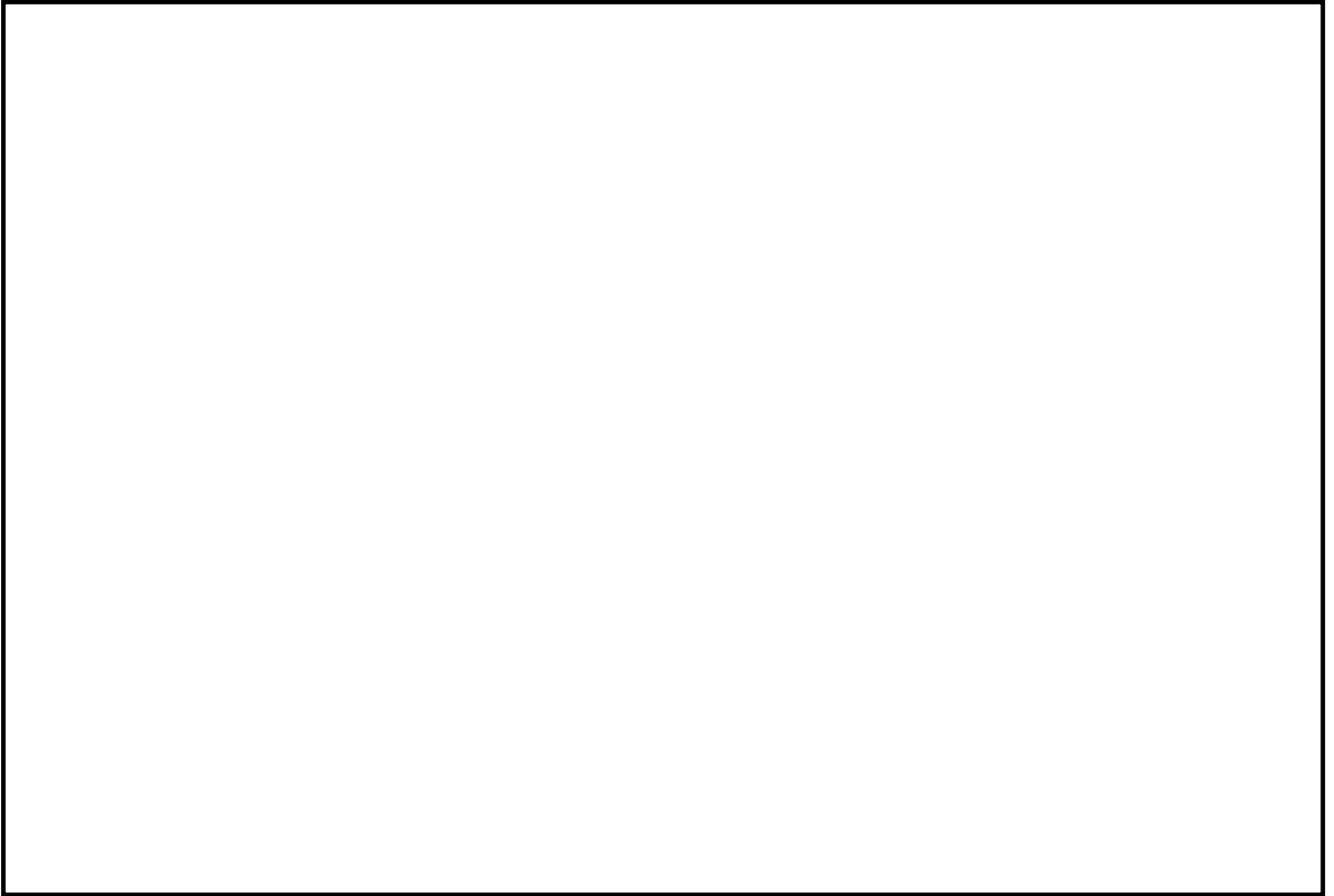


Fast-Food Kiosk

No waiting in the line anymore



CS5340 Assignment 3

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Full Design and Specification

Semantic Level Design

Homepage:

Function Name	Parameters (implicit/explicit)	Description	Feedback	Errors
Touch to start	implicit -	Redirects to the main menu page	Shows the main menu page	If the shop closes.

