

GROUP ONE RESEARCH REPORT

Usability Study of the Dominick's Self-Service Checkout Kiosk

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INTRODUCTION

In this report, we will discuss the results our usability study of Dominick's self-service checkout kiosks. This introduction will present the research issues, summarize the logistical details of the study, and provide an overview of the sections of this report.

Although self-service kiosks have been in use at Dominick's store locations for several years, users still experience difficulty with the interface and encounter usability issues which may cause them to avoid using the kiosks. Our initial investigation into Dominick's self-service kiosks provided two research themes which we developed to shape and limit the scope of our study:

- What usability dimensions and perceptions influence a user in his or her decision to utilize a self-service kiosk over a traditional checkout lane when checking out at a Dominick's store?
- How might we improve the self-service kiosk to increase usability?

Based on these themes, our research team planned and conducted a usability study which took place between the dates of 1 September 2010 and 24 November 2010 as part of COM 525, *Usability Testing and Evaluation*, taught by Dr. Libby Hemphill at the Illinois Institute of Technology, Chicago. This report summarizes and analyzes survey responses from 70 Dominick's customers, five of whom were observed using the kiosk and immediately interviewed about their experiences. Additionally, this report includes a competitive analysis of self-service shopping kiosks at five Chicago area retail store chains. The study was unfunded, except for the donation of an incentive by Dr. Hemphill awarded at random in order to increase participation in the survey.

An executive summary following this section outlines the major findings of our study. Our report is organized by usability research method, with each section containing an introduction to our approach, a discussion of our methodology, our results, and a discussion of those results coupled with our recommendations specific to that research method. We will discuss other research methods which we considered conducting and explain why we chose to ultimately reject them. Finally, this report concludes with a summary of recommendations for redesign and a summary redesign plan.

EXECUTIVE SUMMARY

This report outlines the research methods used in our semester-long study of Dominick's self-service checkout kiosks as well as the results and recommendations generated by these methods. These research methods are:

1. A survey gathering customer preferences and demographic information
2. Observations of individual Dominick's shoppers
3. Interviews with those same shoppers
4. A competitive analysis of four stores using similar checkout kiosk systems

Throughout this user experience study, our main goal has been to improve the usability of Dominick's kiosks such that customer satisfaction and frequency of use increase. We first administered a survey to acquaintances via email and Facebook to gauge the satisfaction and frequency of use of Dominick's customers and to determine their preferences. We determined the mean satisfaction of survey respondents on a 5-point Likert scale to be 3.68 with a standard deviation of 0.96. Also, we determined frequency of use to correlate with user satisfaction ($p \leq 0.05$). Other key findings include positive correlations between frequency of use and mean ease of use across all function categories ($p \leq 0.05$) and between shopping frequency and satisfaction ($p \leq 0.05$), as well as an inverse correlation between amount spent per shopping trip and frequency of use ($p \leq 0.05$).

We conducted observations in order to identify specific mistakes and confusion on the part of the users and to assess their emotions while using the self-service checkout kiosks. This research method helped us to observe how people actually use Dominick's kiosks and to evaluate how satisfied users are with the operation of the Dominick's self-service checkout kiosk. We created an observation guide based on four core areas of the shoppers' user experience:

1. Start Up
2. Scanning
3. Bagging
4. Paying

While the majority of observed shoppers did not encounter any errors, those that did were immediately assisted by the kiosk attendants. We interpret this as a concerted effort by Dominick's to support automated kiosk users.

We also conducted a series of five interviews with these same shoppers to further assess, qualitatively, how users feel about the self-service checkout process. The interview guide we created was based on the same four core areas of the shopping experience used for the observation guide. Although interviewees voiced their frustrations with the Dominick's kiosks, their response to the general functionality of the kiosks was overwhelmingly positive. Aesthetic concerns were also voiced by several interviewees, and along with the insights provided by the problems and frustrations they shared with us, formed the basis of the recommendations from this method.

We also conducted a competitive analysis of four stores using similar checkout kiosks systems. These stores were:

- Strack and Van Til
- Jewel-Osco
- Meijer
- Home Depot

We took notes on the pros and cons of each store with respect to the following eight areas:

1. Start Screen
2. Scale Surface
3. Checking Out
4. Discount Card
5. Payment System
6. Errors
7. Help
8. Languages

These notes were placed in a spreadsheet which served as the basis for the recommendations resulting from our competitive analyses.

We conclude this report with a list of all recommendations generated through analysis of the aforementioned methods to the Dominick's team for improving the usability of their self-service checkout kiosks. We hope that by implementing some or all of these recommendations, the Dominick's team can increase the satisfaction of Dominick's customers and the frequency with which they use Dominick's kiosks.

METHODS

This section outlines the key findings for each of our research methods: the survey, observation, interviews, and competitive analysis. In addition, we also discuss the research methods we rejected as well as other methods that we believe could be implemented to expand Dominick's user research for a real world implementation.

SURVEY

INTRODUCTION

In order to address a subset of our research questions, we fielded a survey targeted at users of the Dominick's self-service checkout kiosk which was designed to gauge user perception of the system and collect demographic information from our target audience. Despite some shortcomings in the design of the survey, we were able to extract useful information that impacted our suggestions for redesigning the self-service kiosks.

METHODOLOGY

For this survey, we solicited about 250 people by email and received 70 valid responses. This corresponds to a response rate of 28.4%, which is significantly greater than our estimated response rate of 10%. We also posted the survey on Facebook but there is no way to estimate how many people responded based on an email invitation versus how many people responded through linking to the survey from our individual Facebook profiles. There is some measure of selection bias since the survey was distributed only to acquaintances.

Ease of use was rated on a four point Likert scale for each feature that we determined users would most frequently encounter when using a kiosk (in our own estimation, and based on results of a pilot study). Comparing each individual response to other results would require more sophisticated statistical methods, an issue that will be further discussed later in this report. In order to have numbers with which to make comparisons, we found the mean ease of use value for each category, and the mean ease of use value for all users across all categories. The mean ease of use value for each category is displayed below in table 1 and graphically in figure 2 in the order in which the items appeared in our survey. The mean ease of use value for each user across categories was used for questions that compare ease of use to other user dimensions.

FINDINGS

The primary indicator of overall satisfaction was a five point Likert scale (5=very satisfied), which returned a mean satisfaction rating of 3.68 (standard deviation=0.96, mode=4). The distribution is represented graphically in Figure 1.

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Comparing each individual response to other results would require more sophisticated statistical

methods, an issue that will be further discussed later in this report. In order to have numbers with which to make comparisons, we found the mean ease of use value for each category, and the mean ease of use value for all users across all categories. The mean ease of use value for each category is displayed below in Table 1 and graphically in Figure 2. The mean ease of use value for each user across categories was used for questions that compare ease of use to other user dimensions.

Users were asked to report reasons why they did not use the self-service kiosk if they responded that they did not use the kiosk every time they shopped at Dominick's. The most common reason for users not using the kiosk was having too many items, followed by the lines being too long. The full results can be found in Table 2.

