Context-Aware Grocery Self-Checkout Systems

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User-Centered Research and Evaluation (Section E)
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1 Executive Summary

Customer awareness and use of self-service systems is growing. Most customers are now used to making bank transactions with an ATM and checking themselves in at the airport. Suppliers have worked with grocery stores recently to diffuse self-checkout systems—allowing users to scan, bag, and pay for their purchases with little or no employee intervention—in supermarkets, but acceptance of these systems by shoppers has been slow. How can grocers make alterations to an expensive hardware and software system to make their investment more worthwhile? This report explores a redesign of the user interface present in an existing self-checkout system. It aims to personalize the interface with one that is welcoming, useful, and easy to use system for the customer.

New and innovative technologies can only succeed when customers begin to accept them as innovative. According to the academic literature, automated systems have extended to retail but have struggled to be accepted because users don't currently see them as *useful*, *easy to use*, *reliable*, or *fun*. However, no academic study has been undertaken of self-checkouts in the grocery domain.

Through interviews and contextual inquiry, I explored users' opinions about these four attributes of self-checkout systems. I confirmed that the problems cited in the literature in the overall retail domain also exist specifically in the grocery domain. I further interpreted my user research through contextual inquiry models and affinity diagramming; this helped me identify a fifth attribute of grocery self-checkout systems: *lack of confidence*.

I developed a paper-based prototype of a hypothetical context-aware grocery self-checkout system to address these issues. Specifically, my software product changes the interface based on a user's history and experience with self-checkout systems, and it simplifies the process of produce selection by automatically storing a user's favorite items—and allowing them to further refine that menu through the interface. All of this awareness is based on a user's loyalty card, a common feature of many supermarket chains and of my client (Giant Eagle, Inc.) in particular. Based on my user research, such a product would bring a friendlier, personalized feel to the self-checkouts—hopefully evoking the process of buying goods from a neighborhood market where the owner knows each customer and his preferences.

To validate my prototype, I conducted think aloud sessions with three self-checkout system users. All three users thought the addition of personal favorites was a welcome change to the interface, and they all felt it would simplify the slowest part of the self-checkout process for them. However, the think aloud sessions revealed that the prototype

is not without issues of its own. In particular, adding software features without informing the user does not help the user discover them.

Automation across all industry domains is rapidly changing traditional service interactions. Customers are beginning to accept the role of 'self-service provider' in retail, and this affords grocers a golden opportunity for cost-savings. Through more careful design and implementation of user-centered self-checkout systems such as the one I present, grocers can expect an increase in user acceptance of automated services.

2 Design / Recommendation

2.1 Literature review

Self-checkout systems provide a potential cost savings to grocers, because one employee can typically handle up to four self-checkout systems. They also allow for grocers to both adjust for demand fluctuation without adjusting employee schedules and help to provide consistency in service regardless of employee mood [9]. Finally, there is a fundamental portion of the population that prefers not to interact with human employees in retail: very early research indicated this is anywhere from 5 to 29 percent of customers, depending on the service scenario (although grocery shopping was not among the six scenarios surveyed) [1].

Although no study of self-checkout technologies specific to the grocery domain has been undertaken, there is an extensive literature on self-service technologies in general; they mostly focus on determinants of self-service technology acceptance [2, 3, 4]. They in turn reference psychological studies, notably the Technology Acceptance Model theory [5], which argues that technology acceptance directly reflects the strength of attitudes and intentions towards using that technology. Expanding on this, Childers *et al.* [2] conducted an extensive survey of self-checkout users and confirmed that four attributes of the system are significantly responsible for customers' attitudes about them: (a) perceived usefulness, (b) perceived ease of use, (c) reliability, and (d) fun associated with using the system.

2.2 User research

My user research focused on investigating users' opinions of the four attributes listed above. I conducted a contextual interview with one grocery shopper during his self-checkout experience and semi-structured interviews with two other shoppers, one of

whom also owns a small neighborhood market in Pittsburgh. Full descriptions of the interviewees are in the appendix. My interviewees were all sharing their experiences with self-checkouts at a supermarket in the Pittsburgh area, and the interviews were all fairly brief (lasting from 10 to 30 minutes). Questions ranged from general grocery-buying habits to common problems encountered with self-checkout systems, and they were intended to bring out attitudes about the aforementioned four attributes without explicitly using those terms.

2.3 Research results

From model consolidation and affinity diagram interpretation (see Appendices C and D on pages 14 and 19, respectively), I identified significant problems my users had experienced with self-checkout systems that affected their perceived usefulness, ease of use, reliability, and fun in using the systems. Additionally, I identified another attribute related to perceived ease of use but distinct: users lack confidence with using the systems. I identified four primary breakdowns:

(1) While self-checkout systems are ostensibly more convenient than traditional checkout lanes, they still involves tasks and requirements users consider unpleasant: bagging, ensuring proper weight, and using a small space.