Menu Page:

Function Name	Parameters (implicit/explicit)	Description	Feedback	Errors
Add product	implicit - name of the product explicit - name of the product	Add food into the shopping bag	A dialog with a "A XX product is in your shopping bag!" Shows up.	If a customer clicks the product more than one time.
Choose different category	implicit & explicit - the category of food	Redirects to the chosen category page	Shows the menu of the chosen category	/
Go back	/	Redirects to previous page	Shows the previous page	/

Customize page:

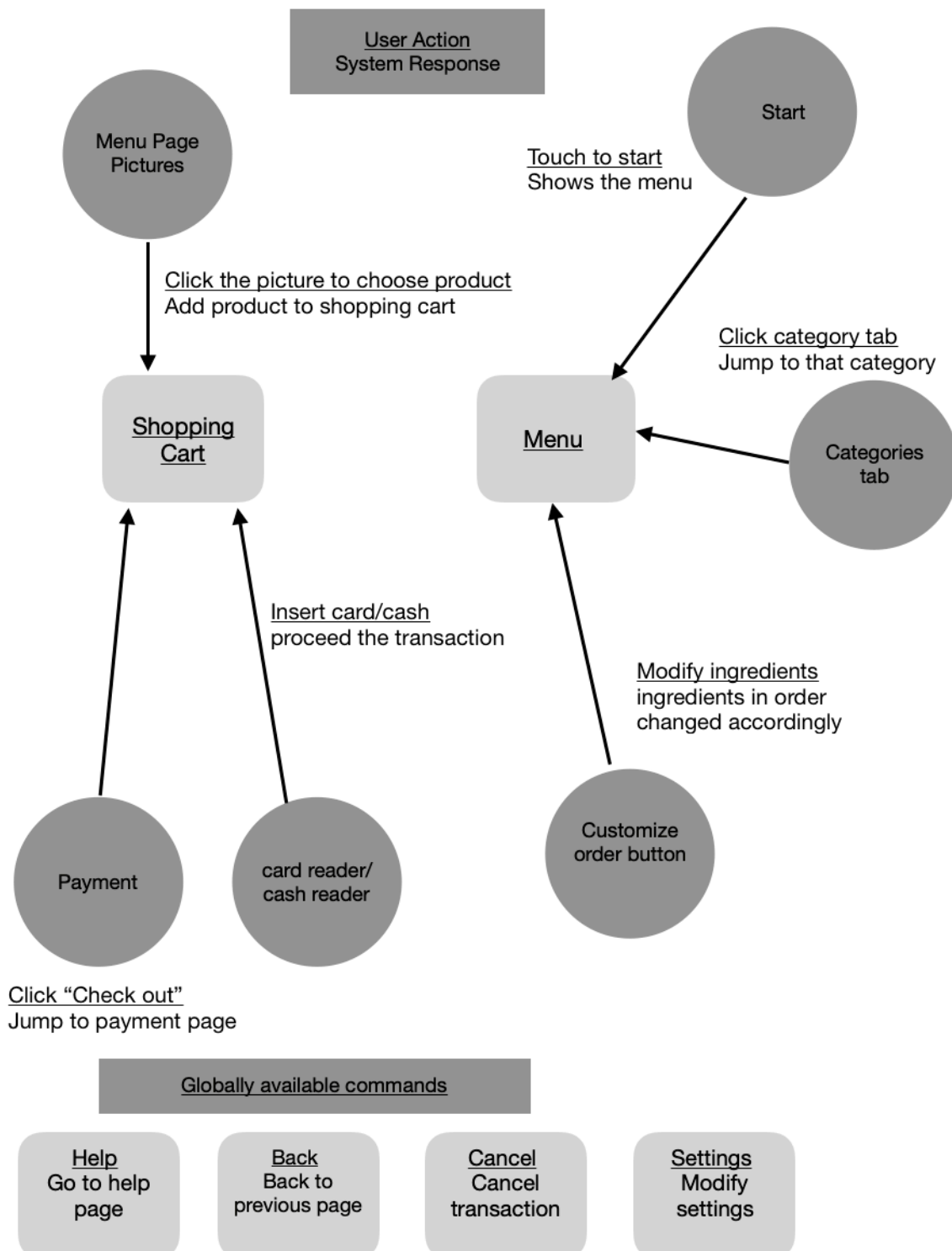
Function Name	Parameters (implicit/explicit)	Description	Feedback	Errors
Modify ingredients	implicit & explicit - name and quantity of each ingredients	Modifies the ingredients of food	The number of each ingredient shows besides	If the number of an ingredient is zero and the customer keep deleting it.

