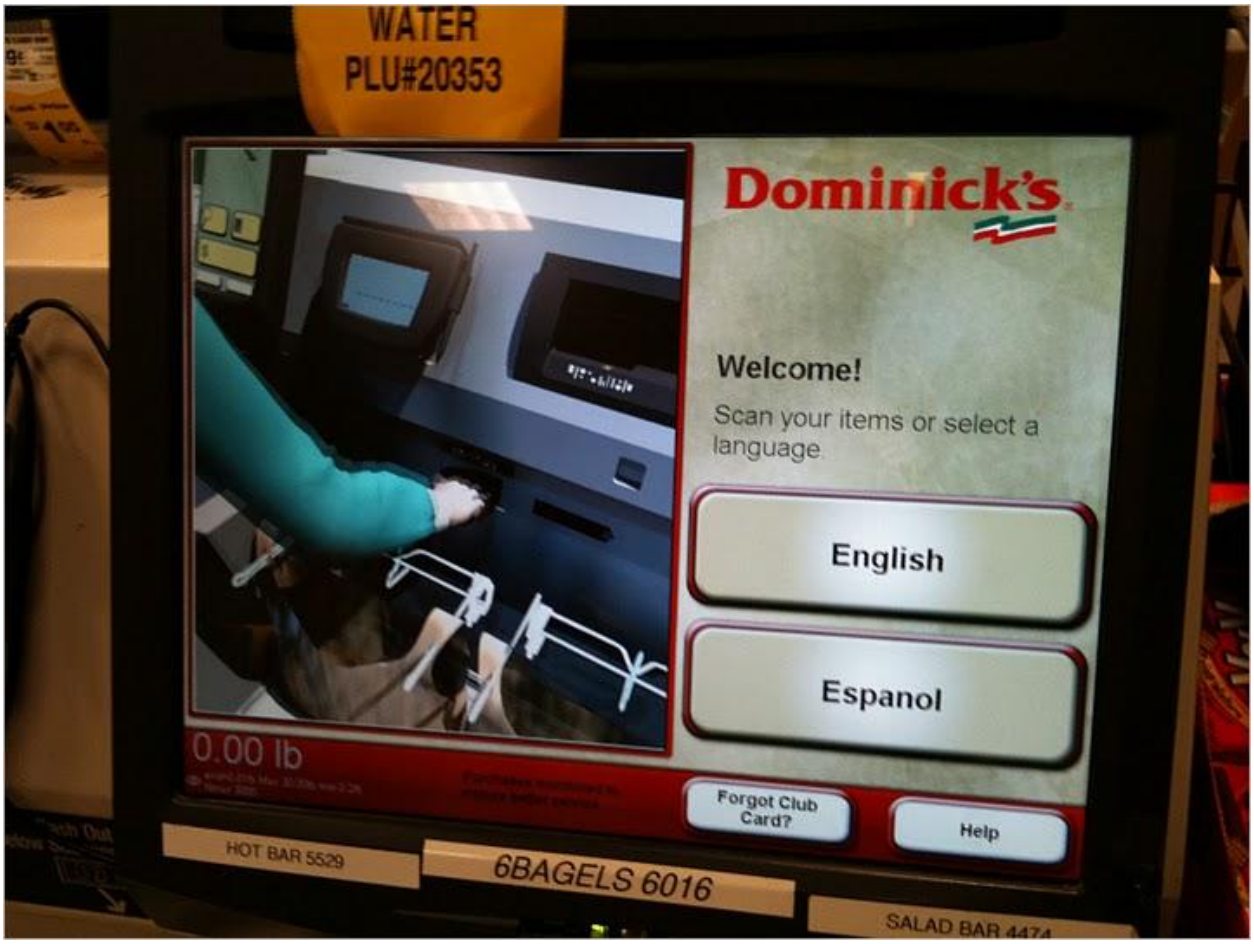
Group One Project Plan
The Dominick's Self-Service Checkout Kiosk



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Introduction

This document outlines our plan to conduct user research on the self-service automated checkout kiosks used in Dominick's stores. It presents our overall research themes and our specific research questions based on these themes. We then discuss our three major usability tests as well as three lower priority usability tests and then tie our specific research questions to the methods we'll employ to uncover usability data. Finally we provide a time line for completing our project deliverables.

Overall Research Themes

The overall themes of our research encompass these two general questions:

- 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 software to increase usability?

These two themes have guided our development of the following six, specific research questions that we will attempt to answer during our research project.

