automatically opens so Greg just needs to scroll through it. Images make it easy to see what the different items are.
4	Greg clicks on the Gas Lamp Rustic Red icon	Yes	Yes, he wants a beer.	Greg has a touchscreen phone and has used McDonald's touch screen menu before so he knows how to click an icon.
5	Greg clicks the little question mark icon.	Yes	Yes, he is unsure what the order tray is.	He knows that the question mark will bring up a help screen to explain the tray as that is the standard.
6	Greg closes the help menu.	Yes	Yes, he now understands the tray.	Closing a help box just means clicking the x.
7	Greg clicks add to tray.	Yes	Yes, he wants to order his beer.	Having read the help screen Greg knows what the tray is and how to use it.
8	Greg clicks submit order.	Yes, he read the help screen.	Yes, he only wants the one beer for now.	The user needs more feedback after submitting an order. We will implement some sort of alert system so the user knows whether or not their

				order has actually been placed.
9	Julio clicks add tab and enters his name.	Yes	Yes, he also only wants to pay for his order and wants to know which is his.	Having used modern touchscreen devices before, navigating the system is intuitive.
10	Julio clicks the drink icon.	Yes	Yes	No new issues
11	Julio scrolls to Rickards Red.	Yes	Yes	He may want a faster way to get to Rickard's as he knows this is the beer he wants.
12	Julio clicks Rickards Red.	Yes	Yes	No new issues
13	Julio clicks add to tray.	Yes	Yes	No new issues
14	Clicks submit order.	Yes	Yes	The user needs more feedback after submitting an order. We will implement some sort of alert system so the user knows whether or not their order has actually been placed.
15	Julio clicks his total to go to payment screen.	Mostly	Yes	It may be confusing or unclear that you click your total to go to payment screen.
16	Julio clicks pay with card and taps his card on reader.	Yes	Yes	Having used self-checkout kiosks at grocery stores this is intuitive.
17	Greg clicks on his name in the tab panel.	Yes	Yes	Since the side panel is located on the side and always visible, switching tabs is fast and convient.
18	Greg clicks his total	Mostly	Yes	Might be unclear that you click your total to go to payment screen.
19	Greg clicks pay with card. Proceeds to pay with card.	Yes	Yes	No new issues

6.1.2 Task 2: Mary Walkthrough

Step No.	*Step Description*	*Knowledgeable?*	*Motivated?*	*Comments / Solutions*
1	Mary clicks add tab	Yes, she knows how to use a touchscreen.	Yes, she only wants to pay for the items she orders.	The ability for users to have separate tabs is very important in a bar setting. Splitting bills between big groups (which is very common in this setting) can be a big concern.
2	Mary enters her name and clicks submit	Yes, she knows how to use a touchscreen keyboard and click a button.	Mary does not want to confuse her tab and Jim's tab.	Mary knows how to use a touchscreen thus she knows how to enter her name. This will take a few seconds but it will save them from confusion later when they go to pay.
3	The special screen automatically opens and she browses through it.	Yes, she knows how to scroll a touchscreen.	Yes, she does not know what she wants to drink yet.	The screen automatically opens so Mary just needs to scroll through it. Images make it easy to see what the different items are.
4	Mary clicks on the wings icon.	Yes	Yes, she wants to order wings.	It is intuitive.
5	Mary selects hot as a flavour.	Yes	Yes	It will pop up in the box that allows users to add to tray.
6	Mary clicks add to tray.	Mostly	Yes, she wants wings.	The tray might be a bit confusing, but there is a help button beside it.
7	Mary clicks submit order.	Yes	Yes	The user needs more feedback after submitting an order. We will implement some sort of alert system so the user knows whether or not their order has actually been placed.
8	Jim repeats steps 1 – 7 for himself (ordering mild).	Yes	Yes	No new issues.
9	Mary switches to her tab.	Yes	Yes	It is intuitive that clicking in the left tab list switches the active user.

10	She clicks on her total.	Mostly	Yes	May not be obvious that you can click on the total.
11	Clicks pay with card and pays.	Yes	Yes	She has used self-checkout before so it is intuitive.
12	Jim repeats steps 9 -11	Yes	Yes	See above.

6..1.3 Task 3: Shannon Walkthrough

Step No.	*Step Description*	*Knowledgeable?*	*Motivated?*	*Comments / Solutions*
1	Shannon clicks add tab	Yes she knows how to use a touchscreen.	Yes she only wants to pay for the items se orders.	No new issues
2	Shannon enters her name and clicks submit	Yes she knows how to use a touchscreen keyboard and click a button.	Shannon does not want to confuse her tab and Jim's tab.	Shannon knows how to use a touchscreen thus she knows how to enter her name. This will take a few seconds but it will save them from confusion later when they go to pay.
3	The special screen automatically opens and she browses through it.	Yes she knows how to scroll a touchscreen.	Yes she does not know what she wants to drink yet.	The screen automatically opens so Shannon just needs to scroll through it. Images make it easy to see what the different items are.
4	Shannon clicks on the Caesars icon.	Yes	Yes she feels like a Caesar.	This is intuitive.
5	Shannon clicks add to tray.	Mostly	Yes she wants a Caesar.	The tray might be a bit confusing, but there is a help button beside it.
6	Shannon clicks drinks then the spirits / cocktails tab.	Yes	Yes	The user needs more feedback after submitting an order. We will implement some sort of alert system so the user knows whether or not their order has actually been placed.
9	Shannon clicks Rye and Ginger.	Yes	Yes	No new issues.
10	Shannon clicks add to tray.	Mostly	Yes	The tray might be a bit confusing, but there is a help button beside it.

11	Shannon clicks expand tray button.	Yes	Yes	It is intuitive.
12	Shannon clicks remove item for Caesar.	Mostly	Yes she no longer wants the Caesar.	It might not be clear how you remove items. Users might accidentally remove items they wanted to keep.
13	Shannon clicks submit order.	Yes	Yes	No new issues.
14	Casey clicks new tab and creates a tab for her and Dennis.	Yes	Yes they want share the tab.	No new issues.
15	They order drinks (repeat of steps 3 – 13)	Yes	Yes	Same as outlined above.
16	Shannon changes to her tab	Yes	Yes	No new issues.
17	Shannon clicks her total	Mostly	Yes she wants to pay and go home.	Might not be obvious that you need to click total.
18	Clicks pay with card and proceeds to pay with card.	Yes	Yes	No new issues.

6.1.4 Task 4: Victor Walkthrough

Step No.	*Step Description*	*Knowledgeable?*	*Motivated?*	*Comments / Solutions*
1	Victor clicks add tab	Yes, he knows how to use a touchscreen.	Yes, he only wants to pay for the items he orders.	Victor is a university student and has experience using a touchscreen before so he knows how to click a button on a touch screen kiosk.
2	Victor enters his name and clicks submit	Yes, he knows how to use a touchscreen keyboard and click a button.	Greg does not want to confuse his and Julio's tab.	Victor knows how to use a touchscreen thus he knows how to enter his name. This will take a few seconds but it will save him and his friends from confusion later when they go to pay.
3	The special screen automatically opens and Victor	Yes, he knows how to scroll a touchscreen.	Yes, he wants to potentially save some money on his tab.	The screen automatically opens so Victor just needs to scroll through it. Images

	browses through it.			make it easy to see what the different items are.
4	Victor clicks on the Maple Cream Gas Lamp	Yes	Yes, he wants a beer.	No issues
7	Victor clicks add to tray.	Yes	Yes, he wants to order his beer.	Victor would see the submit button that appears but not tap it, since he also wants food.
8	Victor navigates to the food menu after being dissatisfied with the food specials	Yes	Yes, he wants to browse other food options	No new issues.
9	Victor taps on Mac and Cheese Bites thumbnail	Yes	Yes, he wants to stop being hungry.	No new issues.
10	Victory adds the food to his tray	Yes	Yes	Victor has selected everything he wants now.
11	Victor clicks the submit button	Yes	Yes	The user needs more feedback after submitting an order. We will implement some sort of alert system so the user knows whether or not their order has actually been placed.
12	Nick switches to his tab.	Yes	Yes	If Nick and James both had tabs open before Victor showed up, Nick should know how to switch between tabs now.
13	Nick taps on his total	Mostly	Yes	It may be confusing or unclear that you click your total to go to payment screen.
14	Nick clicks pay with card and taps his card on reader	Yes	Yes	Should be intuitive.
15	James performs steps 12-14 for his own tab.	Yes	Yes	Same reasons as above.
16	Victor taps on his total.	Mostly	Yes	After seeing Nick and James perform this task, he knows how to reach the payment screen.