Payment:

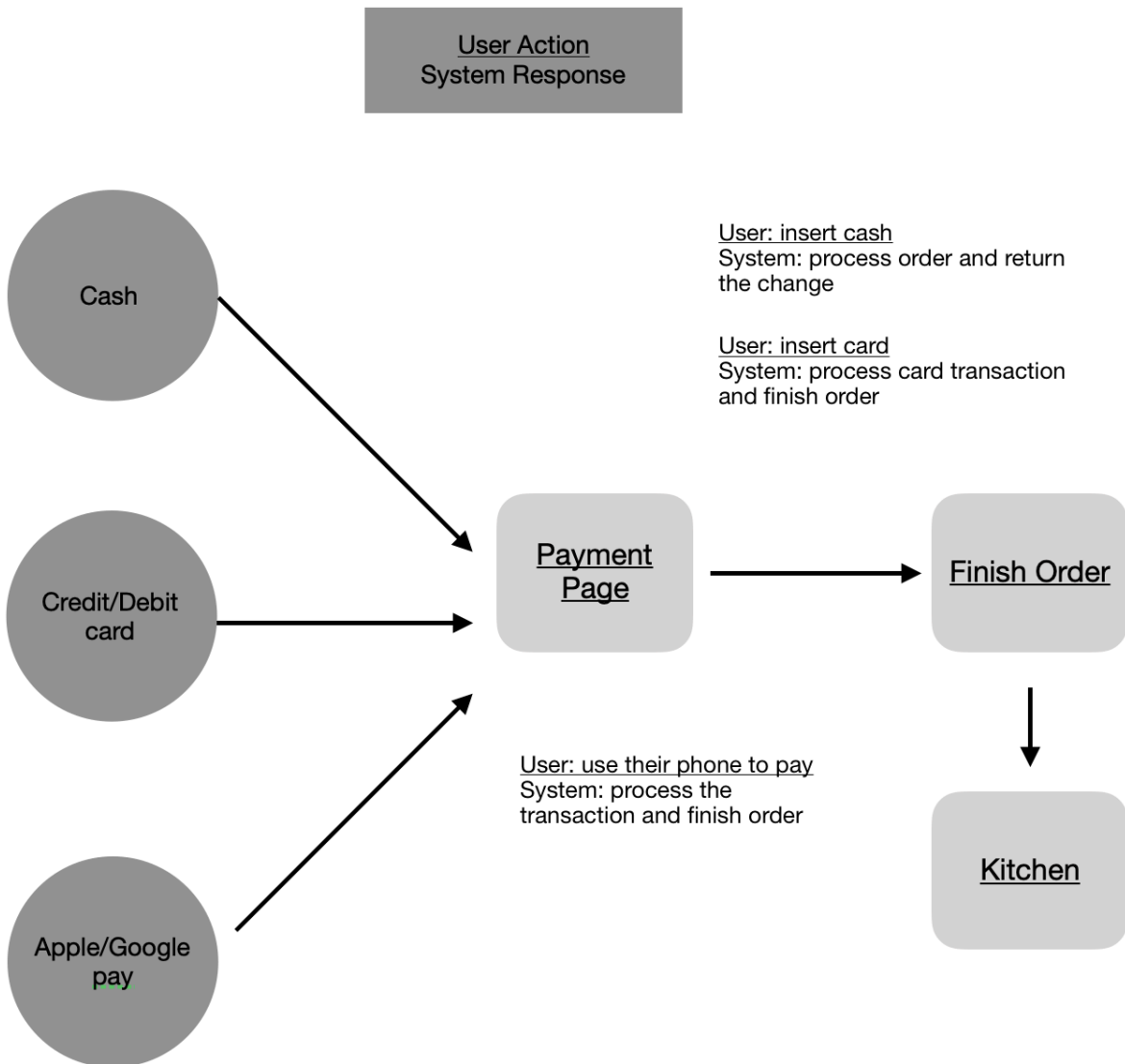
Function Name	Parameters (implicit/explicit)	Description	Feedback	Errors
Insert card	implicit & explicit - total price and payment method	Transfers the money from customer's card	A dialog with "Please insert your card" shows up.	If the authorization process is denied.
Insert cash	implicit & explicit - total price and payment method	Collects the cash from the customer	A dialog with "Please insert cash" shows up.	If the cash is not recognized.