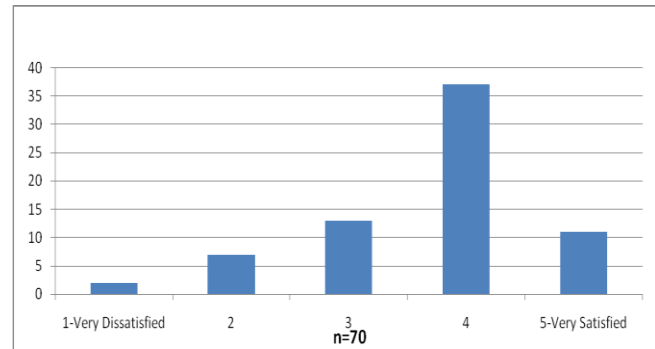


Figure 1: Distribution of satisfaction ratings

Ease of Use (responses on a 4 point Likert scale)	n	mean	standard deviation	median	mode
Getting started	70	3.83	0.42	4	4
Scanning items with UPC codes	68	3.75	0.50	4	4
Searching product codes for produce and other items without barcodes	62	2.90	0.82	3	3
Weighing produce or other by-the-pound products	62	3.21	0.85	3	4
Paying with credit or debit card	68	3.84	0.41	4	4
Paying with cash	43	3.70	0.51	4	4
Paying with check	4	2.50	0.58	2.5	3
Paying with another payment method	6	3.67	0.52	4	4
Bagging your groceries	68	3.34	0.80	4	4
Receiving change or cash back	45	3.84	0.37	4	4
Entering coupons	24	3.29	0.91	4	4
Purchasing liquor, tobacco, or other age-restricted sale items	25	2.84	0.85	3	3

Table 1: Ease of use by category; shading is for visibility purposes only.

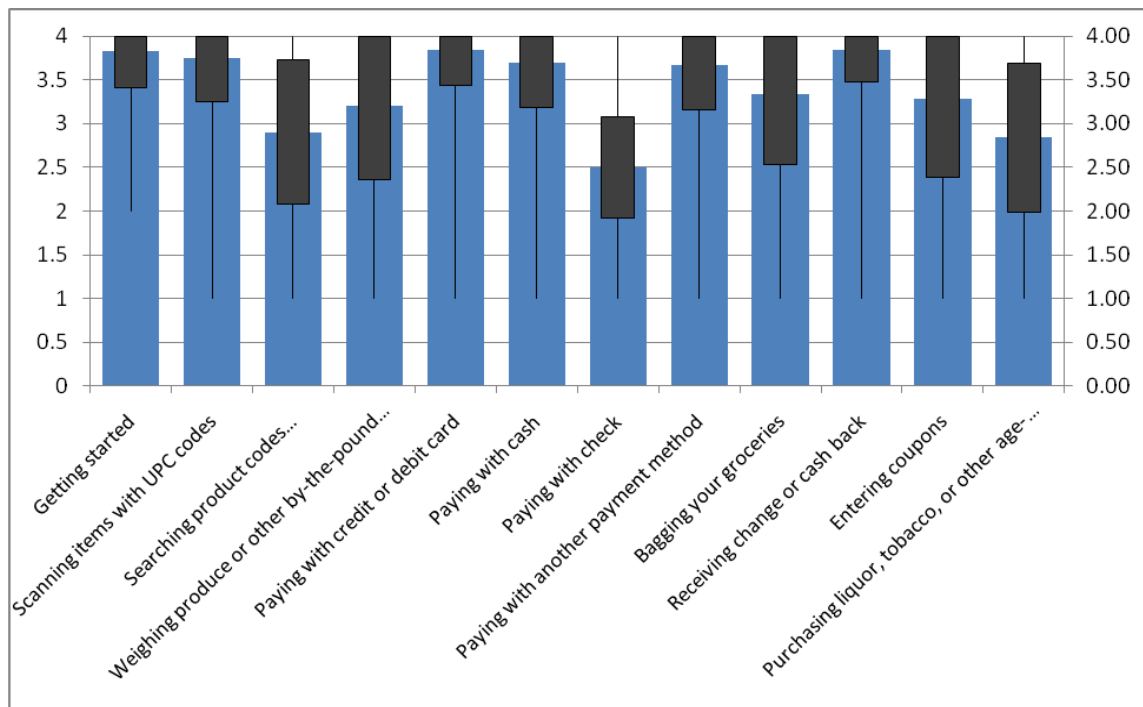


Figure 2: A histogram of mean ease of use values with range (thin lines) and standard deviation (solid boxes). Possible responses for users were whole numbers 1-4 (there was no response analogous to zero; users could opt out of rating a feature they had never used).

User Response	n
I have too many items	38
The line at the self-service checkout kiosk is too long.	24
Other	12
I have an age-restricted sale item such as liquor or tobacco	8
I don't have my Dominick's Fresh Values card with me	7
I plan to use coupons	2

Table 2: Reasons users reported for not using the self-service kiosk; shading is for visibility purposes only.

RESEARCH QUESTIONS

This section will present statistics that attempt to answer the questions raised during the design of the survey. A summary description on the left of the page describes the significance of the statistical results on the right. A detailed discussion of these statistics follows in the Analysis/Recommendations section.

DOES FREQUENCY OF USE CORRELATE WITH SATISFACTION?

A correlation of the frequency with which a shopper uses the kiosk (every time, sometimes, rarely) and the customer's associated satisfaction rating shows a positive correlation.	correlation coefficient	0.390
	degrees of freedom	68
	critical value	0.232
	significant?	Yes

DOES FREQUENCY OF USE CORRELATE WITH MEAN PERCEIVED EASE OF USE (FOR EACH USER ACROSS ALL FEATURES)?

A correlation of the frequency with which a shopper uses the kiosk (every time, sometimes, rarely) and the shopper's mean perceived ease of use across all categories of use shows a positive correlation.	correlation coefficient	0.530
	degrees of freedom	68
	critical value	0.232
	significant?	Yes

DOES PERCEIVED EASE OF USE IMPACT HOW FREQUENTLY CUSTOMERS USE THE SELF-SERVICE KIOSK?

Frequency of use	n	Mean Ease of Use Rating (across all features)	p values			Significant?
			Rarely	Sometimes	Every time	
Every time	17	3.50	0.165	0.647		No
Sometimes	41	3.56	0.059		0.647	No
Rarely	12	3.23		0.059	0.165	No

Table 3: Results of a t-test to determine whether users grouped by frequency of use have statistically significant differences in mean perceived ease of use (across all categories)

As represented in the above table, the t-tests revealed that differences in mean perceived ease of use across shoppers grouped by frequency of use were not statistically significant.

DOES THE AMOUNT OF TIMES PER WEEK THAT A PERSON SHOPS FOR GROCERIES CORRELATE WITH SATISFACTION?

A positive correlation was established between the amount of times per week that a person shops for groceries and satisfaction.	correlation coefficient	0.251
	degrees of freedom	68
	critical value	0.232
	significant?	Yes

DOES THE AMOUNT OF TIMES PER WEEK THAT A PERSON SHOPS FOR GROCERIES CORRELATE WITH THE MEAN PERCEIVED EASE OF USE?