17	Victor clicks pay with cash.	Yes	Yes	Clicking the button automatically calls the server over.
18	Victor hands the server his money	Yes	Yes	He wants to pay and tip so that he may leave.

6.1.5 Task 5: Jacob & Jamie

Step No.	*Step Description*	*Knowledgeable?*	*Motivated?*	*Comments / Solutions*
1	Jacob clicks "add tab"	Yes, he knows how to use a touchscreen.	No, since both Jacob and Jamie are going to be on the same tab Jacob would rather not have to set up his tab.	If there is only going to be one tab, we could have the first one automatically set up so the user order food/drinks right away. Then if people want to add their own tab they can still do so later
2	Jacob enters his name and clicks submit	Yes, he knows how to use a touchscreen keyboard and click a button.	No, see above…	Instead of the above option we could also have it set up so that "Customer 1" or something along those lines is already pre-entered in the input box. Then the user only needs to push submit.
3	The special screen opens automatically. Jacob and Jamie read through the specials.	Yes, he knows how to scroll a touchscreen.	Yes, both Jacob and Jamie are interested in seeing what the daily specials are.	The specials are the first screen to pop up so that the user is attracted to them and is more likely to purchase those items.
4	Jacob taps on the Steak Sandwich icon.	Yes	Yes, both Jacob and Jamie want a steak sandwich.	The icon has the name, price and a picture so the user has lots of information about the item.
5	Jacob taps on the "+" button to add another Steak Sandwich	Yes, it's intuitive for someone with knowledge of technology and mobile applications	Yes, both him and Jamie want a Steak Sandwich.	This is an easy way for the user to add multiple of an item. It saves the user several actions.
6	Jacob taps on "Add to Tray"	Yes	Yes, he wants to order the item.	"Add to Tray" should be intuitive for someone who shops online as it's a play on the words "Add to Cart".

7	Jacob taps on the wine icon.	Yes	Yes, he wants to order a glass of wine.	The icon has the name, price and a picture so the user has lots of information about the item.
8	Jacob taps on the “+” button to add another glass of wine.	Yes	Yes, both him and Jamie want a Glass of wine.	This is an easy way for the user to add multiple of an item. It saves the user several actions.
9	Jacob taps on “Add to Tray”	Yes	Yes, he wants to order the item.	“Add to Tray” should be intuitive for someone who shops online as it’s a play on the words “Add to Cart”.
10	Clicks submit order.	Yes	Yes, he wants his items ordered.	The user needs more feedback after submitting an order. We will implement some sort of alert system so the user knows whether or not their order has actually been placed.
11	Jacob clicks his total to go to payment screen.	Mostly	Yes	It may be confusing or unclear that you click your total to go to payment screen.
12	Jacob clicks pay with card and taps his card on reader.	Yes	Yes	Users who have used the automatic tills at the grocery store or with debt will make this intuitive.

6.2 Discussion

6.2.1 Task 1 Discussion

The main problem we encountered with Greg was when he went to pay, it wasn't clear that he needed to press total in order to see his tab / bill and the payment options. We can rectify this issue by putting a pay now button beside or underneath the tab total. This should make it clear that you are trying to access and where to access the payment screen.

Another issue noted was that there was no quick way for Julio to find Rickards Red. He had to scroll with his finger to Rickards Red. This could be fixed by adding a scroll bar, this would let the user know how far down the list they are as well as drag it to scroll faster. The beer menu is small enough at Kilkenny's that it would not make sense for a search bar.

6.2.2 Task 2 Discussion

When Mary was interacting with the system, we figured that the "Add to Tray" may be confusing for first time users. To remedy this when a user clicks on an item for the first time, the help message explaining how the function works will be automatically displayed for about a few seconds then fade away. This will ensure that the user understands what the functionality of the order queue. In the order overlay where Mary selects the wing flavor the system will include all the options as labels, paired with the appropriate input box. In Mary's case, there would be a "flavour" label, accompanied by a dropdown input with the list of flavors to select.

6.2.3 Task 3 Discussion

The main complaint we found for this walkthrough aside from the issues already discussed above was that it might not be intuitive on how you remove items from the queue. We also saw that users might actually delete items if the minus button is always beside every item in the queue / tray. A possible solution would be to require users to long press on the item or slide it to the right and then a delete button would appear. This action would be described in the help dialog as well as prevent users from accidentally deleting their items.

6.2.4 Task 4 Discussion

Towards the end of his stay, when Victor pressed the cash payment method, there was no obvious way to determine that a server had been called. Unless there is visual or audio feedback that the server has been called or is already on the way, users can become confused or frustrated

if they think the system is malfunctioning. To fix this problem, we can add a toast notification or alert dialog to inform the user that the server has been notified in some way.

6.2.5 Task 5 Discussion

Jacob does not have the initial motivation to add a tab for himself. This is because both him and Jamie will be the only ones ordering from this table and will be on the same tab. In order to fix this problem, we will automatically have a tab created for the first user. The user will able to edit the name for that tab if he wants to, but it will not be required. The second user will still be able to add new tabs so that they can keep track of their items on separate bills.

6.2.6 Summary Discussion

After these walkthroughs, we believe that the interface is well designed to handle food and drink orders. However, there are quite a few points in the process that could benefit from giving the user direct feedback after they complete major tasks. For example, when a user submits their order to the bar/kitchen or when they call for a server. It is important for us, down the road, to consider that other users won't immediately accept that things are working properly. Some form of feedback will help to accomplish this. If users can see that confirmation of their actions, it will prevent them from getting frustrated or confused. Additionally, we will need to address the way that people get to the Payment tab. Currently the only way to do that is to tap the total in the bottom right corner, and in retrospect is completely unintuitive. This could be easily fixed by adding a button that conveys this in a more straightforward fashion.

7. Appendix

7.1 Prototype 1

7.2 Prototype 2

7.3 Prototype 3

7.4 Prototype 4

7.5 Prototype 5

8. Horizontal Prototype

8.1 Redesign Rationale

Our Prototype Redesign mainly consists of minor changes we made throughout the interface that helped eliminate some of the issues we encountered during the walkthroughs, as well as some other quirks we found while going through our prototypes before creating the horizontal prototype. Many of these quirks are minor, such as the positioning of some elements; however we feel that the changes have greatly improved the feel and ease of use of our system.

The first change that people will notice when looking at our horizontal prototype, is the theming we chose. This is especially noticeable on the welcome screen and helps set the feel of the application. When we started to create it on the computer, we noticed that it was very unappealing and offsetting. This was a problem, as we want users to enjoy using our system, so that they use it instead of calling a server to place their orders. In our redesign, we created a very colorful and modern looking system, using patterns and shadows to create interest on the screen. This additional interest on the screen helps draw the eye in and makes the system much more appealing. We believe that the welcome / first screen is especially important to get the theme or 'look and feel' right on, as it is the first screen that the users experience. This is very important as it makes or breaks the user's decision to continue using the application or simply flag down the server.

This theming continues throughout the interfaces, so that our system has a complete feel. In other words, it does not look as though we have four different applications that we threw together to create this one system. We also used standard colour coding for submit and cancel buttons (green and red respectively) to help reinforce what each one does.

Next, we changed the screen to add a new tab so that it is a popup screen. In our original prototype, we had the input fields and buttons simply show up in the main window area. This meant that users were still able to press the specials, drink, food, etc. buttons on the add tab screen. We needed to ensure users create a tab; both to split orders amongst others at the table and to ensure the bar doesn't lose money as a result of skipped tabs. The popup can be cancelled in the redesign; however, they will be brought back to the welcome screen until they have created a tab. We found this made it very clear to users that they must create a tab to continue.

Once a user is on the main window, the window where you pick and order food or drink, the largest change we made aside from the new theme was the clarity of the order queue. In the initial prototype, it was unclear what the queue was and did, and how a user paid for their order. The initial prototype simply had the tab name with their current total in the bottom right hand corner and an expand button above it. To pay for an order a user needed to click their name / tab total and they would be taken to the payment screen. This was very unclear, as there was no indication this was a button, and even if the user knew it was a button, there was no indication what the button did. To remedy this, we made it so that the tab name and current total are no longer a button; instead, there is a button directly beside them labelled 'Pay Now'. This makes it quite a bit clearer where users need to click to pay for their tab.

In the initial prototype, it was a little unclear what the tray / queue was or did. At first, we thought that a tiny help button beside the "add to tray" button when you were ordering a menu item would

resolve the issue. However, we noticed that in the applications we used all around us we have very rarely used those tiny help buttons. We also noticed that changing the text from simply ‘submit’ to ‘submit order’ in the tray itself eliminated the potential confusion from before. It is also worth noting that once implemented further the animation of adding an item to the tray will clarify the purpose and role of the tray immensely. Please also note this is an area of the redesign we are still not satisfied with and will revisit in the future.