Syntactic Diagram

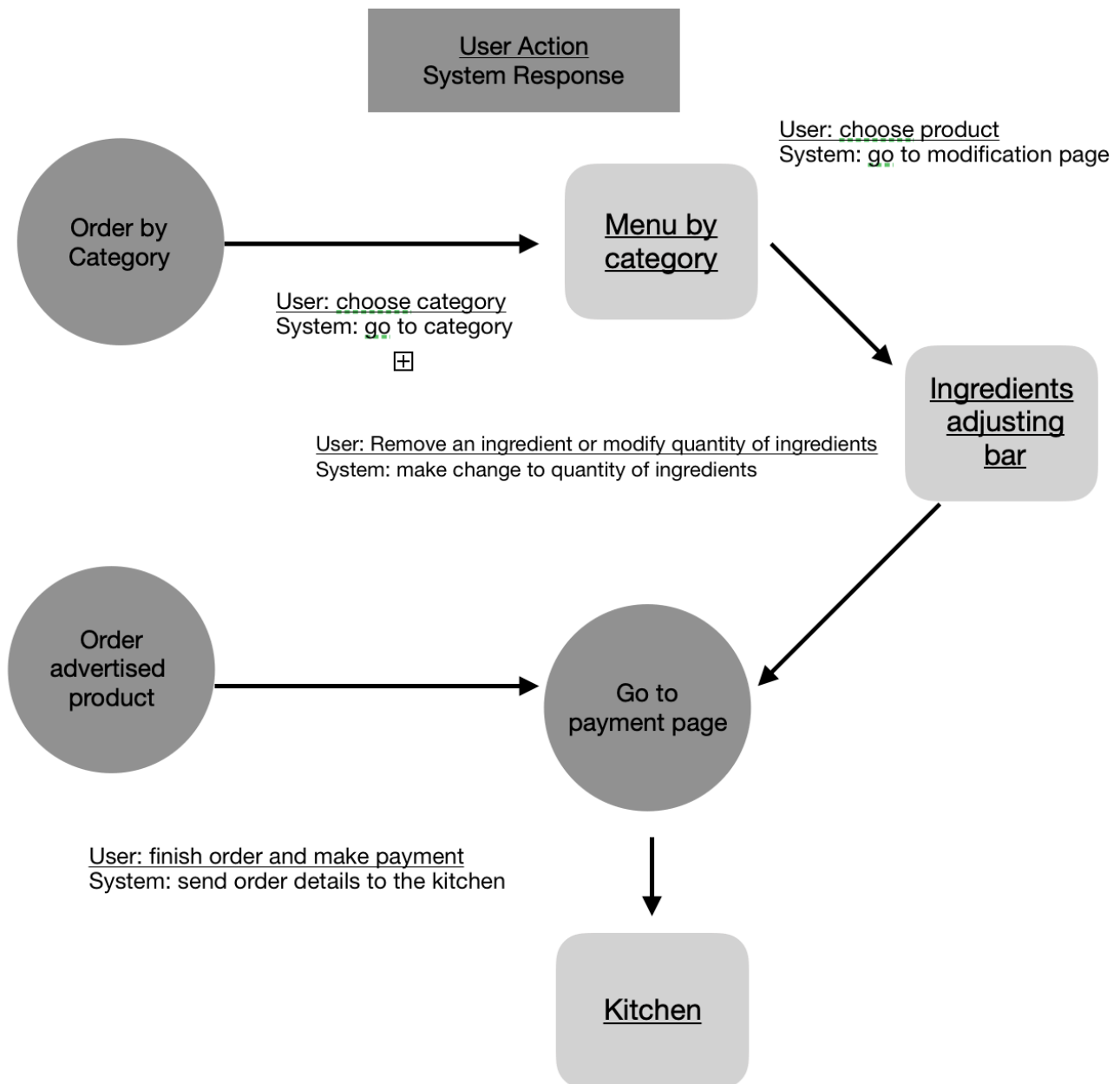
1. Overall Diagram



2. Order System Diagram



3. Payment System Diagram



Lexical Model

Start: The screen displays promotion page when idle. A user clicks the screen to start the order process, the screen will display the menu page.

Categories tab: The menu has several tabs with different categories including “Burgers”, “Drinks”, “Snacks” and so on. Users can click into any category they are interested in to choose a specific product.

Food in the menu: In the menu page, customers can click the picture of a food to select it.

Customize order tab: For each food, after a customer chose the food and before he/she adds the food to shopping cart, he/she can click the "Customize order" button to customize his/her order. For instance, choose “No onions” for the burger, “No ice” for Coke, “grill” for the chicken and so on.

Payment: Customers can click “check-out” button to make payment for his/her order. Customers will be able to choose one of the payment methods including cash, credit/debit card and apple pay in the payment method.

Card reader/Cash reader: Card reader and cash reader are embedded in the machine. Customers can insert card or cash to make payments.

Help: Help button will send a message to the staff in the restaurant, so they can come to help the customer

Back button: Customers can click back button to go back to the previous level page. For example if a customer clicks “Back” button in the “Burger” category page, the page will be directed to the main menu.

Cancel: Customers can click the “Cancel” button to cancel the transaction. The screen will show the promotions again.


Settings: Customers can click the “Setting” button to modify the font size and brightness of the screen.

Documentation

Welcome to the most fastest and easiest Self-Order Kiosk!

The most user-friendly interactive Kiosk brings sweeping transforming in fast food industry across the country. The kiosk requires only simple tabbing on the screen and assists user with food ordering in just few minutes!

There are some interesting functions listed below:

Function Name	Function Description