Specific Research Questions

1. What specific aspects or features of the system result in user satisfaction?
2. What features of the self-checkout kiosk justify a redesign?
3. How do we prioritize which features to redesign?
4. What features do competitors have that we could employ?
5. What makes people use self-checkout kiosks over attended kiosk stations?
6. What level of errors will users tolerate?

Each of these questions will be discussed further in this plan in context of the research methods we'll use to obtain user information.

Methods

We plan to employ a variety of methods for obtaining user satisfaction and usage information on the Dominick's self-service checkout kiosks. We have prioritized our methods. Our three major methods will be a survey, an interview and an observation. In addition, we plan to employ, to a lesser degree, personas, a competitive review and Twitter data mining.

Each general method is described in this section in more detail.

Survey

The survey is an inexpensive method which should provide demographic and preference information from a wide variety of Dominick's customers who utilize self-service checkout kiosks. This quantitative data are quick and easy to analyze to uncover user needs. We are seeking customer perceptions of self-service kiosks and their preferences in order to determine how to improve the usability of self-service kiosks such that customer satisfaction and frequency of use increase.

Our survey instrument will be made up of 22 questions. Based on Kuniavski's (2003) estimate of 30 seconds per survey question and five minutes to read the instructions, we estimate this survey will take approximately 16 minutes to complete. A conservative time range estimate would be 13 to 19 minutes, a figure we will include in solicitations. Both our question limit and time estimate meet Kuniavski's (2003) recommendation: less than 30 questions and less than 20 minutes, respectively.

Since we do not have a user database to select a sample from, we must by necessity utilize a convenience sample of persons whom we can reasonably contact. A general invitation can be sent to n persons where n is the number of persons for whom we have an email address. We recognize that there is a large degree of selection bias in this method. Ideally, a large list of email addresses would be available from which to draw a random sample of invitees; if we have access to a large enough pool of potential respondents, we could employ random sampling techniques.

The total number of users in our sample frame is unknown, making it difficult to reliably come to a decision on the minimum number of responses needed in our sample. Brinck, Gergle, and Wood (2002) recommend a minimum sample size of 50 surveys as adequate for most "practical design situations" (p. 37). Based on a 10% estimated return rate, we would need to solicit 500 potential respondents in order to reasonably assume a minimum of 50 responses (Brinck, Gergle & Wood, 2002); however, since we are utilizing a convenience sample and potential respondents may know us on a personal or professional level, we may expect a higher than average return rate which would greatly reduce the number of persons we need to solicit. Results of the survey can be examined for reliability to test for bias in our sampling methods.

If warranted, other sampling methods (advertising the survey publicly, snowball sampling, etc.) may be used, although these sampling methods also have inherent biases that must be accounted for.

We are planning to use our survey population to recruit participants for our interviews and observation methods.

Interviews

Interviews will provide us with feedback on how customers feel about the self-service checkout process. We will be able to dig deeper into the topics that we've discovered in the survey. We want specific customer experiences guide us in our usability goals of increasing customer satisfaction and frequency of use of Dominick's self-service checkout kiosks.

Since we seek to improve the kiosks, we are mainly interested in letting interviewees voice their frustrations with the current system. However, we also recognize that allowing customers to speak about aspects of the self-service checkout they really love (if they express an interest in talking about them) would also be valuable to our usability 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 plan to utilize a semi structured interview format in which our interview participants will be asked a series of questions in three different areas:

- The interviewee's shopping preferences
- The way he or she uses the automated checkout kiosks at Dominick's
- Any problems encountered and how the interviewee solved them when using the automated checkout kiosks at Dominick's.

According to Nielsen, usability testing becomes less cost effective after five users per target audience. So we plan to recruit between six and 10 participants from our survey population for the five interview slots.

Observations

Our observation method will 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. This method will provide us with information on how people actually use the kiosks, as opposed to surveys and interviews which are limited to users' perceptions on how they use the kiosks. This method is particularly useful since we are evaluating how satisfied users are with the operation of the Dominick's self-service checkout kiosk. We can observe their emotions while using the system, which is something they might not want

to talk about in an interview or even recognize that they experienced, and thus could not talk about. We will be able to obtain some clues to their level of satisfaction while using the system during observations.

We will utilize Nielsen's usability recruitment metrics and recruit between six and 10 participants for the five observation slots from our survey population. We plan to observe these users of varying abilities, backgrounds and interest levels to see how they use the system. We'll watch them start the system. We'll see what functions they use, what problems they might encounter, if any, and how they solve those problems.

