

Introduction

The experience of Fast-food dining may soon become as simple as using the ATM. A particular Carl's Jr. Restaurant's agreement to test pilot a new interactive interface that allows customers to directly place and modify their orders without the middleman promises both speed and efficiency. Two of these kiosks are situated in the front of the restaurant near

the cash registers. Animated graphics dance across the monitor beckoning customers to place their orders using its touch screen capabilities (see *Fig. 1*). Users are given the option to choose a language of preference either in English or Spanish before they begin their order. Audio feedback is projected from two speakers above the monitor that further assists users in completing their order. The menu display consists of icons that depict



Fig. 1: The full display of the kiosk machine.

specific items and categories which help users navigate and make their selections. A sidebar menu allows users to see the items they've selected, gives them the ability to modify their selection, and also calculates the total price of their current order. A single credit card processor located below the monitor confines users to pay with a credit/ATM card and the receipt dispenser just below it prints out the completed transaction between the kiosk and the user. Patrons entering this restaurant expect quick service, thus the kiosk makes contextual sense in the Carl's Jr. environment. The kiosk is designed to make this fast food experience even faster than what users are accustomed to, promising faster customer turn-over and even allowing the restaurant to handle a higher volume of users. Although the kiosk is designed to better accommodate all customers that come to the restaurant, a

pattern profile of users and knowledge level emerges from their interaction with the kiosk varying their total time of ordering, receiving food and whatnot. For the purpose of this study, our main focus is with how people interact with the graphical presentation and organization of the display and the payment method.

Procedure

We went to Carl's Jr. Restaurant and observed and interviewed customers as they placed their order at the kiosk. We asked questions such as, "How often do you come to Carl's Jr.?" and "Have you used this kiosk or something similar to it?" to determine their familiarity with the menu items and the kiosk. We also asked questions concerning the design and usability of this interface. For a general list of our questions, please refer to Appendix A.

Data Discussion

We interviewed fourteen subjects between the ages of 17 and 42. Interestingly, all of the subjects we interviewed were male and virtually all of the people we observed interacting with the kiosk were also male. Of the fourteen subjects that we interviewed, nine have a technical or engineering background. For example, two subjects informed us that they are computer science majors and one subject revealed he is a network engineer. On average most of the users that we interviewed have used it before or on a regular basis, showing a breadth familiarity to the machine, however, two of the users we interviewed were unfamiliar with the kiosk, it being their first time to use it.

1 The touch-screen experience was an important feature for most of the customers that

we interviewed. One customer said that this was what initially brought his attention to the kiosk and he also “assumed it was easy [to use] because it was touch screen.” The touch screen endowed him with the ability to directly manipulate his order by physically placing his finger on what he wanted. This design is more appropriate for this fast-paced environment as opposed to a command line interface which would take more time to type in the order, or a drop down menu that forces him to serially search through a list of text options. However the touch screen is not without fault. Several customers noted that occasionally they would face the problem that the screen had to be pressed more than once in order to receive the command. This behavior is caused by a lack of visual and/or physical feedback from the touch screen. For instance one subject exclaimed in distress “I can’t tell if I pressed it...it’s not doing anything!” Though for most customers, the delay time between touching the screen and the feedback from the interface was virtually nonexistent. Surprisingly, ¼ of our subjects brought to our attention that they’ve experienced a communication barrier which results in erroneous customer orders. This miscommunication happens because the interaction between the customer and the cashier is of a second degree order, meaning that the order must first go through the cashier before entering the kitchen. The touch screen eliminates this problem since the order from the customer is directly transferred to the kitchen, without any loss of information from the middleman. The ease of use and familiarity that customers previously had with touch screens overall added to the sense that the customer is “in control of their ordering experience.”