Order	The menu page has two sections. One section is the list of food categories, e.g. burgers and combos. By tapping the categories, the whole collection of this category will be showed on the screen. Another section is the promotion section that display the new products of random category.
Customize Menu 	After user selected the item, the Kiosk will move to a customize your menu page. Basically, there are two sections in this page: one is the allergy alert options where users can tap on the food icon that they are allergic. The food preference section allows users to customize their taste. User can tap the individual food icon that they need more or less in their picked item. The single tap will lead the user to next Tasty Upgrade Page. The third option is to tap default icon which will set the chosen item in default ingredient setting.
Tasty Upgrade	On this page, users can add or delete the specific ingredient they have chose on the previous page. For example, user can add more onion or less cheese.
Check Out	On the top part of the page allows user to choose to eat in or take out. Another part of the page provides the payment method for the user to choose. These payment methods include credit card, cash, apple pay and etc.

Function Name	Function Description
Customize Setting	All the pages have a “setting icon” on the top left corner of the page. If user tap the setting icon, the setting page will pop up and allows the user to adjust the volume, brightness, font size of the Kiosk Display and the languages.

reference: <https://www.behance.net/gallery/70088181/CookEatRepeat-Identity-and-Branding>. <https://www.behance.net/gallery/70088181/CookEatRepeat-Identity-and-Branding>

Ultimate Guideline to Fast Food Kiosk

Goal:

The guideline assists our team shape design decisions to create a more user-friendly interface. It also provides advices for the design principles against the error, warning, and additional information.

Design principles:

4. Consistency

Our kiosk system provides easy-to-use interface with well-known icons, standard text style, features and uniform terminology. This user-friendly interface minimize the learning time for user and assist user get familiar with our system in a short time.

5. Direct manipulation

User is able to change the content of the screen by tabbing the icon they prefer. After the action, user can immediately see their options on the screen with more details.