There is no evidence of a correlation between these two values.	correlation coefficient	0.020
	degrees of freedom	68
	critical value	0.232
	significant?	No

DOES THE NUMBER OF PEOPLE THE USER SHOPS FOR CORRELATE TO THE FREQUENCY OF USE OF SELF-SERVICE KIOSKS?

There is no evidence of a correlation between these two values.	correlation coefficient	-0.071
	degrees of freedom	68
	critical value	0.232
	significant?	No

IS THERE A DIFFERENCE BETWEEN PRIMARY SHOPPERS AND NON-PRIMARY SHOPPERS IN TERMS OF FREQUENCY OF USE?

A t-test of frequency of use results across the primary and non-primary shopper groups revealed that there is no significant difference in how frequently primary and non-primary shoppers use the kiosk.	p	0.251
	significant	No

IS THERE A DIFFERENCE BETWEEN PRIMARY SHOPPERS AND NON-PRIMARY SHOPPERS IN TERMS OF SATISFACTION?

A t-test of overall satisfaction results across the primary and non-primary shopper groups revealed that there is no significant difference in how satisfied primary and non-primary shoppers are with the kiosk.	p	0.251
	significant	No

DOES THE AMOUNT SPENT BY A SHOPPER CORRELATE WITH FREQUENCY OF USE OF THE SELF-SERVICE KIOSK?

An inverse correlation exists between the amount a shopper spends and the frequency with which a shopper uses the kiosk.	correlation coefficient	-0.358
	degrees of freedom	68
	critical value	0.232
	significant?	Yes

DOES THE AMOUNT SPENT BY A SHOPPER CORRELATE WITH SATISFACTION WITH THE SELF-SERVICE KIOSK?

There is no evidence of a correlation between these two values.	correlation coefficient	0.133
	degrees of freedom	68
	critical value	0.232
	significant?	No

DOES THE NUMBER OF FEATURES A SHOPPER REPORTS USING CORRELATE WITH FREQUENCY OF USE OF THE SELF-SERVICE KIOSK?

A correlation exists between number of features used and frequency of use.	correlation coefficient	0.437
	degrees of freedom	68
	critical value	0.232
	significant?	Yes

DOES THE NUMBER OF FEATURES A SHOPPER REPORTS USING CORRELATE WITH SATISFACTION WITH THE SELF-SERVICE KIOSK?

There is no evidence of a correlation between these two values.	correlation coefficient	0.165
	degrees of freedom	68
	critical value	0.232
	significant?	No

ANALYSIS/RECOMMENDATIONS

Our descriptive statistics indicate a need to address shoppers' interaction with the kiosk in the following four areas:

- Searching for UPC codes for non-barcode items
- Purchasing age-restricted items
- Mitigating the perception of having too many items
- Mitigating the perception of long lines.

Customers reported a lower perceived ease of use for searching for UPC codes for non-barcode items and purchasing age-restricted items, as can be discerned from Figure 2 above. Although customers reported difficulty paying by check, a very small subset of users (n=4, or roughly 5% of respondents) reported using this method of payment making it a low priority item. Our prioritization of redesign efforts will be based, in part, on these findings.

A number of customers avoided using the kiosk because they perceived that they had too many items (n=38, 54%) or the lines were too long (n=24, 34%).

Customers who use the self-service checkout kiosks frequently are, on average, more satisfied with the kiosk and also have a higher average perceived ease of use ($p \leq 0.05$, respectively). In terms of how often customers shop for groceries, we see that customers have a higher degree of satisfaction the more often they shop for groceries. There is no data that suggests shoppers who shop for groceries more often also have a higher perceived ease of use rating.

In order to determine if there were differences in the mean overall satisfaction and mean frequency of use between primary shoppers and non-primary shoppers, three t-tests were conducted. The results show that their mean responses are not significantly different.

There was no evidence to suggest a correlation between number of persons shopped for and frequency of use; however, an inverse correlation is evident between the amount a person spends on groceries and the frequency of use. Hence, we can say with confidence that the more a person spends on groceries, the less likely they are to use a self-service kiosk and vice versa ($p \leq 0.05$). No connection was found between the amount spent on groceries and overall user satisfaction.

Finally, we defined 'usage patterns' as the number of features used by each shopper. The number of features used did not correlate with satisfaction but did show a strong correlation with frequency of use. We can say with confidence that there is a connection between the number of features used and the frequency with which shoppers use the self-service kiosk ($p \leq 0.05$).

Based on these results, an area that needs to be addressed in a kiosk redesign is the perception that purchasing too many items is a reason not to use the kiosk. Since the amount a shopper spends on groceries is inversely correlated with frequency of use, it seems likely that users who make large purchases tend to avoid the kiosk.

Frequent users are generally satisfied with the kiosk and think it is easy to use, while persons who infrequently use the kiosk use less features.

It is important to remember when interpreting these results that correlations only show connections between the results and do not demonstrate that one factor influences the other in any way.

SURVEY SHORTCOMINGS

Our survey had two design problems which limited our ability to answer questions proposed during the survey design:

1. We anticipated that how users began using the kiosk (select language, scan item, etc.) would relate to how satisfied they were with the system and what their 'error frequency' was. We allowed users to select multiple starting techniques, which would make several different combinations of results that would have to be compared to one satisfaction value, a problem that needs a more complex statistical analysis than can be provided here. We also did not define 'error frequency' or ask a question that provided a metric (e.g., Out of 10 times using the self-service kiosk, how often do you experience an error?). Determining information about user errors is better left to observation and interview, where the observer/interviewer can be sure that the user understands questions and can code data according to error type (as opposed to relying on the user to translate his or her perceptions into our coding schema).
2. We expected to correlate satisfaction with other kiosks to satisfaction with the Dominick's kiosk, but we allowed users to input their own perceptual responses in the text box and did not limit their choices. Data would have to be coded and then compared in order to answer this question.

OBSERVATION

INTRODUCTION

The purpose of our observation research method was to help us to identify specific mistakes and confusion on the part of the users as well as their emotions while using the self-service checkout kiosks. Our goal was to learn how people actually use the kiosks and this research method was useful in evaluating how satisfied users are with the operation of the Dominick's self-service checkout kiosk. By observing their emotions while using the system, we hoped to be able to obtain some clues to their level of satisfaction while using the system during observations.

METHODOLOGY

We used Nielsen's usability recruitment metrics to recruit five observation participants from our survey population. We observed these shoppers of varying abilities, backgrounds and interest levels as they used the automated checkout system. We watched how they started the system, what functions they used, what problems they encountered and how they solved them.

We developed an observation guide to help observers look at how Dominick's automated checkout customers perform four discrete actions:

1. Start up
2. Scanning
3. Bagging
4. Paying

Our instructions for observers were based on *User Experience Remastered: Your Guide to Getting the Right Design*, Chapter 10, "Usability Tests," (Kuniavsky) and Rubin and Chisnell, *Handbook of Usability Testing, Second Edition*. We included pointers for the observers, listing the types of behaviors they should look for and how to conduct the observation. Observation subjects were told that they should simply checkout as they normally would if the observer was not present.