(2) Waiting for attendants—who are often unfriendly—to help fix problems slows users down.

(3) Users feel uncertain about how the system works and lack confidence that they can use it problem-free.

(4) Even after the transaction, users are not certain they did everything correctly and got all the right prices.

Any solution should address these problems, but must also consider the constraints of current self-checkout systems. It's very difficult to address problem (1) without modifying the physical design of the system. This is a costly expectation, as grocers pay around $75,000 to $100,000 for a four-lane system from IBM—one of a few major suppliers [6]. Problem (2) really describes two problems—a lack of attendants and attendants who appear unfriendly. Clearly grocers can't add attendants to solve the problem, or they would be directly lowering their cost benefits in using self-checkout systems; however, a training program in helping attendants identify unconfident users or augmented attendant displays that convey user comfort with the system might help address the problem.

The meat of my solution addresses problems (3) and (4), which are primarily related to feedback and display information, which I believe is the cheapest redesign solution.

Users primarily want to save time by using self-checkout systems, but they also want to understand how the system works so they can gain confidence in using it. Furthermore, users expressed a desire to learn from their mistakes by having employees or the system itself help them work through a problem, rather than simply solving it with cryptic override actions.

Users also noted that they feel generally comfortable with the self-checkout system's large interface buttons, which easily help scaffold their next steps; they also like that the system provides both auditory and visual feedback, though they admitted the feedback was sometimes unhelpful.

2.4 Solution

My solution provides grocers with a new self-checkout system software design which helps mitigate the problems identified in my user research. By exploiting Giant Eagle's Advantage Card, we can provide a context-aware (see [8]) self-checkout system experience which adapts its interactions and interfaces based on a user's past experience.

Since 1995, Giant Eagle has offered its customers a free loyalty program which lowers item prices across the store, as well as providing them with fuel and food discount incentives based on their purchase values. Although Giant Eagle did not respond to an interview request to learn more about what the company saves about each user, my solution makes the assumption that individual item purchases are stored. Using this customer history, I propose the first primary augmentation to the self-checkout interface: a 'favorites' menu for items which cannot be scanned with a traditional UPC code. This favorites menu (see a prototype look and feel in Figure 1) would auto-populate with a user's most often purchased items, allowing for quick selection without searching through several produce screens. This menu aims to satisfy the user's first criterion—improving the time it takes to move through a self-checkout lane. The concept of favorites can extend to many features of the interface. Does the user typically use coupons? If so, provide a reminder to insert coupons. Does the user always pay with card or cash? If so, limit the payment screen options to card and cash, and hide the others behind a menu.

The second major feature of my redesign involves adjusting the user interface based on a user's experience with the self-checkout system in the past—again using the user's loyalty card to determine their experience. Many automatic teller machines and airport check-in kiosks adapt in this way, hastening the self-service process for expert users while

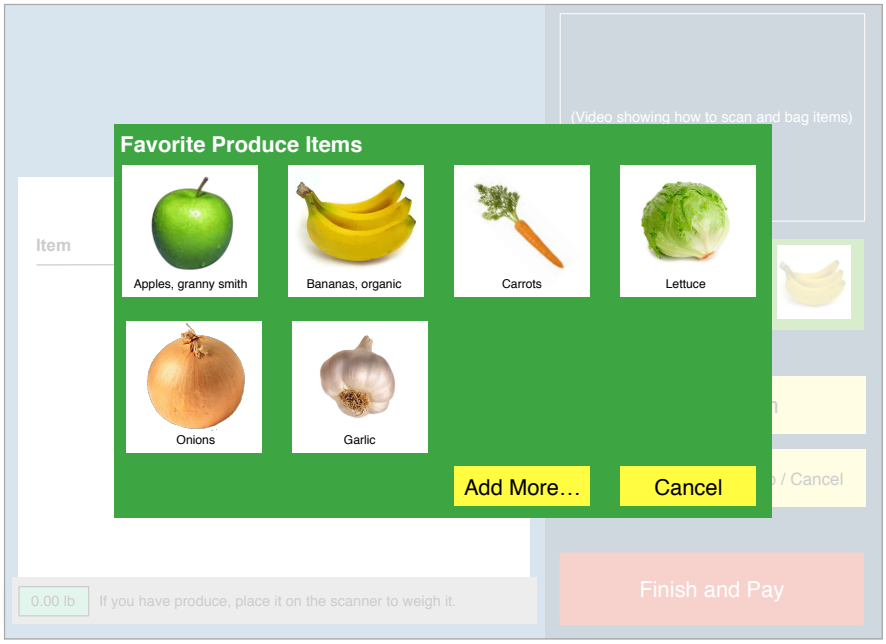


Figure 1: The favorites menu.