6. User Control

Our kiosk system offers user with direct access to the task on every page. User can adjust their options and choose to proceed or cancel the commands at any time. The navigational options provided at every page allows user to control the progress during the order.

4. Configuration

Different font size, color and icons will be displayed on the screen to draw user's attention to errors, warnings or other additional informations.

Specific Guideline:

1. Consistency

- Function consistency: All of the features(e.g. next page icon, shopping bag icon, and setting icon) work similarly during the ordering procedure.
- Visual consistency: The font size, text size, and same icons are consistent on each page.

2. Direct Manipulation

Once user tap the food category they would like to choose on the menu page, all of the items in this category will be displayed on the screen.

3. User Control

If user would like to customize the product with specific ingredient, user can tap the “customize my item” icon and proceed to another page with all the ingredients that can be adjusted. Once user done with the action or the user would like to quit, just tap the “back” icon to go back to the previous page.

4. Configuration

• Errors:

When user try to add 0 item into the shopping bag, there will be a pop-up window in grey color displayed on the screen to let user know this quantity is invalid, please choose another quantity.

• New Products:

There will be a blue ribbon on the left top of the new product’s image, which will draw user’s attention to the latest items.

• Additional information:

If move the mouse to one item, there will be a bubble icon showed on the top right of the item image which tells the user the fat, sodium contents and calories of this specific product.

Task-Command Analysis

The Keystroke-Level Model (KLM) predicts task execution time from a specified design and specific task scenario.¹ The keystroke-level action includes pressing keys, moving mouse, pressing buttons, and so on.² The fast-food kiosk interface we design is to be implemented on a machine with touch screen and does not require an actual keyboard or mouse. However, some screen-touch actions are analogous to keystroke-level actions, for example, pressing the item on the screen is similar to pressing a key on the keyboard (K), which requires moving a finger to the correct position(keystroke) to press.

In this analysis, we assume that tabbing the screen is K operator, moving the hand to the point on the screen is P operator, reaching out to the physical button is H operator, and the M operator for touch screen operation is the same as that for keystroke-level model.

I. Order Feature

A. Scenario 1:

Tiffany is a 28 years old ordering food on the kiosk. Her favorite combination is a burger, fries and coke. She clicks into the “Burgers” category on the kiosk, chooses the burger she wants; jumps to the “Snacks” page, adds a cheese fries into her shopping cart, and then go to the “Drinks” category and adds a Coke.

1. Action sequence

- 1) Find the “Burgers” category button on the screen **M**
- 2) Move a finger to the button **P**
- 3) Tap the button **K**
- 4) Move a finger to the item she wants **P**
- 5) Tap the burger she wants **K**
- 6) Find the “Snack” category button on the screen **M**

¹ Kieras, David. “Using the Keystroke-Level Model to Estimate Execution Times”. p. 1.

² Id.

- 7) Move a finger to the button **P**
- 8) Tap the button **K**
- 9) Move a finger to the item she wants **P**
- 10) Tap the cheese fries **K**
- 11) Find the “Drinks” category button on the screen **M**
- 12) Move a finger to the button **P**
- 13) Tap the button **K**
- 14) Move a finger to the item she wants **P**
- 15) Tap the coke **K**

Total time = 3**M** + 6**P** + 6**K** = 3*1.2 + 6*1.1 + 6* 0.28 = 11.88 sec

2. Analysis

Tiffany is an experienced user. She has her favorite combo, and she knows how to use the machine. To reduce the time required by the actions, we can reduce the mental actions. For example, add a “Combo” category, and automatically direct the user to “Snacks” and “Drinks” categories after the previous was selected. Therefore, the revised action sequence is:

- 1) Find the “Combo” category button on the screen **M**
- 2) Move a finger to the button **P**
- 3) Tap the button **K**
- 4) Move a finger to the burger she wants **P**
- 5) Tap the burger she wants **K**
- 6) Move a finger to the snack she wants **P**
- 7) Tap the cheese fries **K**
- 8) Move a finger to the item she wants **P**
- 9) Tap the coke **K**

Now the total time is reduced to $M + 4P + 4K = 1.2 + 4*1.1 + 4* 0.28 = 6.72$ sec

B. Scenario 2:

John is an 8 years old boy choosing what he wants to eat on a kiosk. A regular combo is too much for John to finish. He sees the kid's meal's picture on the menu. The yummy Mac and Cheese, fries and strawberry flavored yogurt looks very attractive to him. He clicks the picture and a kid's combo is added to their order.