In addition we developed forms so that observers could record their impressions of how the observed shopper accomplished the automated checkout procedure. Observers could easily code and check off key steps in the checkout procedure and note any errors the shopper made as well as the shopper's emotions during each step of the checkout procedure. We also asked each observer to record their impressions of how their observed shopper performed on a debriefing form after the observation.

All shoppers were observed in Chicago and suburban Dominick's between 6 and 9 November 2010. Each shopper used the Dominick's automated checkout kiosk which looks like Figure 3 below.



Figure 3: Dominick's Automated Checkout Kiosk

FINDINGS

Table 4 below shows each of the four tasks performed by each observed shopper as well as any errors they encountered and how they were resolved.

Shopper	Tasks		Errors	Notes
1	Start Up	Language		The shopper never entered a loyalty club card
	Scanning	Just scanned		The shopper only scanned items; no weighing or look-ups
	Bagging	Regular bagging		
	Payment	Credit/Debit – debit card		
2	Start Up	Scanned		The shopper never entered a loyalty club card no.
	Scanning	Scanned		The shopper only scanned items; no weighing or look-ups
	Bagging	No bagging		Note that no errors were encountered during this 'no bagging'
	Payment	Cash		
3	Start Up	Language		Shopper immediately went to PIN-pad and keyed in her phone number to activate her store loyalty card
	Scanning	Scanned Weighed Looked up codes		Shopper separated her order into 2 parts – those which had to be scanned only and those which had to be weighed or their code had to be looked up and quantity entered, such as muffins from the bakery
	Bagging	Regular bagging		
	Payment	Credit/Debit – credit card		
4	Start Up	Language		
	Scanning	Scanned Weighed Looked up codes	User hesitated with first produce item to look up code; employee shouted out the bananas code no.	Same employee also shouted out the tomatoes code before shopper had a chance to do anything; not technically errors but assistance given by employee in anticipation of errors
	Bagging	Regular bagging	'An item was removed from the bagging area' error	Error resolved by employee who cleared the error on the system
	Payment	Credit/Debit – credit card	User hesitated at pin pad screen which was noticed by employee. User asked employee how to pay	Employee told her to cancel. Not necessarily an error but assistance given by the employee who had already interacted several times with this shopper

			with credit.	during checkout.
5	Start Up	Language		
	Scanning	Scanned Weighed Scanned age restricted item		Shopper had to show ID to attendant for liquor purchase.
	Bagging	Regular bagging No bagging		Shopper inadvertently pressed skip bagging for one item but did not encounter an error; she simply placed produce in a bag, slipped it around her arm and kept scanning.
	Payment	Credit/debit – debit card.		Shopper forgot store loyalty card; asked observer for his.

Table 4: Dominick's Automated Checkout Kiosk Observation Data Break Down

ANALYSIS AND RECOMMENDATIONS

Our observations can be summarized as follows:

1. The majority of our observed shoppers did not encounter errors.
2. When errors were committed or when help was necessary (such as checking an ID for a liquor purchase), the automated kiosk attendant quickly serviced our observed shopper, even to the point of anticipating that an observed shopper would need a code number for a produce item and shouting it out from her station. We interpret this as a concerted effort by Dominick's to support automated kiosk users.

This method of user research yielded no recommendations.

INTERVIEWS

INTRODUCTION

We conducted a series of five interviews of users of the Dominick's self-service kiosks to gather largely qualitative data; in other words, data concerning how users feel about the self-service checkout process. We were looking for specific customer experiences to guide our usability goals of increasing customer satisfaction and frequency of use of the kiosks.

METHODOLOGY

Since we seek to improve the kiosks, we were mainly interested in letting interviewees voice their frustrations with the current system. However, we also recognized that allowing customers to speak about aspects of the self-service checkout kiosk they really like (if they expressed an interest in talking about them) would also be valuable to our usability-improvement goals; any redesign should certainly retain any and all popular features or aspects of the system, and desirable attributes of the current system could be applied to the development of new features.

We prepared an interview guide that not only contains a series of questions, but also guidelines on how to complete the interview from start to finish. It was designed for an interviewer who is not an expert in this topic. It includes opening and closing remarks, as well as guidance on arranging the room, explaining the interview to your subject, creating a comfortable environment, reading nonverbal cues, avoiding biasing the interview, and keeping the interview on track.

The guide was in tabular form. Each question appeared on the top of a page; follow-up questions and notes to the interviewer were included in the table for each question. In addition, the table provided the interviewer with ample space to note the participant's responses, the interviewer's own follow-up questions, as well as any other important information.

FINDINGS

As anticipated, users mostly elaborated on the problems and frustrations they had with the kiosks. However, the overwhelming feeling towards the functionality of the kiosks was positive. That is, users generally believe they work well for the most part, and while some users believed improvements were more necessary than others, they all viewed their suggestions as fine-tuning.

No one claimed that problems with the kiosk ever prevent them from using it. However, certain limitations of the kiosk system do sometimes cause users to choose a traditional checkout lane instead, namely having either a large amount of groceries or produce to purchase. Payment-related issues were also somewhat of a recurring theme.

Non-operational, aesthetic concerns were also cited by some interviewees, which was not anticipated by the project team--we perhaps had underestimated the power of aesthetics in determining satisfaction.

ANALYSIS AND RECOMMENDATIONS

The following is a list of all redesign recommendations derived from interviewees' comments:

SEPARATE 'CREDIT' AND 'DEBIT' OPTIONS

The Dominick's payment system presents several payment options, among them a choice for 'Credit/Debit.' When you select this option, the system instructs you to complete your transaction at the PIN-pad. Then when you actually go to pay at the PIN-pad, it prompts you for your PIN number. If you're using a credit card or a debit card and actually want the transaction to register as 'credit,' you have to press Cancel at the PIN screen. This creates confusion.

There are two options to make payment with a credit card (or with a debit card run as credit) simpler:

- Once the system directs the user to the PIN-pad, it should present options for entering your PIN or choosing credit, rather than defaulting to the 'enter your PIN' screen.
- There should be separate the payment options in the system, so that separate buttons appear for 'credit' and 'debit.' Then when the user is directed to the PIN-pad, it is already set up for their payment option of choice.

RECONFIGURE MAIN SYSTEM/PIN-PAD INTERACTION TO REMOVE CONFLICT

Currently, when the user selects 'Debit/Credit' from the payment options screen, the screen displays a message directing the user to slide their card in the card reader. However, at this point in the transaction, the card reader is not yet ready for this action. Instead, when the customer goes to swipe their card, the reader displays a message asking the user to select their method of payment. Only after selecting this option (again) can the user swipe their card to complete the transaction. There are a couple of different ways to resolve this conflict:

- After the method of payment is selected on the main screen, the next message could read something to the effect of 'Please use the PIN-pad to complete the transaction.' This is the easiest yet least desirable resolution, as the user still has to select their method of payment twice, an unnecessary redundancy.
- Set the system up so that the PIN-pad is actually ready for the user to swipe their card when the message from the main screen directs them to do so.