We will develop an observation plan which will outline specific user behaviors and emotions to watch for including items such as:

- Identifying mistakes or confusion
- Identifying the user's emotions during transactions
- Identifying tacit knowledge and actions that are procedural in nature (performed automatically without much thought) – in other words, actions that the user would have difficulty recognizing and/or describing.

"Light" Personas

This is a lower priority method we'll employ to develop a user composite. We will try to be as specific as possible about who are composite users are, given the small amount of personal demographics we're asking for in our survey and interviews.

We are adapting the persona method to produce a less detailed persona, or a "light" persona, given the time constraints and lesser amount of personal demographics that we're collecting via our survey. These "light" personas will help us to personalize recommended design changes and will serve to humanize our target user groups.

Competitive Analysis

We will perform a scaled down version of competitive analysis in which the project team looks at the usability of self-service checkout kiosks in other grocery stores. We'll look at the competitive systems as much as possible, given the time constraints of the project timeline, to see if recommendations could be made for improving the usability of the Dominick's system based on the competitors' system design, function, features and error resolution.

Given the results of our competitive analysis, we may decide to employ some A/B analysis where we ask users to look at mockups of different system configurations or feature layouts and compare them with the current system.

Twitter Data Mining
This is our last priority in terms of usability methods employed. Mining data from social media networks such as Twitter may provide us with real time satisfaction input from Dominick's self-service checkout kiosk users who may be much more random than our survey, interview or observation participants.

We reserve the right to eliminate this as a usability method if the data we mine is not considered relevant by the project team to the final deliverables of this project.

Research Questions and Methods

This section elaborates our reasons for selecting the methods outlined in the Method section above. We have identified six questions that will guide our research toward the goal of improving usability so that customer satisfaction and frequency of use increase. We then tie the methods selected to how they will help answer each of these research questions. We also elaborate, as necessary, on why certain methods have been assigned priority over others.

What specific aspects or features of the system result in user satisfaction?

As implied by our stated research goal, we expect a more usable self-service check out system to result in greater user satisfaction and a noticeable increase in frequency of use. Therefore, it is important that we establish an initial baseline for user satisfaction with our system. Since we plan to improve specific features in the self-service checkout system (make them more usable), it is valuable to first know which features currently satisfy users, and, perhaps more importantly, which features are identified by users as clearly unsatisfactory. Having this information will help us to identify user satisfaction areas we may not have initially considered as well as to prioritize which features to redesign within the limited time frame of our project (see the next question for more details). To answer this question, our methods of choice are the survey and the interview.

Survey: In designing the survey to help answer the question, we have assumed that perceived ease of use is an indicator of user satisfaction. The survey asks respondents to rate the ease of use of various features of the self-service check out kiosk on a four-point Likert scale. Features that result in greater user satisfaction are likely to be

perceived as easy to use by respondents. The survey also asks users which features of other (competitor) kiosks they most like and why. The responses to this question could indicate potential features to include in a redesigned system that would increase user satisfaction.

Interview: The interview will provide a unique opportunity to ask users more directly about which features of the system they are currently satisfied with. Since there is a greater degree of freedom in framing questions during an interview (there is room for follow up questions, previous responses can guide future questions, the interviewer can ask for elaboration from interviewee, etc.), we expect to obtain more specific information regarding satisfaction with individual features from this instrument. Our current interview guide features a lengthy section (six questions and follow ups) that asks interviewees about current satisfaction with individual features and, more specifically, perceived ease of use (with follow-ups designed to get them talking about personal satisfaction). The interview guide also gives an opportunity to ask users what features of other (competitor) kiosks most satisfy them; these features can potentially be incorporated in a redesign of our system since they are known to correlate with high user satisfaction.

What features of the self-checkout kiosk justify a redesign?

The features which users deem unsatisfactory will be the features that we consider as justifying a redesign. As stated in the above section, user satisfaction will be gauged by the survey and interviews. User dissatisfaction, then, will be gauged in the same way.

Survey: Our survey has an extensive amount of questions dealing with user satisfaction. Features that score low in satisfaction may be perceived as difficult to use, and will warrant greater attention in the interview process. Likewise, features that are identified as useful in a competitor's kiosk that are also present in a Dominick's kiosk but rated low in terms of user satisfaction will be of obvious concern. Quantitatively, the survey results will balance out the individual responses in interviews by providing data that lets us weigh individual frustrations against data; the results will also aid in prioritizing elements to redesign.