providing support for novices. Most self-checkout systems (including the Giant Eagle models I examined closely) currently provide some goal reification in the form of looped animations throughout the checkout process demonstrating how to accomplish tasks with the system. These animations directly address Nielsen's heuristic (see [7]) of providing a match between the system and the real world, but they limit flexibility for experienced users. In particular, they obscure part of the scrolling receipt as users scan more and more items—limiting feedback and contributing to problem (4) identified in my user research.

To address this problem, I propose an algorithmic 'experience score' calculated and stored for each user's familiarity with self-checkout systems. Among the input values would be total number of items scanned in the past, time spent per item, and the number of problems a user has encountered. The interface would then adjust its feedback based on user experience; in one example, the animation screen space would be replaced by more space for the user's live receipt. This feedback can be provided to the attendant as well. Suppose that a particularly unconfident user has approached a system and needs help; the new system would alert the attendant to watch them especially carefully. Coupled with appropriate training of how to help users through problems, this feature also hints at technological solutions to problems (1) and (2).

A final notable feature is the simplification of the main scanning screen to just five buttons (two are new): the aforementioned 'Favorites' menu, a traditional 'Look Up Product' button, an 'Ecobag' option, a 'Help / Cancel' button, and the traditional 'Finish and

Pay' button. The ecobag button allows the user to use their own, environmentally-friendly bag by temporarily freezing the weight checker and letting the user skip bagging of an item.

2.5 Solution metrics

Successful self-checkout systems should both decrease the average time spent with a self-checkout system per customer and provide the user with high subjective ratings of perceived usefulness, perceived ease of use, reliability, and fun. Additionally, most grocery stores would presumably like to see an increase in the percentage of service at the store rendered through a self-checkout system, which currently hovers around 15% for most stores [6].

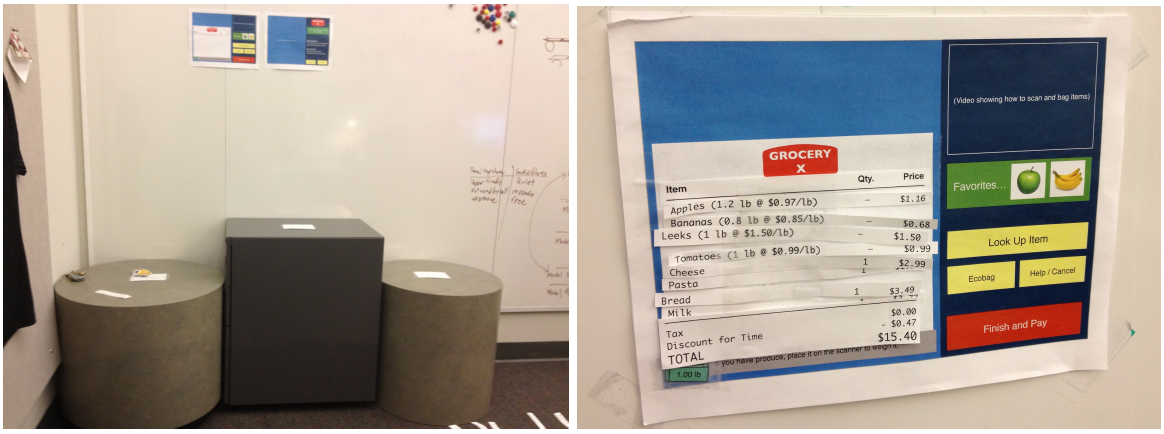
To measure customer satisfaction with the new interface, a survey should be undertaken with willing shoppers, filtering for customers who have loyalty cards. Before they use the system, a pre-questionnaire should ask closed-ended questions that measure their experience and comfort with self-checkout systems; specifically, the questions should aim to capture the four attributes of usefulness, ease of use, reliability, and fun. After using the system, a post-questionnaire should be administered with the same questions, and the results can be compared. Additionally, demographic information such as age, gender, and education level could be collected, although I have no hypotheses that suggest such demographics affect the desired attributes.

3 Evaulation

3.1 Overview

To evaluate my design, I made a paper prototype of my new interface, and I constructed an approximately-to scale physical self-checkout system with tables and walls, as seen in Figure 2. Full screenshots of the paper prototype screens and interactions are in Appendix F, beginning on page 22.