MORE PLU CODES ON PRODUCE

Interviewees complained about purchasing produce that doesn't have a PLU sticker on it, as users must locate non-stickered items on a menu. Confusion about how to look up certain items abounds--for example, *pepper, red, or red pepper*? Even when there is no confusion, this can be a time-consuming process, especially if the user has several items to look up. Additionally, if users cannot remember what type of, say, apple it is, they may just make a selection from the menu without knowing for sure if it is correct. This phenomenon could be leading to revenue loss for Dominick's.

A COUPON RECEPTACLE

Currently, the attendant has to come over to the kiosk to approve a user's coupons. A system that accepts the coupons and approves them would save the user time and eliminate a task for the kiosk attendant.

ALLOW FOR PURCHASING GIFT CARD AT KIOSK

Gift cards are not presently available for purchase at the kiosk; perhaps they could be scanned as any other item, and value could be added on the screen.

CONVEYOR BELT BAGGING SYSTEM

As seen at Jewel. Rather than placing their items on a scale, users can place them on a gravity powered roller conveyor (made up of rotating cylinders) that transports the items to a metal landing. This eliminates bagging area error messages (e.g. 'unattended item in bagging area') and allows the next user to begin scanning while the previous user begins bagging their groceries.

and/or

INCREASED SCALE SENSITIVITY/ACCURACY

Most of the complaints from interviewees had to do with scale-related errors. Increasing the scale sensitivity and accuracy could prevent such problems as:

- The scale not detecting very light items, like green onions
- The system thinking that something was added to the scale when it was not

BETTER LINE MANAGEMENT

Make it clear that there's either one big line or separate, smaller lines for each kiosk. Users have identified ambiguity in line structure that can lead to confusion. Most of the time, one big line is recommended, so shoppers don't think that other shoppers are 'cutting.' It could also reduce cognitive load as users don't have to guess which line will move the fastest. In certain cases, however, depending on such factors as floor plan and layout, separate lines may be more practical.

INCREASE SPACE ON THE PRE-SCAN SIDE OF THE KIOSK

Occasionally, kiosk users may be carrying additional items other than their basket (such as 2-liters of soda or a purse/bag), so additional space to accommodate these items could be useful.

MUTE VOICE PROMPTS OPTION

Interviewees complained about how the Dominick's kiosk is noisy, and how some kiosks at other stores provide an option to mute voice prompts. This would be a great option to include for noise-sensitive customers.

FASTER SYSTEM

There were complaints that the system doesn't move fast enough, that after each item is scanned, the user has to wait for the system to register the scanning and placement in the bagging area before the next item could be scanned. The system should be able to move as quickly as the user can.

ATM-LIKE CASH COUNTER

Inserting multiple singles can be laborious and time-consuming; it was suggested that the kiosks implement an ATM-like cash receiving system, wherein the user can insert all their cash at once.

REDO KIOSKS IN STAINLESS STEEL

The kiosks aren't exactly designed with aesthetics in mind. One suggestion was to do them in stainless steel. A possible objection could be the resulting plethora of fingerprints, but perhaps this could just serve as an extra incentive to keep the kiosks clean. After all, we are putting our groceries on them.

COMPETITIVE ANALYSIS

INTRODUCTION

In this section, we analyze features of the self-service checkout kiosks used by several competitors. For the purposes of this analysis, we defined competitor to be any local retail business that uses similar self-service checkout software and kiosks. However, we have also tried to target businesses that also sell groceries. Our competitor selections follow a progression from high (or exclusive) grocery-store character to no grocery store character: Strack and Van Til (grocery store) and Jewel-Osco (grocery store/drug store), Meijer (hypermarket), Home Depot (home improvement/construction retailer). This progression allows for the generation of ideas and recommendations in two ways:

1. Through comparing the effectiveness of highly similar interface components
2. Through adopting entirely new interface ideas from slightly different business types (e.g. Meijer's hypermarket business model necessitates providing features for both grocery shopping and department store type retail, and analysis of these additional features could prove useful).

METHODOLOGY

As in all preceding research methods, our methodology was based around four specific areas of the self-checkout kiosk user experience:

1. Starting Up
2. Scanning and Weighing Items
3. Bagging
4. Paying.

Each team member was tasked with selecting a competitor of their choice and analyzing that competitor's self-service checkout kiosk during a shopping trip.

Since our exposure to each system during any given shopping trip was limited to avoid arousing the suspicion of the employees supervising the kiosk, we found it necessary to employ an even more narrow methodology for this particular research method. That is, we needed to make sure we were taking notes on all the important features and functions related to the aforementioned four main areas of the user experience.

Thus, we created a spreadsheet, filled out by each team member shortly after completing their competitive analysis, with the following categories under which to take notes. Table 5 shows how these categories map to the four main areas studied throughout our research project.

Competitive Feature	Map to Study Feature
Start Screen	Starting Up
Scale surface	Scanning and Weighing
Checking Out	Scanning and Weighing, Bagging
Discount Card	Bagging, Paying
Payment System	Paying
Errors	All
Help	All
Languages	All

Table 5: Competitive Features and How They Map to Study Features

This new methodology for taking competitive analysis notes continues to focus on the process of using the kiosk but is also much more heavily focused on features. This allowed us to investigate what features competitors offer that Dominick's does not. It also allowed us to focus on whether or not competitors improve upon the features that are common between their system and Dominick's kiosks.

The first four categories above map very closely to the four main areas that we had focused on before. These new categories combine the language of these four user experience-based areas with the more featured-based language required by a competitive analysis. For example, the phrasings 'Start screen' (as opposed to Starting up) and 'Payment system' (as opposed to Paying) encouraged us to take notes on the specific features of the system's Start screen and Payment system in addition to any other notes we had about our individual experiences using the system.

The final three categories pose questions to the researcher that are still highly feature-based in that they encourage the researcher to verify whether, and to what extent, these functions or features exist in the competitor system, and to take notes about how the competitor uses these functions or features in a different,

modified, or novel way. These three categories could just as easily be rephrased as the following questions to the researcher:

- Did you encounter any errors during your competitive analysis and what were the featured resolution mechanisms?
- Did you notice designated help employees in the vicinity of the kiosks and what was the function of these employees?
- Did you notice featured languages other than English in the competitor system and what were these featured languages?

Finally, before starting our individual competitive analyses, we also decided that any team member should feel free to add additional categories to the spreadsheet.

FINDINGS

A summary of our findings from the competitive analysis appears below in Tables 6 through 10, categorized by business name. For each competitive business we've summarized the pros, cons, and usability issues. Dominick's, our baseline system, appears first. Since we are looking to improve the usability of Dominick's system, we only list cons and usability issues which have become more apparent to us through the competitive analysis process.

These findings derive from competitive analysis notes listed under the eight categories indicated in the Methodology section above:

1. Start Screen
2. Scale Surface
3. Checking Out
4. Discount Card
5. Payment System
6. Errors
7. Help
8. Language

Business Name	Dominick's
Business Type	Grocery Store
Pros	N/A
Cons	<ul style="list-style-type: none"> • Shoppers need to select payment options on both the interface screen and the PIN-pad device for both credit and debit payment options. • Coupon transactions must be approved by kiosk attendant. • Does not register scanned items and items placed in bagging area quickly enough. • System sends mixed signals by instructing shoppers to swipe card through the card reader to complete transaction via the interface screen, and to select payment method via the card reader screen simultaneously.