Interview: To expand on our survey results, interviews will help us gauge users' attitudes toward specific features. Our interview guide has extensive instructions for the interviewer which will help him or her to identify responses and body language that provide additional information on user satisfaction with kiosk features (for instance, a user might say he or she is satisfied, but may non-verbally express frustration, or indicate that a feature that they are highly satisfied with could still stand to be improved). Systemic difficulties related to the overall experience at a kiosk (e.g. wait time, long

lines) will also factor into investigating which features should be redesigned; for example, if the overwhelming complaint from users is wait time, features that take the longest to execute might be prioritized over similar features, regardless of their individual satisfaction ratings.

How do we prioritize which features to redesign?

As stated in the previous item, knowing which features are identified by users as clearly unsatisfactory will help us prioritize which features to redesign within the limited time frame of our project. Likewise, knowing which features are currently viewed as satisfactory will help us avoid wasting time redesigning features that may not warrant priority attention at this time. The main methods that will help us obtain this information are the survey and he interview; however, we also plan on using less rigorous variations of the personas and observation techniques to obtain additional information.

Survey: The survey asks respondents to indicate all difficulties they have encountered (from a list of common difficulties). It also asks for perceived ease of recovering from these difficulties and the specific method of recovery. These points of difficulty will help us assign priority to individual features in our redesign; features that result in a higher perceived difficulty (whether during the actual process, during error recovery, or both) will be targeted for redesign (assigned priority status). Also, questions pertaining to ease of use and user satisfaction in the survey (see previous question) help us in prioritizing which features to redesign.

Interview: As stated previously, our interview guide features a lengthy section that asks interviewees about current satisfaction with individual features and, more specifically, perceived ease of use (with follow-ups designed to get them talking about personal satisfaction). Naturally, these responses would also help us assign priority to individual features with respect to our redesign. The interview guide also features a section that deals specifically with difficulties users may have had in the process of using the current system. The opportunity for follow-up in this section will allow us to obtain responses that will help us pinpoint the ‘problem’ features that our customers feel most strongly about (and thus deserve priority in our redesign).

“Light” Personas: In our adapted version of the personas technique, we plan on modeling *very basic* customer bios based on information from our survey (and other research instruments). We plan on using this technique mainly as a way to organize this information; our personas will be built from the most common responses to questions relating to user satisfaction, frequency of use, ease of use, and difficulty using the system. This exercise will also serve as a check that we are designing for the typical

user. Our final result (one or two basic personas) should be representative of the most common needs voiced (directly or indirectly) by respondents to our other instruments.

Observation: Our largely informal observation work will involve accompanying acquaintances on their regular scheduled trips to Dominick's, offering us the opportunity of directly viewing which features users may encounter difficulty with. This will allow us to observe "real world" interactions between users and the kiosk, and ensure that we are not wasting resources on redesigning features that are perceived as difficult to use, but are not sources of difficulty for actual users.

What features do competitors have that we could employ?

It's not feasible to generate every innovative concept, but there's no good excuse for not copying those of others, and quickly. Obviously, patent and copyright laws prevent this from being done to some degree, though there are often more basic concepts that can be gleaned from even a cursory study of a competitor's product. Like, say, an extra item on a welcome screen of a program providing a different, perhaps preferable (for at least some users) point of entry into the system. Determining whether or not the competition has a "leg up" on Dominick's, and then getting our legs up there, too, is perhaps one of the easiest and best ways to improve usability of the self-service kiosk.

Competitive Analysis: We plan to make trips to several other stores that employ self-service kiosks, including direct competitors (Jewel and Strack and Van Til) as well as other large chain stores whose business does not directly overlap with Dominick's (CVS and Home Depot). Most of the analysis will be focused on the direct competitors, as their system will likely be designed to handle the same sort of inventory, checkout process, and customer base. We've decided that it would be beneficial to analyze the self-service kiosks at a couple of non-competitors as well because even though the business and the inventory may be very different, the process of checking out is likely to be quite similar, and there may be features or characteristics within these systems that could be advantageously employed on the Dominick's system. In each analysis, we will look at the various screens the system displays as we go through the checkout process with an eye out for elements that could be appropriated into the Dominick's system.

A/B Analysis: As time and resources permit, we will draw up mock-ups of screens from the various other self-serve kiosk systems we analyze and present them alongside mock-ups of screens from the Dominick's system to potential users of these systems. Obtaining direct feedback from users as to which features, layout, or processes they prefer could be instrumental in determining and designing for peak usability. Depending

on the type and degree of differences we observe, this portion of the study may not be necessary.

What makes people use self-checkout kiosks over traditional (attended) checkout stations?