To test this prototype, I conducted three think aloud sessions based on a hypothetical grocery trip. Users were told to follow the prototype screens and instructions as needed in order to complete checkout with eight items placed in their shopping basket. Each think aloud ran from eight to ten minutes, with all users participating in a short followup question and answer session. (Because I did not believe my sample size would be large enough to validate any hypotheses and because I did not feel the prototype replicated



(a) The entire physical prototype setup (b) The final screen after the task is complete

Figure 2: The prototype setup.

the entire self-checkout system experience accurately enough, no formal survey was administered.)

The participants were all full-time students in their 20s who participated in the think aloud session in my project room space at the MHCI Lab in Oakland (see Appendix A on page 11 for more elaborate user profiles). My primary goal was to evaluate how effective the 'Favorites' menu would be in grabbing the attention of users; a secondary goal was to evaluate the clutter and feel of the user interface, which I had not been able to very effectively do during the contextual inquiry process. The think aloud sessions were video recorded with user consent.

3.2 Results

The think aloud sessions validated the idea of customer favorites, with one user commenting that he "like[d] that featured a lot" and another using it almost immediately because the concept intrigued him. All three users had positive things to say about the new interface. Two noted that a final system must be sure to incorporate feedback that mirrors the printed receipt as closely as possible—it should show both the per-item savings and have a running total at the bottom of the screen as scanning is ongoing. A full list of suggestions and critical incidents that occurred during the three think aloud session is given in Table 2 on page 27.

3.3 Observations & Recommendations

The largest issue that arose from the think aloud sessions was the need for feedback that closely matches the printed artifacts that serve as a record of the purchase (mostly the receipt, though the groceries are also a physical record). Specifically, my prototype did not include the traditional listing of 'price saved per item,' which is currently on Giant Eagle receipts, but it should have. The same recommendation applies to maintaining a running total of the purchase as items are scanned and displaying it on the screen somewhere (both of these issues were concessions of my prototype, but are important to maintain in higher-fidelity implementations). Limiting user feedback is an especially poor idea because it exaggerates the difficulty self-checkout users can have in asking questions or getting help from employees. Since this affects all users, I have classified it as the most major issue to fix in future implementations.

Button discriminability is another issue that arose in part because the prototype was of a low fidelity. One user was not sure whether the favorites button pulled up another menu, or if the apple and banana were her only favorites. Discoverability is a key part of the success of these new features, so designers must be careful to use button designs which are familiar and/or consistent with the rest of the interface.

Additionally, careful explanation of new self-checkout system features is needed—especially in any software implementations where it may be unclear to users that there are new features. For example, one user was uncertain if the favorites menu represented his personal favorites or the store's favorites or that particular system's favorites. The idea is customer-centric, but this is difficult to scaffold on the button itself. A better recommendation is to present users with a small tutorial showing off the new feature the first time they use a self-checkout system with the new feature. YouTube, Facebook, and Twitter have all incorporated such instructional tutorials into their user interface redesigns recently. As with any video tutorial that might frustrate expert users, a 'skip' button should be available for any tutorials. As this is an especially frequent problem but one which should does not generally cripple the system, I believe it is a minor issue to fix.

Users who inquired about the 'Ecobag' button had similar confusion. The presence of a button itself does not seem to be enough of a clue about the feature, so a tutorial explaining this button as well for new users would be helpful. (Again, an implementation should be careful to not slow down users who don't care about this feature.) Much like the previous issue, this is minor.

Ultimately, any implementation of this prototypical redesign should be able to show statistical improvement in users' ratings of its usefulness, ease of use, reliability, and fun.

My think aloud sessions with a low fidelity prototype showed promising improvements compared to current self-checkout systems in the subjective attributes of usefulness, ease of use, and even fun, but only when users accept that the system is reliably faster, easier, and more useful than a standard cashier lane will they begin to adopt the technology in greater numbers.

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Appendices

A User Profiles

A.1 Interviews and contextual inquiry

- U1 is a 22-year old, female college graduate who is employed full-time as an intern at a theme park. She lives with roommates but buys food only for herself. We conducted the semi-structured interview at her parents' home in the Pittsburgh area on October 16. She had occasional experience using self-checkout systems while grocery shopping as an undergraduate, although she admitted that the grocery store she currently frequents does not have them, so her comments were retrospective.

- U2 is a 30-year old, male, European graduate student at Carnegie Mellon University. He lives by himself. I conducted a contextual inquiry with him as he used a self-checkout system with about a dozen items at the Giant Eagle Market District in Shadyside on October 19. Due to Giant Eagle's policy against in-store recording, I took notes while he checked out and we conducted a retrospective interview about the process outside the store immediately following the task. He had only used the self-checkout system once before our interview.