Table 6: Dominick's Competitive Analysis Summary

Business Name	Strack and Van Til
Business Type	Grocery Store
Pros	<ul style="list-style-type: none"> • A 'Mute Voice Prompts' button that allows shoppers to turn off voice prompts. • A help button that alerts the kiosk attendant is present on <i>every</i> screen starting with the start screen. • Shoppers are allowed to scan items for a price check at the scanning screen (during check-out process). • Shoppers are asked if they have any coupons immediately after selecting the 'Finish and Pay' option from the main terminal. • Different kiosk hardware (carousel style, in addition to regular kiosks): these kiosks have a higher-capacity, rotating carousel bagging area allowing shoppers to fill several bags with groceries in rapid succession (each bag is in a separate compartment of the carousel). • Faster system response (as far as scanned items and items placed in bagging area registering quickly in the system) • System is less noisy, with very few beeps and a softer default volume-level for voice prompts. • Shoppers can select any item in the store (even items that have barcodes) from the 'Look up item screen' (not just produce).
Cons	<ul style="list-style-type: none"> • Shoppers cannot change the volume of voice prompts (i.e. make the voice softer), only turn them off completely.

Table 7: Strack and Van Til Competitive Analysis Summary

Business Name	Jewel-Osco
Business Type	Grocery Store/Drug Store
Pros	<ul style="list-style-type: none"> • A volume customization button on the start screen allows users to customize the volume of the voice prompts. • Shoppers are allowed to scan items for a price check from the start screen prior to beginning checkout. • Different kiosk hardware (conveyor belt style): After scanning and/or weighing items, shoppers place items on a rolling belt of revolving metal cylinders that lead to a metal landing receptacle. Shoppers continue to pay for items (checkout) and then bag their items at the receptacle afterwards.
Cons	<ul style="list-style-type: none"> • Coupon transactions must be approved by kiosk attendant.

Table 8: Jewel-Osco Competitive Analysis Summary

Business Name	Meijer
Business Type	Hypermarket
Pros	<ul style="list-style-type: none"> • A volume customization button on the start screen that allows users to customize the volume of the voice prompts. • Shoppers are allowed to scan items for a price check from the start screen prior to beginning checkout. • A help button that alerts the kiosk attendant is present on every screen starting with the start screen. • Shoppers have the option of printing gift and/or rebate receipts. • At scanning screen, there is a visual reminder for their rewards program (mPerks). • Different kiosk hardware (conveyor belt style, in addition to regular kiosks): After scanning and/or weighing items, shoppers place items on a conveyor belt that leads to a terminal receptacle. Shoppers continue to pay for items (checkout) and then bag their items at the receptacle afterwards. • Available (extra) kiosk attendants frequently help bag items at the conveyor belt style kiosks. • Supports greater number of languages: Polish (in addition to English, Spanish)
Cons	<ul style="list-style-type: none"> • If item is placed in bagging area too abruptly after scanning, the system outputs the error message 'Unexpected item in bagging area.' When the same item is removed abruptly, the system outputs an error saying that an item was removed from the bagging area.

Table 9: Meijer Competitive Analysis

Business Name	Home Depot
Business Type	Home Improvement/Construction Retailer
Pros	<ul style="list-style-type: none"> • Shoppers can press a 'Heavy Item' button prior to scanning (perhaps alerts attendant to help). • Interface has a scroll bar feature that allows shoppers to scroll up and down on the list of recently scanned items using up and down arrow buttons. • A 'Call Attendant' button that alerts the kiosk attendant is present on every screen starting with the start screen. • A shopper account look up option is on the payment selection screen. • A club card look up button is available (presumably by phone number). • Shoppers need only select payment options through buttons on screen and not on the PIN-pad (when using credit/debit payment options). • Processing time for credit card transactions is significantly shorter. • Shoppers can switch the interface language in the middle of their transaction.
Cons	<ul style="list-style-type: none"> • If an item is not scanned and is placed in the bagging area, the system resets and tares the scale accordingly so that customers can continue to use the kiosk as if the item isn't there. There is no way of alerting the customer that s/he may have unintentionally forgotten to scan the item.

Table 10: Home Depot Competitive Analysis

ANALYSIS AND RECOMMENDATIONS

The following recommendations follow from the findings tabulated above:

ADDITIONAL LANGUAGES

We also noted that Meijer has a Polish language option in addition to English and Spanish. This particular Meijer was located in a suburb with a sizable Polish-speaking population. Dominick's should follow this example and add any other common languages in the Chicagoland area as options. Currently, for example, the Dominick's on Canal, the closest to Chinatown, does not have a Chinese language option.

Also, like in the Home Depot system, Dominick's should probably add a feature that allows users to switch languages at any phase during the checkout process. This is consistent with allowing hearing and visual accessibility to be adjusted at any time as well. (See Scrolling Feature and Visual Accessibility recommendation and Volume Customization and Noise Reduction recommendation below.)

CHECKOUT TIME REDUCTION

One of the main steps toward increasing user satisfaction is to decrease the checkout time significantly. Several of the observations from our competitive analyses address this issue.

The Meijer and Strack and Van Til competitive analyses reveal problems related to the speed and sensitivity of the system as it registers items that have been either scanned or placed in the bagging area. In the Meijer competitive analysis, we observed that, like at Dominick's, the system was relatively slow at registering scanned items and items placed in the bagging area. When an item was abruptly placed in the bagging area after scanning, the system outputted the error message "Unexpected item in bagging area." When the same item was removed abruptly, the system outputted an error saying that an item was removed from the bagging area. Strack and Van Til's system, on the other hand, was generally observed to be fast at registering all these changes as quickly as possible so as to avoid errors. The recommendation here is to find out more information about what makes the Strack and Van Til system faster and implement it in the Dominick's software (or look into switching software).

We also observed that the time to run credit cards on the Home Depot system was significantly shorter. Dominick's should also investigate into how to achieve this faster credit card reading speed.

COUPONS

The Strack and Van Til system always asks customers if they have any coupons immediately after the 'Finish and Pay' button is pressed. Dominick's should adopt this prompt for the following reasons: reminding customers that may have forgotten to apply coupons earlier, notifying customers that it is indeed possible to use coupons at the kiosk, and making the use of coupons at the kiosk more convenient.

At Jewel-Osco, too, like Dominick's attendants must verify transactions that use coupons. This makes the checkout process unnecessarily more complicated and Dominick's should look into eliminating attendant intervention. Steps should be taken to make locating and entering the coupon code as easy as possible on Dominick's coupons and kiosk interfaces, respectively.

GIFT RECEIPT

One unique attribute of Meijer's hypermarket-targeted kiosk is that customers are allowed to request a gift receipt, which prints with the regular receipt at the end of the transaction. This makes sense since Meijer sells many department store items that are likely to be gifted, such as clothing, video games, housewares, etc. Although Dominick's does not sell as many items that are commonly gifted, we should afford customers the option of doing so if they desire. After all, Dominick's does currently sell gift cards, which gives the impression that gift items are to be found in the store.