1. Action sequence

- 1) Check the varies food categories that he thinks attractive **M**
- 2) Find the "kid's meal" category button on the screen **M**
- 3) Move a finger to the button **P**
- 4) Tap the button **K**
- 5) Find the food combo he likes **M**
- 6) Move a finger to the item he wants **P**
- 7) Tap the combo he wants **K**

Total time = $3M + 2P + 2K = 3*1.2 + 2*1.1 + 2*0.28 = 6.36$ sec

2. Analysis

Kids are more likely to be interested in the beautiful picture of food that seems delicious to them. Therefore, our fast-food kiosk should have a section that design specifically for kids. For example, on the home screen there should be a button "kids" that direct the user to certain page.

C. Scenario 3:

Andrew is a vegetarian. He steps into a fast food restaurant and wants to order some food he can eat. There is numerous food on the menu, but with the vegetarian label on the menu on veggie friendly dishes, it is easy for him to know what he can order.

1. Action sequence

We assume that Andrew wants to order an entry, a side, and a drink.

- 1) Find the “Vegetarian food” category button on the screen **M**
- 2) Move a finger to the button **P**
- 3) Tap the button **K**
- 4) Find the entrée he likes **M**
- 5) Move a finger to the item he wants **P**
- 6) Tap the food he wants **K**
- 7) Find the side he likes **M**
- 8) Move a finger to the item he wants **P**
- 9) Tap the food he wants **K**
- 10) Find the “Drinks” category on the screen **M**
- 11) Find the drink he likes **M**
- 12) Move a finger to the item he wants **P**
- 13) Tap the drink **K**

$$\text{Total time} = 5\mathbf{M} + 4\mathbf{P} + 4\mathbf{K} = 5*1.2 + 4*1.1 + 4*0.28 = 11.52 \text{ sec}$$

2. Analysis

Andrew may not be very familiar with the food the restaurant provided. Therefore, it is good that we provide a “Vegetarian food” category. We may also count the most popular vegetarian food people ordered, and list it on the top of the screen, so we can reduce the mental actions required.

II. Promotion Features

A. Scenario 1:

Alex is a 25 years old software engineer works for a famous and busy IT company. She is always busy with her project, so she has no idea what to eat. She clicks on the “Recommendation” button on the homepage to see the recommendations from the shop and orders the combo from the promotion.

1. Action sequence

- 1) Check the varies food categories **M**
- 2) Find the “Recommendation” category button on the screen **M**
- 3) Move a finger to the button **P**
- 4) Tap the button **K**
- 5) Browse the recommended combo and decide what she likes **M**
- 6) Move a finger to the combo she wants **P**
- 7) Tap the combo she wants **K**

$$\text{Total time} = 3\mathbf{M} + 2\mathbf{P} + 2\mathbf{K} = 3*1.2 + 2*1.1 + 2*0.28 = 6.36 \text{ sec}$$

2. Analysis

This is a good opportunity for the restaurants to promote its products. To help the busy user choose the right food, this section must be carefully design, so that they do not need to think too much. We can also add feature tags under the product, for example, “vegetarian”, “meat-lover”.

B. Scenario 2:

Chris is a 60 years old truck driver who's quite forgetful. He ordered chicken nuggets and fries before making the payment. The promotion page before the payment page recommends him some drinks. He adds a diet coke into his cart.

1. Action sequence

- 1) Find the “Recommendation” category button on the screen **M**
- 2) Move a finger to the button **P**
- 3) Tap the button **K**
- 4) Browse the recommended food and decide what he likes **M**
- 5) Move a finger to the drink he wants **P**
- 6) Tap the food he wants **K**

$$\text{Total time} = 2\mathbf{M} + 2\mathbf{P} + 2\mathbf{K} = 2*1.2 + 2*1.1 + 2*0.28 = 5.16 \text{ sec}$$

2. Analysis

Our system should make recommendations based on the food the user has already chosen. For example, in Chris's case, we should list recommended drinks on top of the screen to reduce the browsing time in step 2.