We also changed the payment screen so that it was a popup window as well, instead of simply changing the contents of the main window. This was done mainly for aesthetic reasons. In our opinion, it looks a lot better to have the payment screen popup above the current window, where you see a summary of your tab and then have nice icons and text letting you pay with cash or card. This also is closer to the standards that you find across many different systems and should therefore lead to less confusion when using our system. We also added a large ‘Pay Now’ button at the bottom of the window, after you have selected a method, which is a lot clearer than our previous design, where it simply listed the totals and had a cash button and a card button.

Across our specials, drink, and food screens we made a few minor changes to the way menu items are displayed. The first is we increased the size of each menu item, so that there is a much greater focus on the pictures of each item. “A picture says a thousand words”, and for this reason we found that increasing the size of the items really helped users see what the different options were. We also changed the way that switching between different sections of the menu works. For example, on the specials screen switching between food and drink. Before we had talked about having tabs like those found on a browser to switch between sections, as we found through our walkthroughs that simply scrolling through the menu was too much of a hassle. However, upon further consideration we found that the tabs, did not easily lend themselves to our system and they looked bad. Instead, we opted for a hybrid between the two: buttons that link to the different menu sections. So clicking on the food button will automatically scroll to the food menu section. We found this combines the intuitive nature of the scrolling with the ease and convenience of the tabs.

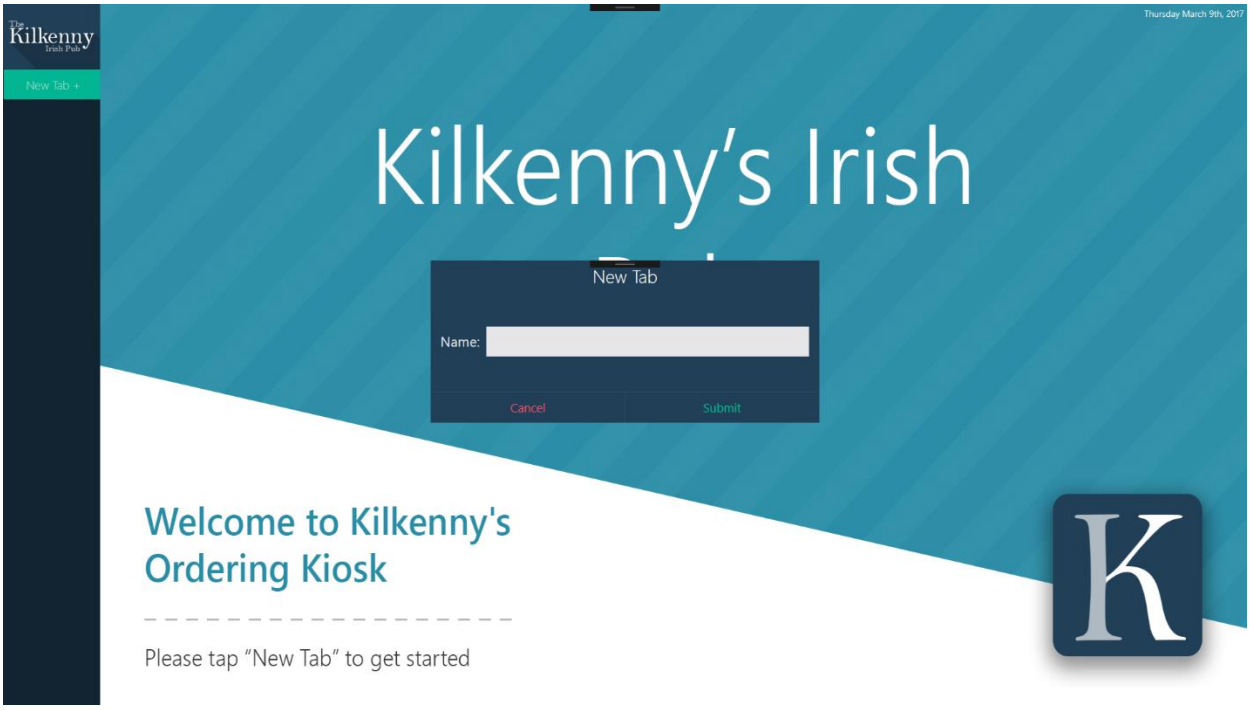
Finally, we changed that screen that shows up when you press an item found in the menu. This screen allows users to place several these items into their tray, or just learn more about it. The two major changes we made on this screen was moving the quantity selector to be next to the ‘Add to Tray’ button, and increasing the size of the image. We moved the button so that all the ordering controls were grouped together; this felt much more intuitive and made a lot more sense to us, rather than reaching to different parts of the screen to accomplish a simple task. The increase in image size, as mentioned above was simply to make the food more appealing, and allow the user to get a better look at what they were thinking of ordering.

In conclusion, we have made quite a few minor changes to our system, which helped improve its overall ‘look and feel’ as well as its usability. We also decided to change the theme of the system quite a bit, so that is was much more enticing to the Kilkenny’s patrons. However, our system is not yet perfect. We have noticed a few issues along the way, such as the confusion surrounding the ‘Add to Tray’ button, and we are not completely satisfied with our solution. These issues will require usability testing to help us gain a better idea of what works and what doesn’t. Regardless, we believe that our new redesign has made significant improvements, over the initial prototype through the minor changes we made.