If users are unwilling to go to a self-service kiosk, further efforts need to be made to determine why. No amount of feature redesign will encourage users to utilize a kiosk if they prefer to utilize traditional stations (since presumably, traditional stations will remain an option in the foreseeable future). To do this, we must tease out biases against kiosks as well as determine which features of a traditional station users find preferable to a self-service kiosk, and then determine how those can be incorporated into the kiosk system.

Survey: We specifically ask in our survey for reasons why a user chooses not to use a self-service kiosk. Those responses will serve as general areas with which to begin our investigation into differing user experiences.

Interview: The survey responses will allow our interviewers to follow up on questions related to comparative user satisfaction between traditional and self-service checkout experiences. These specific questions will allow us to identify misconceptions and probe for further details concerning why the user perceives kiosks to be deficient to traditional checkout stations. Our interviewers might also be able to pose or elicit possible alternatives in kiosk system design (based on survey feedback) to get feedback on what particular improvements could be made to kiosks to make them more approachable for trepid users.

Observation: Observing users behavior as they approach and interact with the kiosk will yield results that would suggest user attitudes (e.g. does the user approach slowly, fumble with selecting options, or display other signs that relate to nervousness or unease with the technology). Also, surreptitious brief spot observations of user behaviors as they approach the checkout area might demonstrate particular patters in decision making by consumers. These observations will be made if this question needs further exploration or additional data to draw conclusions; observations not related to our formal observations will also be contingent on the amount of time we have available to allocate to the supplemental research methods we describe in this project plan.

What level of errors will users tolerate?

It is, of course, of utmost importance to know what sorts of errors, or what frequency of errors (both generally and of certain types), will cause users to abandon the self-service kiosk system. By “abandon” we refer to both a user giving up and walking away in the middle of the checkout process, and more broadly the cultivation of the overall impression that self-service kiosks are more trouble than they’re worth. We seek to employ several instruments to ascertain how to prevent either of these phenomena from occurring.

It should be noted that both in our survey and interview, we avoid using the term “error”, as it is more or less a technical term that begs a definition in the context of the questions being asked, and is also somewhat inflammatory--simply implying that errors exist in the system could cause respondents to remember their shopping experiences more negatively. Asking about “difficulties” is a more neutral way to frame the issue, as “difficulties” can occur independently of system malfunction. This also frames the issue more broadly; if difficulties are being encountered by users apart from system error, we want to know about those, too.

Survey: As outlined in the “How do we prioritize which features to redesign?” above, our survey asks respondents about various difficulties they have encountered with the system. We ask respondents about what type of difficulties they have encountered, how they recovered from them, and how easy it was to recover from them. Data collected from this survey should provide us with information about the most troublesome errors, the elimination of which would take high priority in any redesign.

Interview: The interview is a golden opportunity to probe respondents in-depth about their experiences encountering errors with the self-service kiosk. First of all, the interview contains explicit instructions to be very wary accepting “no” for an answer to “have you ever encountered any difficulty while using the Dominick’s self-serve kiosk?” While on the survey, the respondent can simply say “no” and then move on, the interviewer will ask follow-up questions to ensure that the user has indeed never experienced difficulty with the system (a scenario which we find unlikely, given the variety of tasks involved with the self-checkout process and the multitude of possible problems that can occur). Additionally, the interview is an opportunity to gather richer qualitative data--it will be much easier to interpret the *extent* of the difficulties encountered with the system, and that is exactly what we’re looking for--the level of frustration expressed should give us a very good idea of what kinds of errors, and with what frequency, users will tolerate.

Observation: Observing any errors encountered by individual users could be the most direct source of information about what level of errors users will tolerate. Seeing the errors encountered in real time, and directly observing the reactions to them, will provide us a filter-free glimpse as to how system errors affect users. Both of the previous instruments discussed involve recording impressions after some separation from the experience, which of course can lead to poor recall of the events that happened in the experience or the reaction to these events at the time. It's not possible to obtain nearly as large of a sample size via observation, at least on our time frame and budget, but even an extremely small sample can provide relevant data, given the immediacy of the data collected.

Timeline

	Deliverables	Due Date
Survey	Survey finalized and distributed	10/1/10
	Survey closed and data prepared for analysis	10/17/10
	Final write up	10/20/10
Interview	Interview guide finalized	9/22/10
	Interviews scheduled	10/24/10
	All interviews conducted and results written up	11/3/10
Observation	Observation guidelines finalized and written up	10/24/10
	Observations scheduled	11/3/10
	All observations conducted and results written up	11/10/10
Other	Other methods finalized and scheduled	11/10/10
	Other methods conducted and results written up	11/24/10
Final report	Preliminary draft	12/1/10
	Final draft and presentation	12/8/10