HELP BUTTON

Most of our competitors (Meijer, Home Depot, Strack and Van Til) include a 'Help' or 'Call Attendant' button on every screen of their system. Dominick's should also include a help button on every screen, as it affords every customer a worst-case scenario exit strategy for any problems they may have or errors they may encounter. Also, instead of relying on customers to ask the attendant for help, this method allows customers to register in the help queue if an attendant happens to be busy servicing another customer. This should reassure the customer and contribute to a more satisfying shopping experience.

IMPROVING KIOSK HARDWARE AND ATTENDANT FUNCTION

Several competitors have begun using new kiosk hardware, mostly in conjunction with the standard kiosk hardware. The Jewel-Osco we visited switched exclusively to kiosks with a gravity-powered roller conveyor made up of rotating cylinders, which leads to a metal landing receptacle. In this system, shoppers finish paying for items (checking out) and then bag their items at the receptacle afterwards. This frees up the scanning/payment area for the next customer while the previous customer bags her or his groceries. Meijer uses similar conveyor belt type kiosks alongside standard kiosks similar to those at Dominick's. At Meijer, free attendants (those not observing the kiosk control panel system) helped to bag groceries while the customers finished paying. Had the attendants not been there to bag, the checkout process still would have been faster, as in the Jewel system, since customers would bag their items and, in turn, free up the scanning/payment area for the next customer. Finally, Strack and Van Til incorporated higher-capacity, revolving carousel bagging areas to some of their kiosks. These new bagging areas feature multiple compartments such that customers can fill the bag in each compartment as they rotate the carousel, allowing for faster bagging and the placement of more items than usual in the bagging area.

We recommend that Dominick's at least partially adopt one of these new kiosk hardware types: conveyor belt or carousel. Incorporating these systems will increase checkout speed and make self-checkout more appealing to customers with a large number of items. If conveyor belt kiosks are included, we also recommend using any free staff to help bag items, when possible. This will encourage people with a large number of groceries to use the kiosk, since it was indicated on the survey and interviews that this group is deterred from using kiosks because they have too many items that require bagging.

LOOKING UP ITEMS

The Strack and Van Til system was unique in that it allows shoppers to look up any item in the store through the 'Look up items' screen, even non-produce items with barcodes. This gives customers one more way to add an item if they have difficulty scanning that particular item. While it might not be feasible to include the entire store's inventory in the kiosk software, perhaps Dominick's can add common item categories to make the interface as usable as possible

PAYMENT

Both the Home Depot and Strack and Van Til systems allow customers to perform credit card and debit card transactions almost entirely via the interface screen. In the Dominick's system, one must first select Credit/Debit from the payment screen and then reselect the payment method at the PIN-pad device. On these other systems, however, we found no need to repeat the same information at the PIN-pad.

We recommend that Dominick's reduce the number of steps that need to be taken at the card reader/PIN-pad device as much as possible. Shoppers should be able to specify the payment method exclusively at the payment screen.

REBATE RECEIPT

Meijer also had the unique option of printing a rebate receipt. Food rebates are actually quite common and customers are usually aware of them when purchasing an item since the rebate is often advertised on the box. We recommend that Dominick's include a feature to print a rebate receipt for a single sale item. It may not be required (that is, it might be possible to apply for the rebate without the receipt), but if it makes the rebate application easier in any way (e.g. less filling out of forms), customers will appreciate this feature.

SCROLLING FEATURE AND VISUAL ACCESSIBILITY

Our competitive analysis of Home Depot reveals a feature that allows customers to scroll through a long list of recently scanned items by clicking on up and down arrow buttons on the interface screen. Dominick's should also incorporate this feature as it allows customers to review items they have scanned (perhaps for the purpose of cancellation).

More importantly, however, incorporating a scrolling feature like this on all screens will make it possible to enhance the visual accessibility of the screen interface. Thus, we recommend (next to the volume customization button feature) the inclusion of a button that allows the user to increase the size of the text on the interface. This feature need not be elaborate—perhaps, two or three different text size settings and the ability to return to the default text size. The scrolling feature should allow the user to scroll through anything that goes off screen when the text size enlarges; however, we should try to avoid having to do this at the design stage.

VOLUME CUSTOMIZATION AND NOISE REDUCTION

The Dominick's system currently provides voice prompt alerts. However, there is no way of adjusting the volume of the voice prompts for either noise/annoyance reduction (if prompts are not needed by the customer) or, more

importantly, accessibility for the hard of hearing. The summary data from our competitive analyses shows that both Jewel-Osco and Meijer now employ a volume customization feature that allows shoppers to adjust the volume of voice prompts (by clicking on + and - buttons) from the start screen. Additionally, Strack and Van Til provides a button for muting voice prompts at the start screen.

The most logical recommendation is to also include a volume customization feature on the Dominick's start screen. This feature should allow the user to turn the volume down to effectively muting voice prompts, if desired, as well as up. The highest volume level should be the one most commonly used for hard-of-hearing accessibility in similar systems like ATMs. Also, since accessibility is of major concern, Dominick's kiosks should go one step further than our competitors and incorporate the volume customization feature on every screen (i.e., scanning and payment in addition to start). This allows a user who has already started checking out but has difficulty hearing the prompts to adjust the volume as necessary. Likewise, a hurried user who has flown through the start screen but is annoyed by the prompts can choose to turn them down or off from any other screen.

Dominick's should also take steps to reduce audible noise produced by the system in general. This will require further investigation but should include paying attention to the number and frequency of beeps as well as voice prompts.

Finally, since we plan to tackle the area of hearing accessibility, we should also design the kiosk to be as visually accessible as possible. See Scrolling Feature and Visual Accessibility recommendation above.

OTHER METHODS

REJECTED METHODS

In our original research plan, we recommended two additional user experience methods that we rejected for this final report: personas and Twitter data mining. This section discusses why we rejected them.

PERSONAS

Initially we thought that developing personas would help humanize our shoppers and provide focus. However we realized that our survey demographic questions were rather shallow and did not yield enough data to create a fully developed persona or to even determine a composite subpopulation of users. As we learned from Lidwell, Holden and Butler in *Universal Principles of Design* and in our class lecture and discussion on personas as well as the extensive persona chapter in *User Experience Re-mastered*, we would also need stakeholder input, something not possible given the restrictions of this assignment. Even though our interviews may have provided additional information to help round out our prototypical users, we rejected this user research method based on time constraints.

TWITTER DATA MINING

During class discussion when we brainstormed the 41 plus different user research methods, data mining in general, and social network data mining in particular, caught our attention. Would Twitter users have valuable input about the automated checkout procedure at Dominick's? Based on our class discussion we hoped to find information such as:

- Customer service input
- Kiosk usage patterns
- Customer satisfaction and attitudes about kiosk usage

However, Twitter posts about Dominick's and automated kiosk usage returned mostly complaints and profanities about how slowly other shoppers used the automated checkout process. Practically no tweets discussed usage or gave impressions about system features or functions. We quickly rejected this user experience method since it lacked usable data.