In general, most customers who used the kiosk found the graphical interface easy to use. A customer remarked that the graphics were “easy to understand and are pretty much intuitive.” The icons’ resemblance to the actual menu items and categories directly map the

items with its representation (see Fig. 2). This consistent feature was enjoyed by the



Fig. 2: The “Full Menu” of the kiosk machine.

subjects. Although the icons depict a specific menu item, for example a “Western Bacon Cheeseburger” most of the subjects said they could not differentiate between the burgers by only looking at the icon and must resort to reading the icon label. But they all agreed that the icons are important for retaining the overall aesthetic properties of the display. The subjects

reported that the organization of the menu display was helpful and easy to navigate. Looking at a single aspect of the menu display, the “Back-up” and “Start-Over” buttons are present on

the lower right corner of virtually every display as a mechanism for preventing errors (see Fig. 3). However, we did not notice the subjects using these options often. During one observation, we noticed a subject press on the wrong icon. After realizing this, he searched



Fig. 3: The navigation buttons that are present on virtually every screen.

the screen for a few moments before he found the “Start-Over” button to repair his mistake. When asked why he chose the “Start-Over” rather than the “Back-Up” option, the subject replied that he did not see that function. He suggested that these buttons should be made more salient because of their important error prevention features. He gave further suggestions that they should be made a different color or placed near the top of the display because culturally, we are accustomed to looking for editing tools near the top of most

computer software. By inputting the whole menu into the kiosk, there is a tradeoff from seeing the entire menu to only being able to see parts of the menu at a time. Most subjects said that this didn't bother them because they already knew what they wanted to order, and they were also familiar with the system so it was easy to navigate there.

The users liked the modification sidebar menu because it lets them view and modify their order. Most subjects expressed their satisfaction with the menu's ability to help reduce their short term memory load. The sidebar menu displays current selections and the total price, so users can see their order at a glance, thus reducing cognitive load (see *Fig. 4*). Users made modifications to their order by touching the "modify" button seen on the bottom of the screen. Some modifications to orders include: changing or adding the side orders, upgrading orders to a combo, or substituting fries for other offered sides. One first time user noted that he was not aware that he had the option of making modifications to his burger, stating that, "the 'modify' button is not prominent enough because it's too small and towards the bottom of the screen." This depicts how novices are not aware of the full functions of this system. Since they do not have the time



Fig. 4: The modification sidebar menu in its minimized form, depicting the user's current order and total.

for exploring the functionality of the kiosk such as the "modify" button and knowing its functions, it is often overlooked. In general, most of the users we interviewed have used the machine before and were able to navigate quickly through it based on previous usage and retained knowledge.

The payment method constrains the user to pay with a credit or ATM card. Thus it does not cater to universal usability (Schneiderman's second rule). Most users informed us that the kiosk used to take cash and many were disappointed because the system no longer met their expectations. We noticed that some people approached the machine but left after they realized that it only takes credit cards. One of the users even said, "More people would probably use it if it took cash." In addition, we noticed that a few of the users had problems with the credit card processor. A third of our subjects had to slide their card through more than once before the system could read it and a fourth even tried to slide different credit cards through before eventually abandoning their order and reordering at the register. In one instance, a customer successfully used his credit card at the register after multiple failed attempts at the kiosk. Despite these flaws in the credit card process, the credit card allows for a quick transaction since there is no need for monetary exchange. Although the payment method fails to meet universal usability, the design dialogues help to prevent errors. The design dialogues give feedback concerning the status of the credit card transaction. For example, if a problem occurs during the processing of the credit card, a dialogue will prompt the user to try a different payment method.

Conclusions

In conclusion most of the users of this interface were very satisfied. This is no surprise since this product fulfills most of Shneiderman's eight golden rules of interface design. Consistency is found throughout the graphical organization of the interface. Unfortunately, it does not cater to universal usability because of its limited payment methods. Informative feedback is offered through graphical, physical and audio outputs. Design

dialogs such as the graphical receipt yields closure. Options such as the “Back-Up” and “Start-Over” buttons help prevent errors and allow users to easily reverse their actions. The touch screen capabilities offer users with the notion that they are in control, and features such as the modification sidebar menu reduces short-term memory load. Despite the praises the interface received by its users, we noticed that most customers entering the restaurant preferred ordering at the register rather than at the kiosk. We also noticed them eyeing the kiosks while they waited in line to place their order, so it is safe to say they are aware of the kiosk and its function. Although, this interface complies with most of Shneiderman’s eight golden rules of interface design, it may take a bit of time to gain the consumers’ trust.