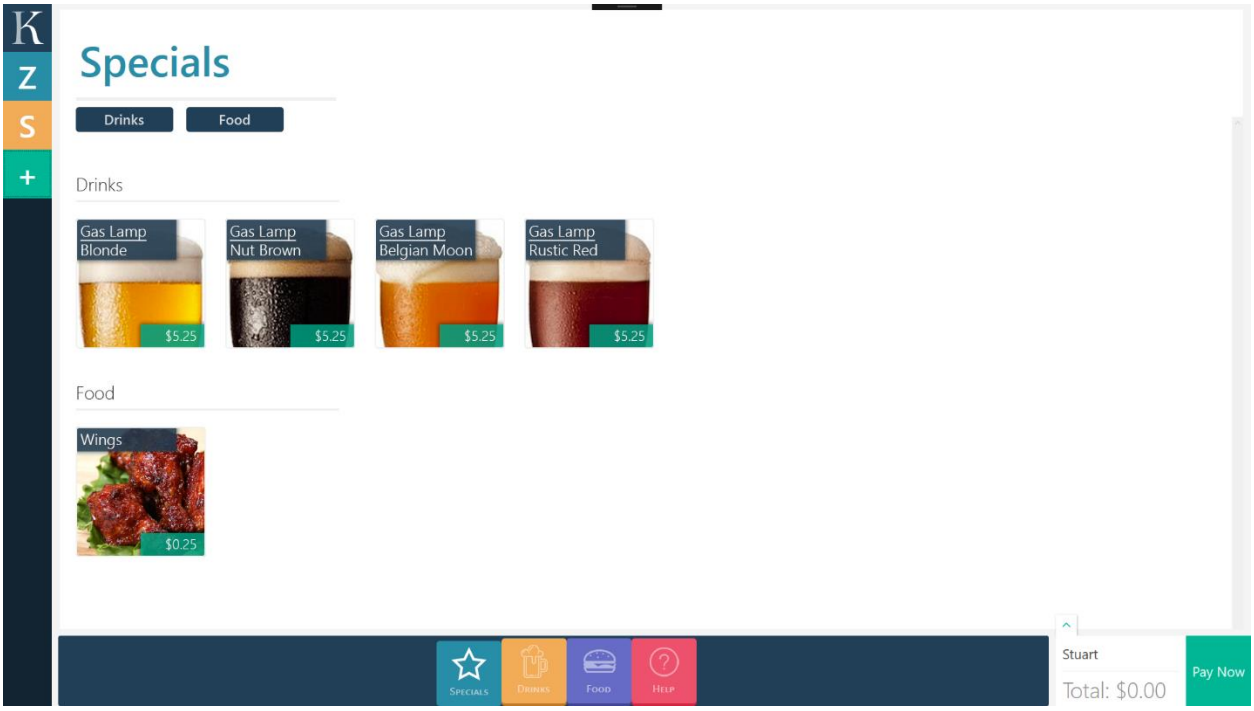
8.2 Horizontal Prototype Screenshots

Welcome Screen

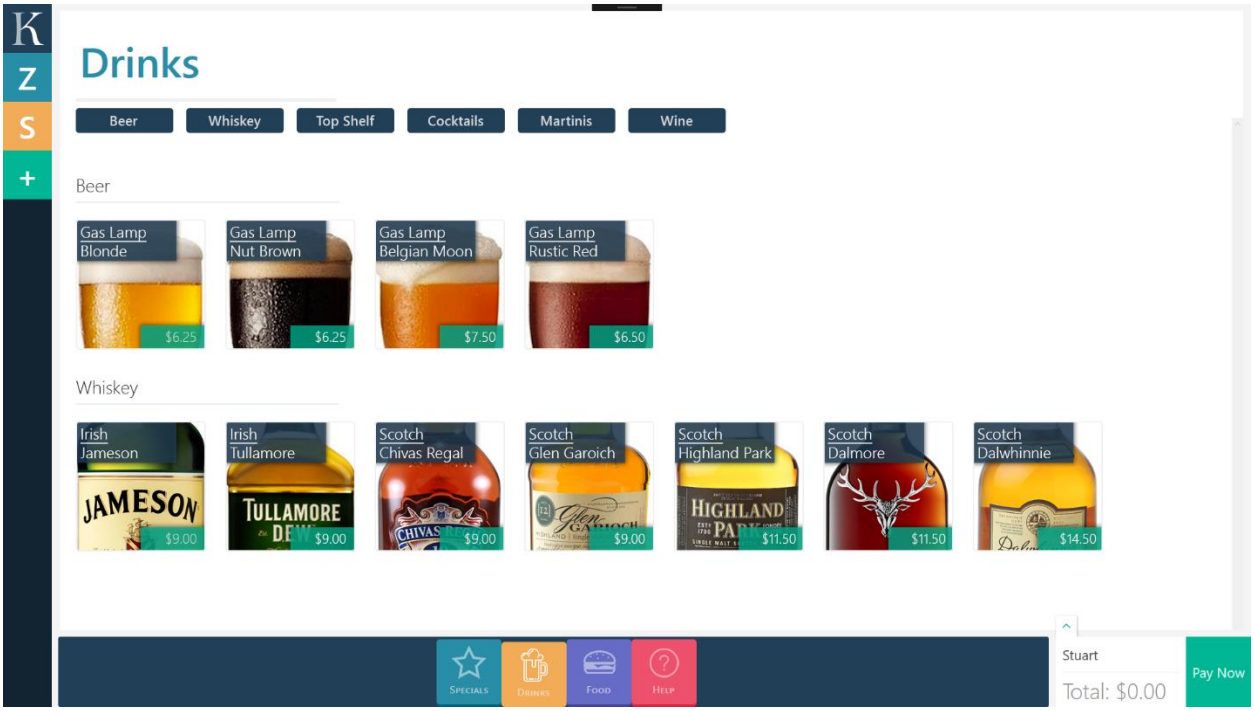
New Tab Popup



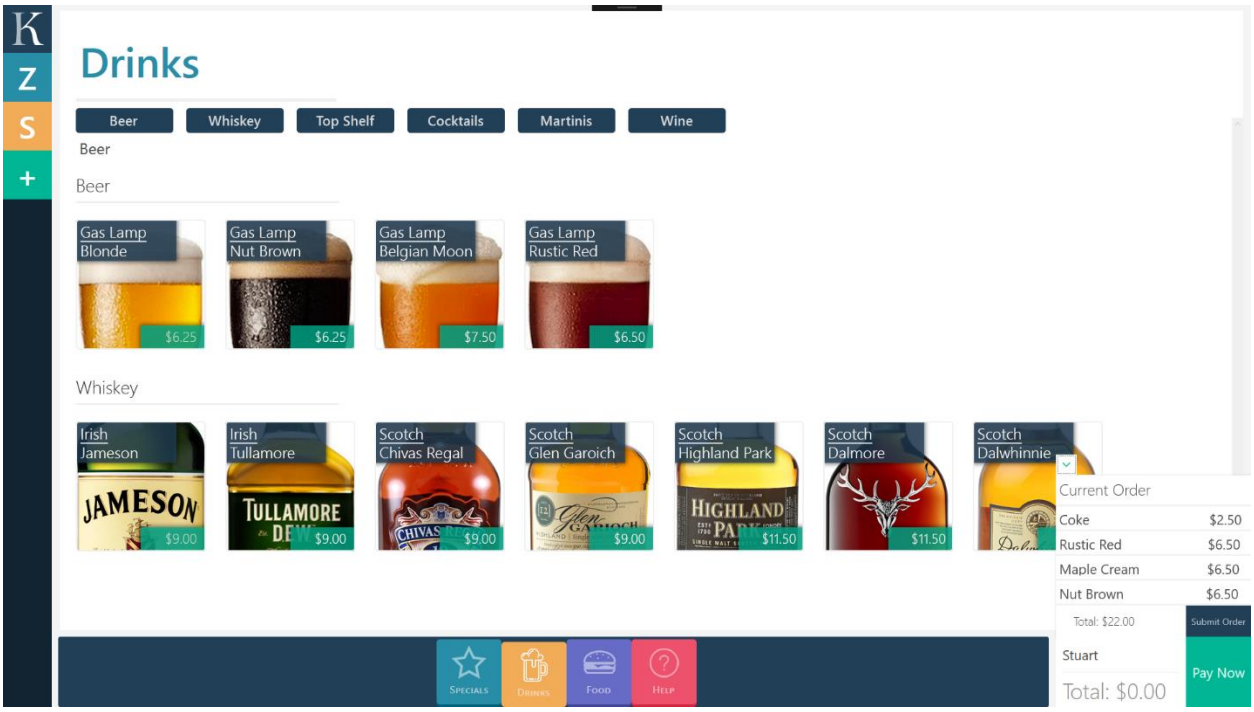
Specials Screen



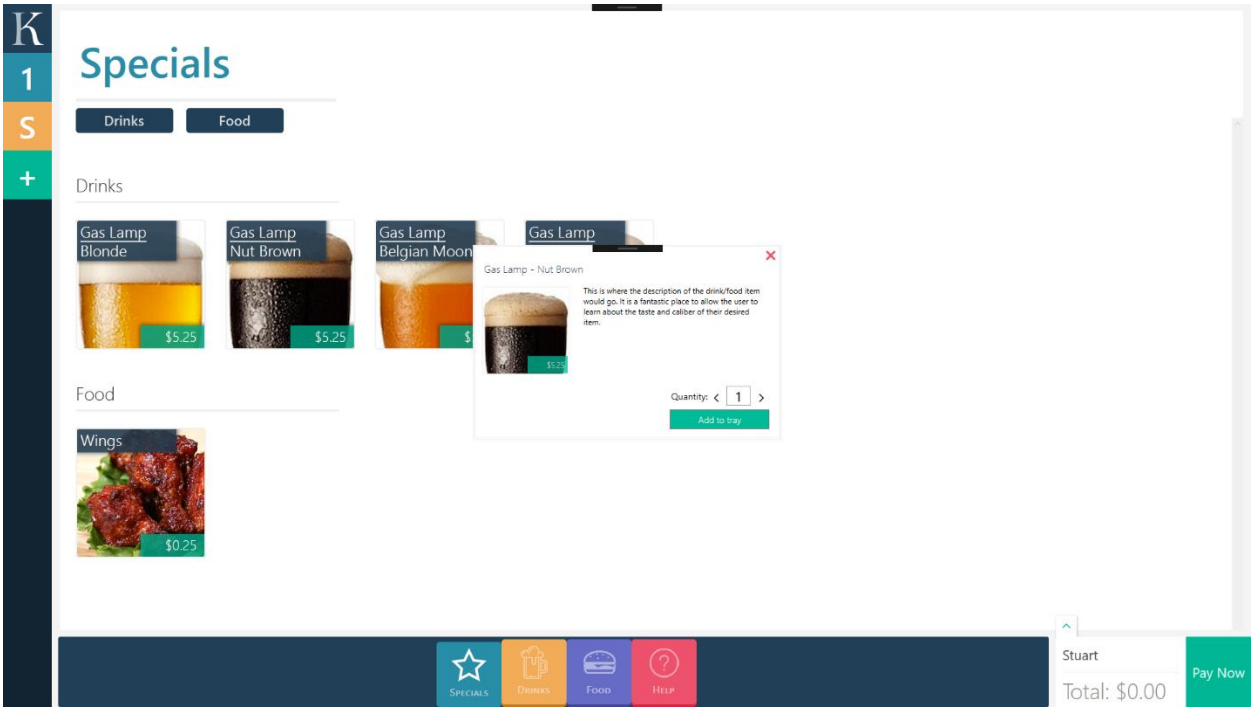
Drinks Screen



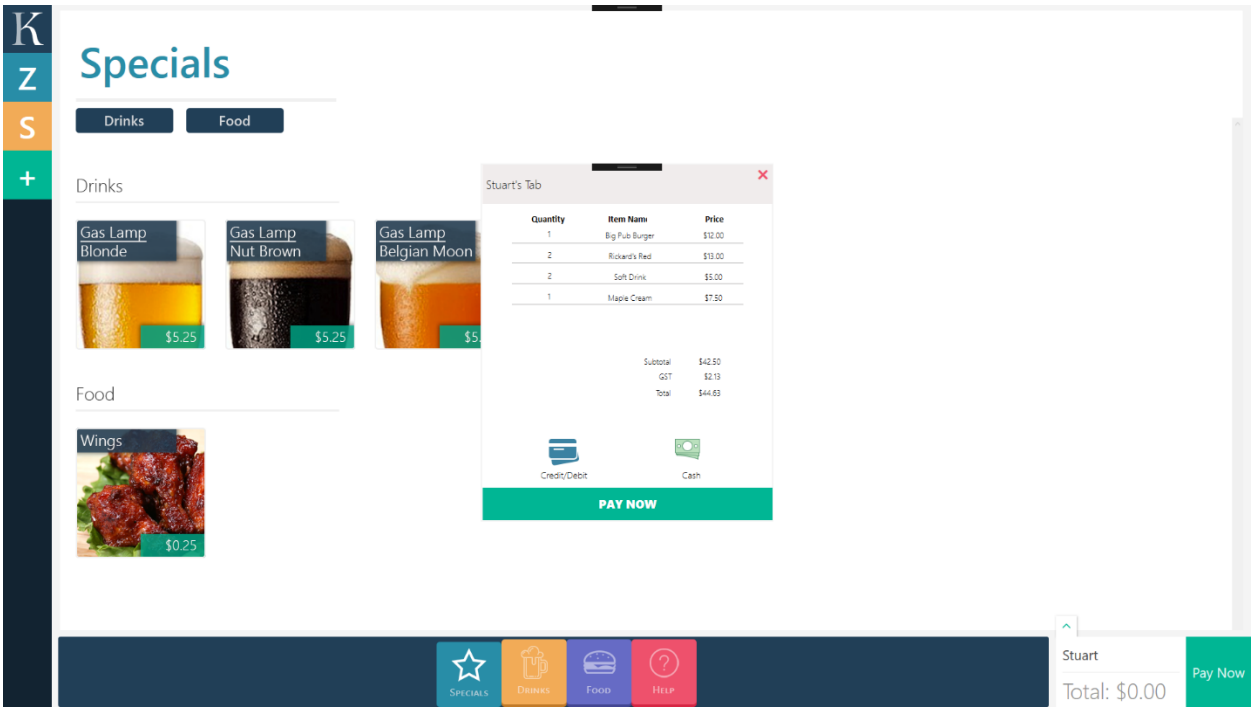
Expanded Tray



Examine Item Screen



Payment Screen



9. Vertical Prototype

9.1 Final Design Rational

Major Changes

When doing the redesign we really tried to focus on the usability of our system when deployed on a 1980 x 1080, touchscreen interface. In our horizontal prototype, the overlay boxes were so small they were unusable. We increased the size on dialogue boxes so that the user can actually interact with the screen and read the text displayed.

We also overhauled our user notification system. Now all errors or tasks a user should be aware of are displayed in consistent screen overlay boxes. These overlays clearly and decisively relay important information to the user.

Rational Behind Design Changes

While redesigning our horizontal prototype we tried to make sure that the user would always know what is currently going on in our system. One of the larger problems in the horizontal prototype was that users were having trouble distinguishing whose tab was currently active in the system. Although originally we would display the user's name in the bottom right corner of the screen, we soon realized that was not enough information for the user to recognize intuitively the current active tab. Therefore, we made sure to colour match the tab heading in the side panel to the box on the bottom right, which contains the tab name. We also implemented an animation in the tab side menu so that a user is visually aware when a tab is added/changed.

After evaluating our system, we found that users were unaware whether a certain function was available for use. In order to solve this we decided to make a greyed out button our universal symbol for when functionality is disabled. For example if a user creates a new tab and has not yet ordered anything, the pay now button will be greyed out. This prevents the user from paying when their tab is at $0.00.