PROPOSED ADDITIONAL USER RESEARCH METHODS

If our project had the time and budget, we would recommend at least three more user research methods: a cognitive walk through, personas and user log analysis. We would probably also employ the A/B analysis we originally suggested as a supplement to our competitive analysis. Adding these methods would supplement our results and possibly more accurately describe user behavior.

COGNITIVE WALK THROUGH

We learned in class as well as from Wharton et. al. in “The Cognitive Walkthrough Method: A Practitioner’s Guide,” that a cognitive walk through provides useful data on one metric -- learnability. We also learned that this particularly rigid user experience research method was developed primarily for studying walk-up, kiosk-type systems, making this approach a perfect match for the Dominick’s automated checkout kiosk. We envision this type of research, which collects data from hypothetical users, to be most valuable if and when Dominick’s rolls out a new software version or even new hardware. It could give Dominick’s a more in-depth look at how its shoppers learn to use kiosks.

PERSONAS

Personas, too, would more distinctly define several prototypical automated kiosk users. Our original reason for selecting personas in our research plan still stands. Of course we would need stakeholder input, a revised survey to obtain additional demographic information and a restructuring of our shopper interviews to elicit more in-depth personal information.

USER LOG ANALYSIS

This user experience research method could be useful for obtaining specific statistics about the number and type of mistakes made by shoppers, how they recover from them and which functions are used most by automated kiosk users. These data could provide Dominick’s valuable input for determining whether design changes are necessary to improve usability and customer satisfaction.

A/B ANALYSIS

Following up on the recommendations to the system interface generated by our competitive analysis, we would implement these changes in mockups. We would then ask users to look at different system configurations and

feature layouts and to compare them with those of the current Dominick's system. This method will help us to prioritize the recommendations list generated by the competitive analysis, and will also likely generate new recommendations by users.

RECOMMENDATIONS

Table 11 below summarizes each recommendation for changes to be made to the Dominick's self-service checkout kiosk, what user research method uncovered that recommendation as well as a hyperlink to the section of this report for additional details.

Recommendation	Method
Add additional common languages	Competitive Analysis: Additional languages
Allow users to switch languages during checkout process	Competitive Analysis: Additional languages
Reduce checkout time by investigating faster systems	Competitive Analysis: Checkout time reduction Interviews: Analysis/Recommendations
Ask customers if they have any coupons after the final payment button is pressed	Competitive Analysis: Coupons
Eliminate the need for attendant intervention with regards to using coupons as much as possible	Competitive Analysis: Coupons Interviews: Analysis/Recommendations
Consider adding a gift receipt option	Competitive Analysis: Gift receipt
Add a ubiquitous Help button (on every screen)	Competitive Analysis: Help button
Consider incorporating new kiosk hardware (conveyor belt or carousel, or more sensitive scale)	Competitive Analysis: Improving kiosk hardware and attendant function Interviews: Analysis/Recommendations
If conveyor belt hardware is added, consider tasking free employees with bagging duties.	Competitive Analysis: Improving kiosk hardware and attendant function
Allow shoppers to look up any (or more) items in the store; even items with scannable UPC codes	Competitive Analysis: Looking up items
Avoid redundancy between Payment interface screen and PIN pad	Competitive Analysis: Payment Interviews: Analysis/Recommendations
Consider adding a Print Rebate Receipt option	Competitive Analysis: Rebate receipt
Add a scrolling feature to the screen interface	Competitive Analysis: Scrolling feature and visual accessibility
Add a text-size customization feature for enhanced visual accessibility	Competitive Analysis: Scrolling feature and visual accessibility
Add a volume customization feature for enhanced hearing accessibility	Competitive Analysis: Volume customization and noise reduction
Investigate noise reduction strategies, including a 'mute voice prompts' option	Competitive Analysis: Volume customization and noise reduction Interviews: Analysis/Recommendations
Separate 'Credit' and 'Debit' payment options	Interviews: Analysis/Recommendations
More PLU codes on produce	Interviews: Analysis/Recommendations
Allow for purchasing gift card at kiosk	Interviews: Analysis/Recommendations
Increase space on pre-scan side of the kiosk	Interviews: Analysis/Recommendations
ATM-like cash counter	Interviews: Analysis/Recommendations
Redo kiosks in stainless steel	Interviews: Analysis/Recommendations
Target shoppers who spend more on groceries, as they are the group who uses the kiosk the least	Survey: Analysis/Recommendations
Focus resources on redesigning features that are highly used, but rated low in terms of satisfaction such as searching for UPC codes for non-barcode items and purchasing age-restricted items	Survey: Findings
Reduce perception of long lines/Better line management	Survey: Analysis/Recommendations Interviews: Analysis/Recommendations
Reduce the perception that customers have too many items to use the kiosk	Survey: Analysis/Recommendations

Table 11: Summary of Recommendations

PLAN SUMMARY

While our research shows that users are generally satisfied with Dominick's self-service kiosks, both usability and satisfaction levels can be improved.

As outlined above, there are many dimensions in which to make improvements. Implementing our proposed recommendations will, of course, require overhead and the project team realizes that all recommendations may not survive a cost/benefit analysis. With that in mind, we discuss key recommendations below.

FASTER SYSTEM

Both competitive analysis and interview data indicate that the Dominick's system is a bit slower than similar systems. While no user expressly stated that the slowness of the system deterred him or her from using the kiosk, having an inferior system could contribute to perceptions of an overall inferior brand. Increasing checkout efficiency is always a plus as well, as a faster checkout process would lead to less waiting and, hopefully, increased user satisfaction.

HELP BUTTON ON EVERY SCREEN

This should be easy enough to add to the software, and it would comfort users to know that help is always available.

NEW KIOSK HARDWARE (CONVEYOR BELT OR MORE SENSITIVE SCALE)

The most common complaints related to errors involving scanning items, and error messages such as 'unattended item in bagging area.' The gravity powered roller conveyor system observed at Jewel would eliminate all such messages and the hassle that goes with them. This would also contribute to a faster checkout process since one customer can bag items while the next customer begins to checkout. An alternative would be to install more sensitive scales--ones that can detect very light items and don't produce as many extraneous error messages.

AVOID REDUNDANCY BETWEEN PAYMENT INTERFACE SCREEN AND PIN-PAD

No system should provide its users with conflicting or erroneous instructions, so this problem should certainly be rectified.

ADD TEXT SIZE AND VOLUME CUSTOMIZATION FOR ENHANCED VISUAL AND HEARING ACCESSIBILITY

Dominick's should do whatever it can to make its facilities, including the kiosks, more accessible to people with disabilities.

SEPARATE 'CREDIT' AND 'DEBIT' PAYMENT OPTIONS

The system should not require credit-paying users to cancel out of the PIN screen on the PIN-pad device. This is another example of the system providing conflicting and/or confusing directions.

ATM-LIKE CASH COUNTER

Cash is still quite a popular payment method, and paying with numerous bills gets tedious very quickly.

Ideally, every one of our recommendations would be implemented, but even if the redesign were limited to the above list, the usability of the kiosks will have improved tremendously. Even satisfied customers would appreciate the changes, and most of these improvements would also contribute to overall checkout efficiency, resulting in a better shopping experience for everyone.

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