C. Scenario 3:

Hailey is an 18 years old university student who uses the kiosk to buy herself lunch. After she chooses her food, she sees the popular combo from the recommendation page before making the payment. She decides to buy another popular combo for her boyfriend. So, Hailey adds the combo into the cart.

1. Action sequence

- 1) Find the "Recommendation" category button on the screen **M**
- 2) Move a finger to the button **P**
- 3) Tap the button **K**
- 4) Browse the recommended food and decide what she likes **M**
- 5) Move a finger to the combo she wants **P**
- 6) Tap the food she wants **K**

$$\text{Total time} = 2\mathbf{M} + 2\mathbf{P} + 2\mathbf{K} = 2*1.2 + 2*1.1 + 2*0.28 = 5.16 \text{ sec}$$

2. Analysis

This is a good opportunity for the restaurants to promote its products. If the user has already chosen a full meal set, the restaurant should display its new products that may attract the user. Our system should learn the user's choice and provide food with similar "feature tags."

III. Machine Settings Feature

A. Scenario 1:

Jonathan decides to use the fast-food kiosk in sunny day. The light in the room makes him barely able to read the words on the screen. So, he clicks on the setting button (which is quite bold) and increases the brightness of the screen to see everything clear.

1. Action sequence

- 1) Find the “Setting” button on the screen **M**
- 2) Move a finger to the button **P**
- 3) Tap the button **K**
- 4) Find the “Brightness” button on the screen **M**
- 5) Move a finger to the button **P**
- 6) Tap the button **K**
- 7) Move a finger to the button **P**
- 8) Tap the “+/-” button multiple times to adjust the screen to proper brightness. **K (or nK)**

$$\text{Total time} = 2\mathbf{M} + 3\mathbf{P} + 3\mathbf{K} = 2*1.2 + 3*1.1 + 3*0.28 = 6.54 \text{ sec}$$

2. Analysis

Our kiosk can install a light sensor that can help to automatically change the brightness of the screen. There could also be a floating action button on the screen to show the common settings, for example brightness, zoom in/out. Therefore, the mental actions, finger moving actions, and tabbing actions can be reduced.

B. Scenario 2:

Jay is a 80 years old closet maker and he cannot read words on screen with normal font size. When he uses the kiosk, he clicks the doozy setting button and enlarges the font size to start his order.

1. Action sequence

- 1) Find the “Setting” button on the screen **M**
- 2) Move a finger to the button **P**
- 3) Tap the button **K**
- 4) Find the “Zoom in/out” button on the screen **M**

- 5) Move a finger to the button **P**
- 6) Tap the button **K**
- 7) Move a finger to the button **P**
- 8) Tap the “+/-” button multiple times to adjust the word to proper scale. **K**
(or **nK**)

$$\text{Total time} = 2\mathbf{M} + 3\mathbf{P} + 3\mathbf{K} = 2*1.2 + 3*1.1 + 3*0.28 = 6.54 \text{ sec}$$

2. Analysis

Our kiosk can install a light sensor that can help to automatically change the brightness of the screen. There could also be a floating action button on the screen to show the common settings, for example brightness, zoom in/out. Therefore, the mental actions, finger moving actions, and tabbing actions can be reduced.

C. Scenario 3:

Jones is a 10 years old boy whose height is 5.0 ft. The physical design of the kiosk is friendly to children because the users can change the height of the machine. Jones adjusts the machine to his height and orders the food he wants.

1. Action sequence

- 1) Find the buttons to control the height of the machine on the kiosk **M**
- 2) Reach out to the button (Up or Down) **H**
- 3) Press the button **K**

$$\text{Total time} = \mathbf{M} + \mathbf{H} + \mathbf{K} = 1.2 + 0.4 + 0.28 = 1.88 \text{ sec}$$

2. Analysis

To help its user to change the machine to the proper position, the buttons should be obvious to average user. Therefore, the time to find the button can be reduced.