We also found that users were sometimes confused as to which page they were on (e.g. Specials, Drinks, and Food); this is because it was hard to distinguish which button was active. To fix this we created some contrast between the different text states and added a glow.

Quality of System Design

Design Strengths

Our ordering kiosk has come together very well, we feel that our system is very user friendly and meets the usability requirements we set out to achieve. The users are able to:

- Create their own separate tabs to keep track of individual orders
- Order food and drinks
- Due to our tray system implementation (ordering queue), users are able to add, remove and review items before sending them to the kitchen/bar
- Able to order most drinks from the actual Kilkenny Irish Pub menu

- Able to order most food from the Kilkenny Irish Pub menu
- Pay for their orders
- Customize food orders
- Call a server for assistance
- Browse real-time daily specials
- Remove empty unused tabs

This meets all the requirements outlined in 4 Tentative List of Requirements , for everything in 4.1 Absolutely Must Include and 4.2 Should Include. Our system will work well in a real life situation with hooks into the POS system and database.

Our system is also very intuitive and gives the user optimal feedback so that they have the appropriate information to navigate the application.

Major Problems

Order Information Problem:

The biggest issue our system currently faces is the extra information displayed about a user's order in the queue and payment screen. For example if a user places multiple orders of wings, which vary in flavour, the description of the item may become too long to display in the queue and payment screen. Currently there is also no implementation to display user's custom notes on food items.

Tab Switching Bug:

There is also a bug when users quickly switch between tabs, which causes the animation to freeze and temporarily freezes a tab to full extension.

Potential Solutions

Order Information Problem:

For the food options (wing flavors) when an order of wings is placed with a different flavour, it should be placed into the queue as a separate item. Wings of the same flavour should display as:

Honey Garlic Wings x2 $XX.XX

Where as different flavoured wings should display as:

Honey Garlic Wings x2 $XX.XX

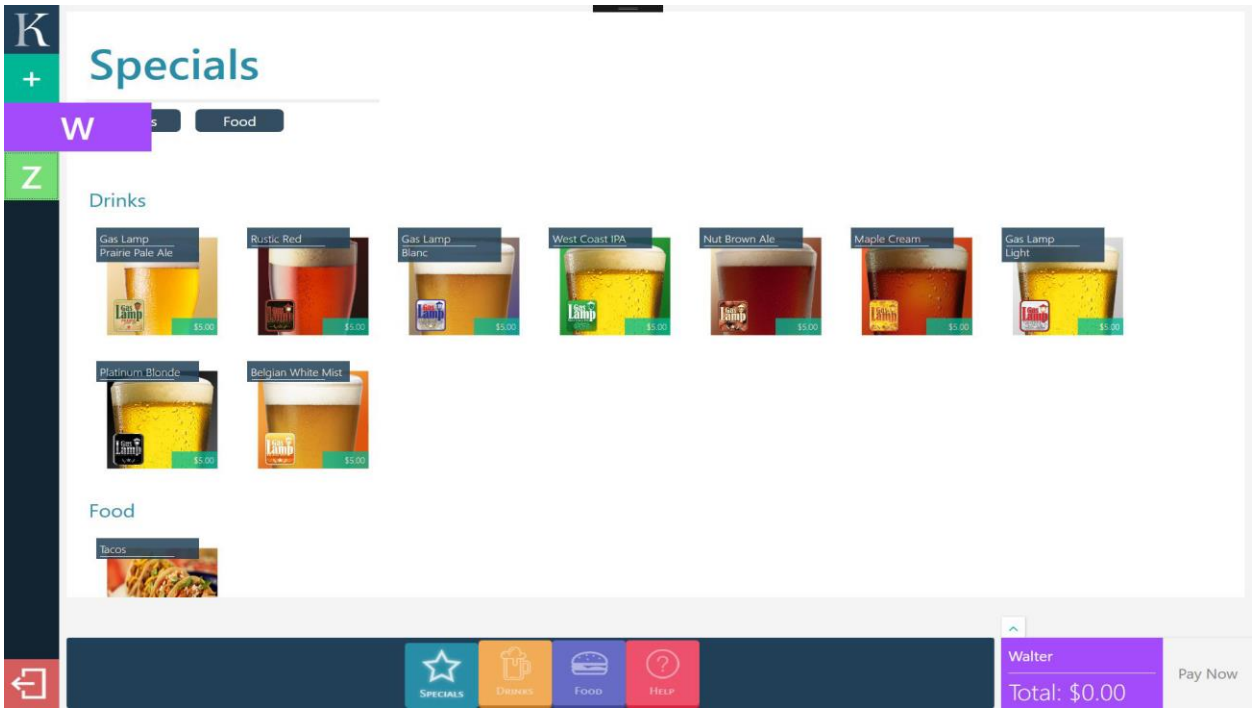
Buffalo Hot Wings x1 $XX.XX

Tab Switching Bug:

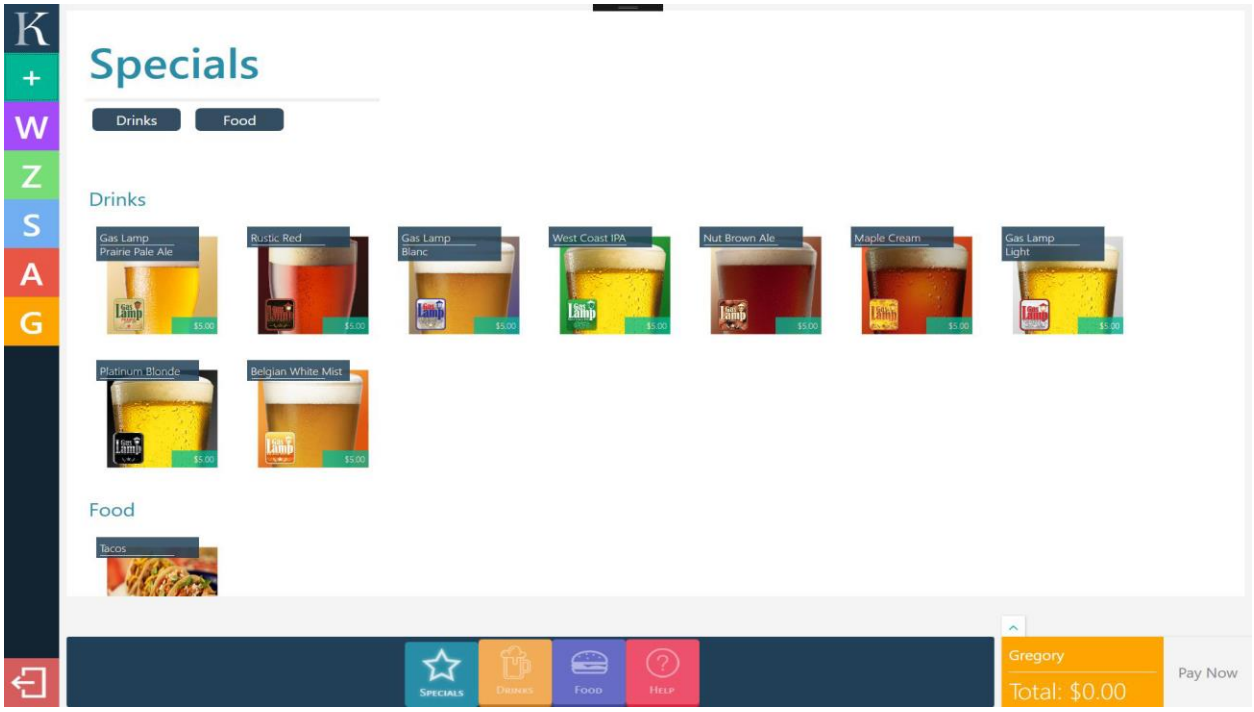
We would need to implement some sort of a catch, which automatically sets all inactive user tabs to a specific width after a switch is made.

9.2 Final Design Screenshots

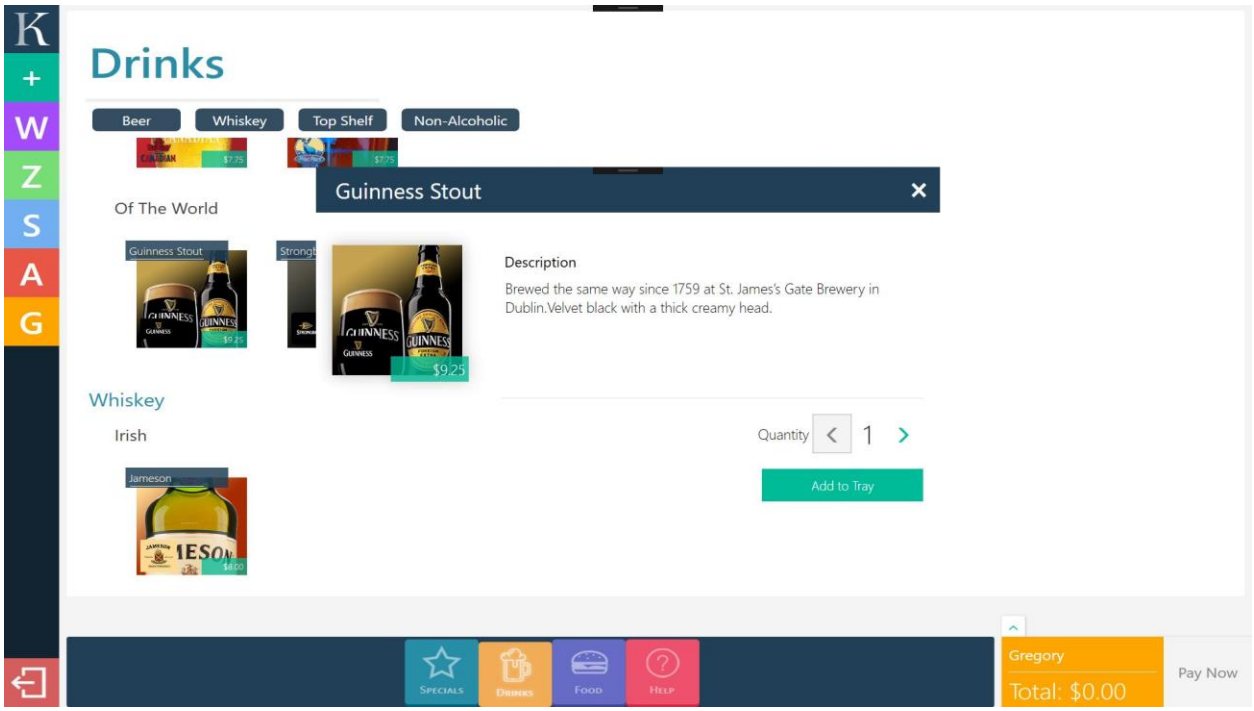
Tab Animation



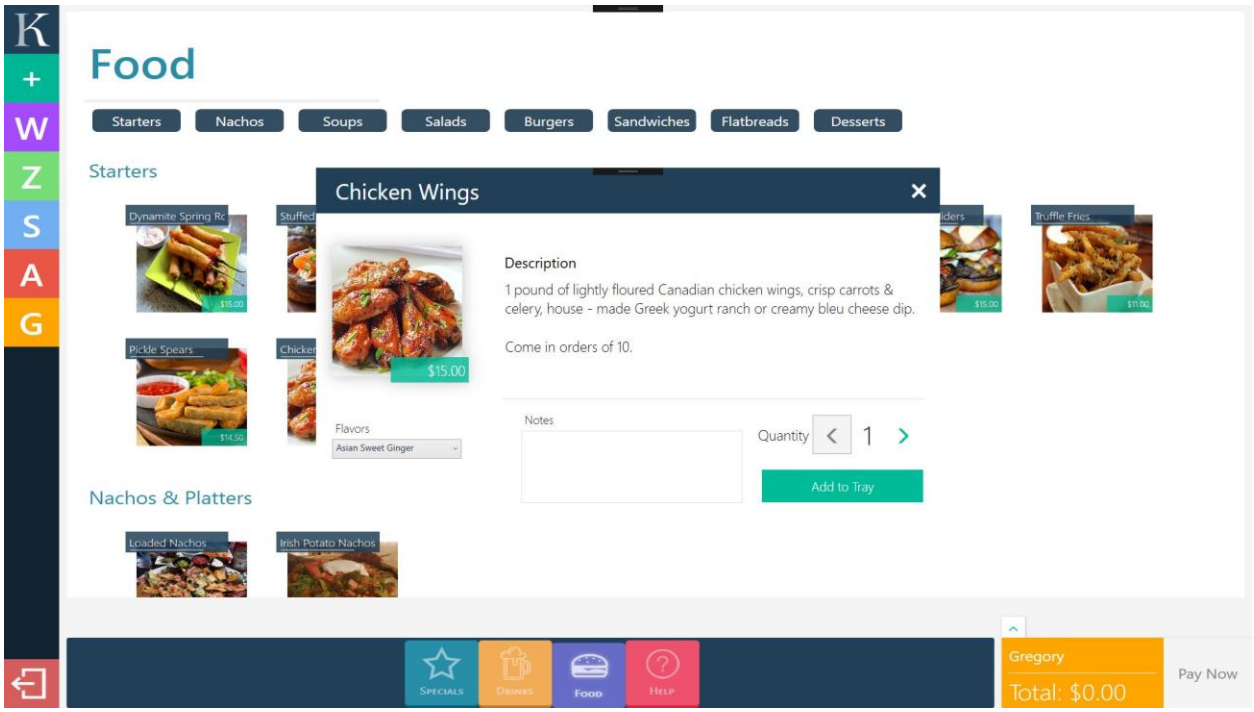
Multiple Tabs



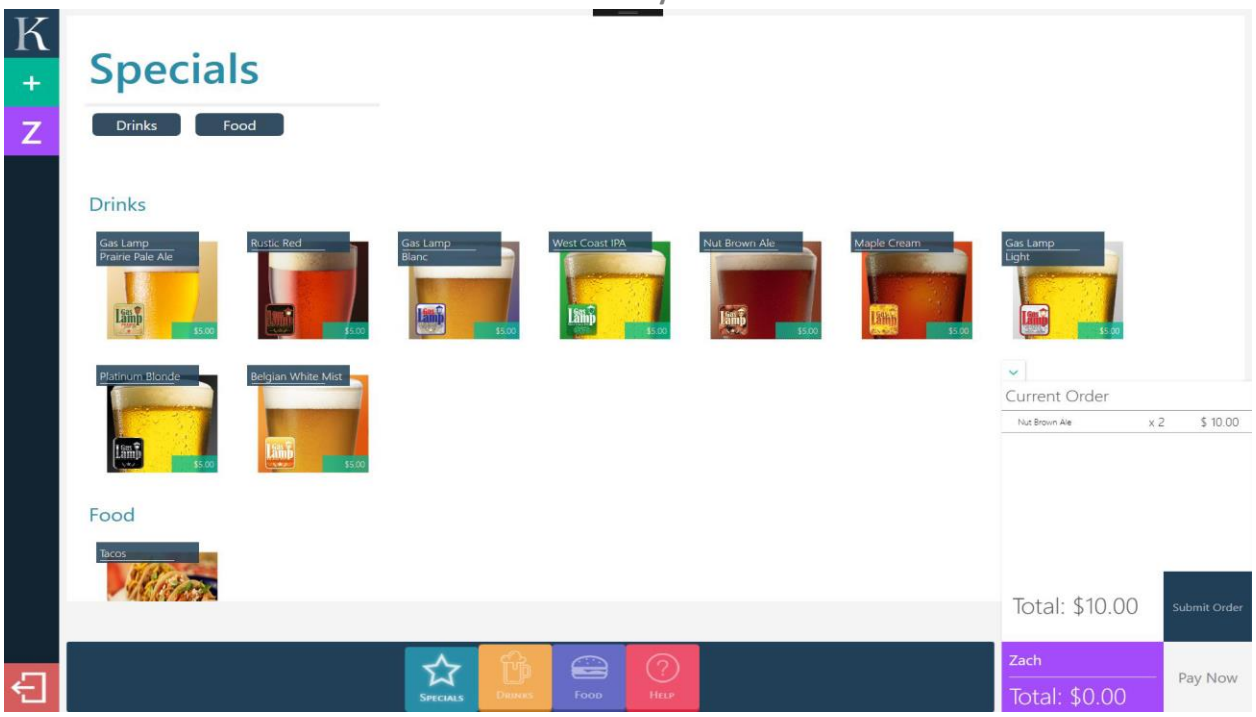
Examine Drink



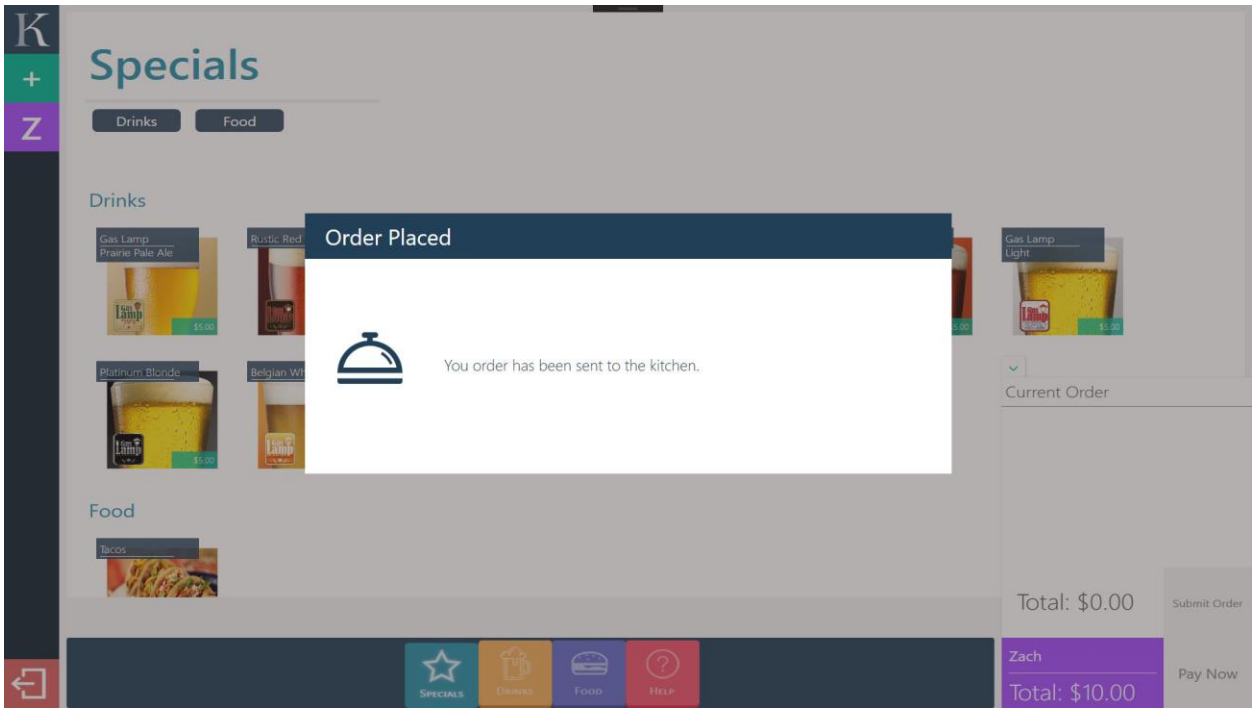
Examine Food



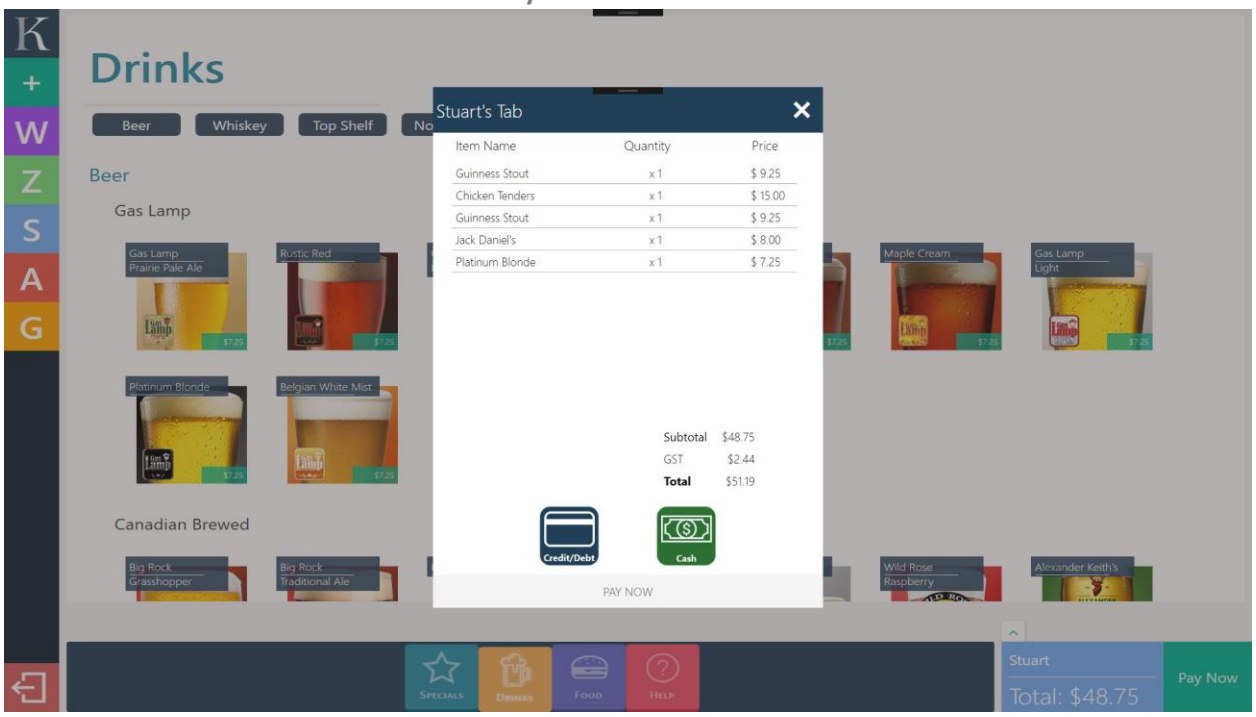
Order Tray



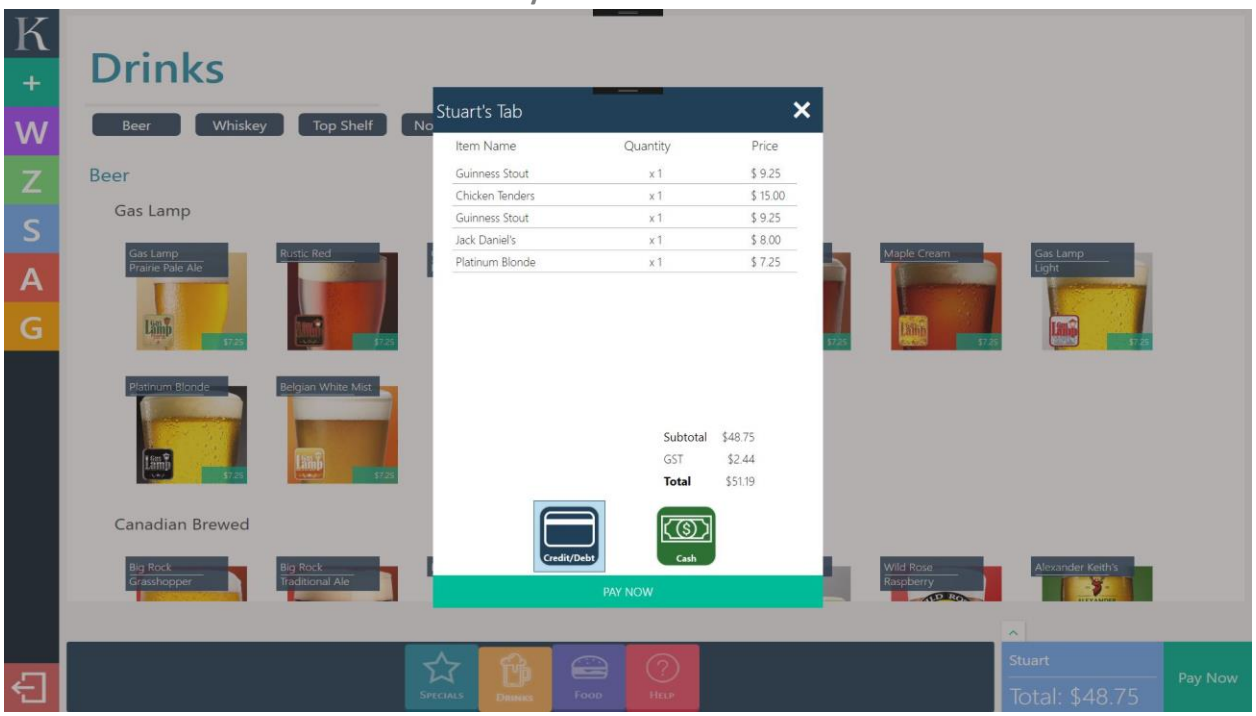
Order Sent



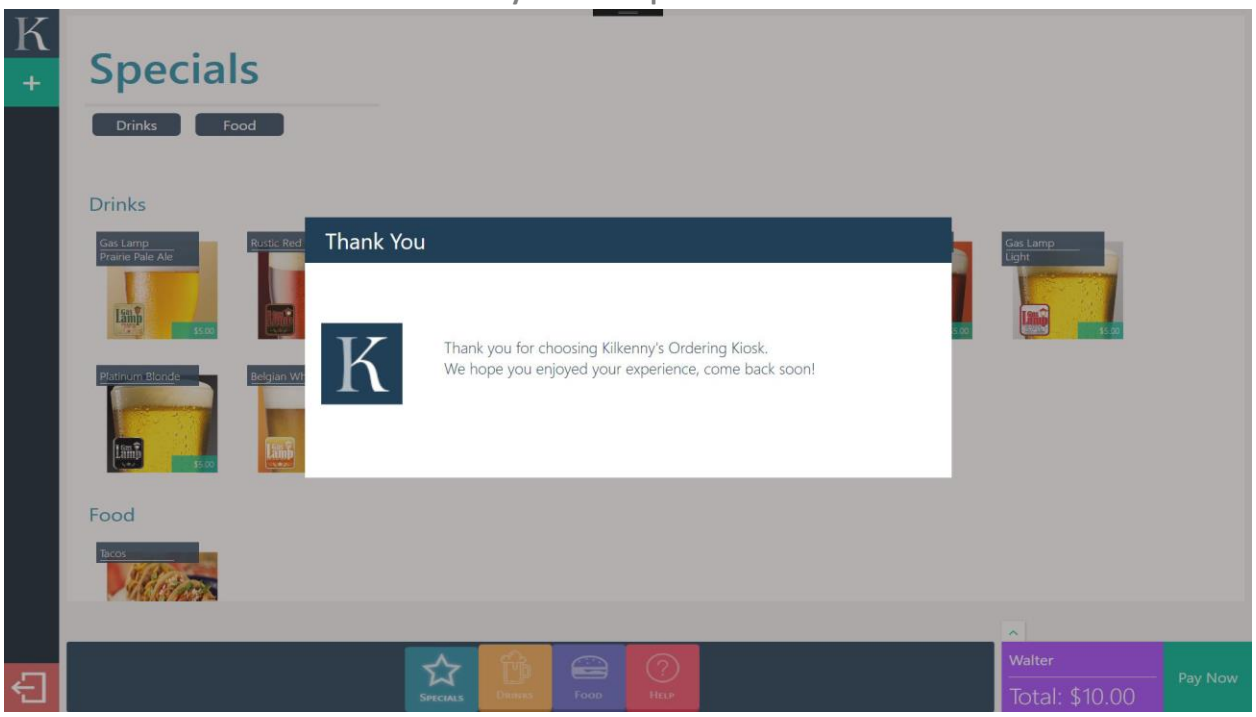
Payment Disabled



Payment Enabled



Payment Completed



9.3 Heuristic Evaluation

Visibility of System Status

Problem	Potential Solution	Severity Rating
When switching between tabs the system has a tendency to hang for a certain amount of time, depending on the amount of information loaded.	Add in some sort of indication that the application is loading in items so that the user knows the system is still working.	3
For the food options (wing flavors) when an order of wings is placed with a different flavour, the text is to long for a user to read.	Different wings flavours should be placed as different items into the order queue	2
If users switch tabs quickly the animation gets hung. The previous active tab indicator is fully extended.	Some sort of catch needs to be implemented to set all inactive tabs to the default width when a user switches tabs	1

User Control and Freedom

Problem	Potential Solution	Severity Rating
If a user wants to remove an item from the order queue, they have to click on the item. The item will then display a red x, which a user can tap to delete the item from the queue. This is not very intuitive.	Add “swipe to delete” functionality. Also add text below the queue reminding the user of this functionality.	2

Recognition Rather Than Recall

Problem	Potential Solution	Severity Rating
Multiple tabs can have the same name. This makes it difficult to distinguish between whose tab is whose.	Disable the same name from being used twice and prompt the user to add last name or initials instead.	2
After calling a server for help, the user has no indication that someone is still on the way after dismissing the dialogue box.	Implement some sort of icon or text in the top right, indicating the server is still coming.	2

Flexibility and Efficiency of Use

Problem	Potential Solution	Severity Rating
Experienced users have no way to navigate the system quickly. They have to click and scroll through items to get to what they want.	Add in search functionality.	2

Aesthetic and Minimalist Design

Problem	Potential Solution	Severity Rating
In the food/drinks menus, if an item is the same shade of green as the label it would be hard to read the price	Make better contrast for label and text.	1

Help and Documentation

Problem	Potential Solution	Severity Rating
There is not very much documentation to tell the user how to use the system.	Either add tutorials or help icons around the application.	2