- U3 is a small business owner of a neighborhood market in Pittsburgh in her fifties. She was formerly a preschool teacher at Carnegie Mellon University and in downtown Pittsburgh. I interviewed her outside her market on October 21. I was interested in the types of customers her market catered to, her opinions on the automation of the grocery shopping process, and what place she thought mom-and-pop stores and interactions still had in a changing world. The interview was semi-structured, and I took some contextual notes on the checkout process at her market inside.

A.2 Think aloud sessions

- U4 is a 26-year old, female graduate student at Carnegie Mellon University. She uses the self-checkout most of the time, unless she decides the line is too long. She visits Giant Eagle about every other week.

- U5 is a 25-year old, male graduate student at Carnegie Mellon University. He uses the self-checkout on occasion, and made a note that he buys a small set of fairly

regular produce items, so he would “like [the favorites feature] a lot.”

- U6 is a 24-year old, male graduate student at Carnegie Mellon University. He uses the self-checkout on occasion, but he also noted that he prefers regular cashier lanes because someone is there to bag his goods.

B Interview Transcripts

(Omitted for web)

C Consolidated Models

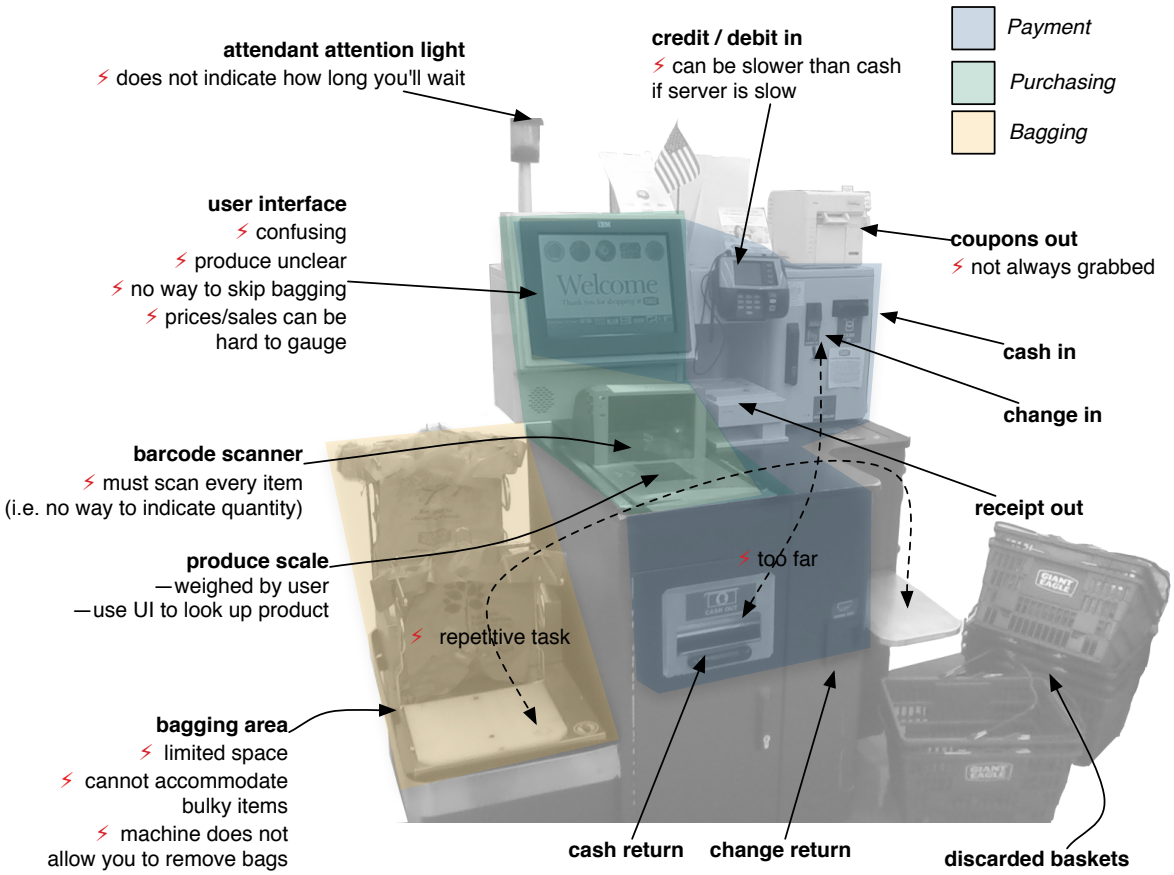


Figure 3: The consolidated physical model for self-checkouts.

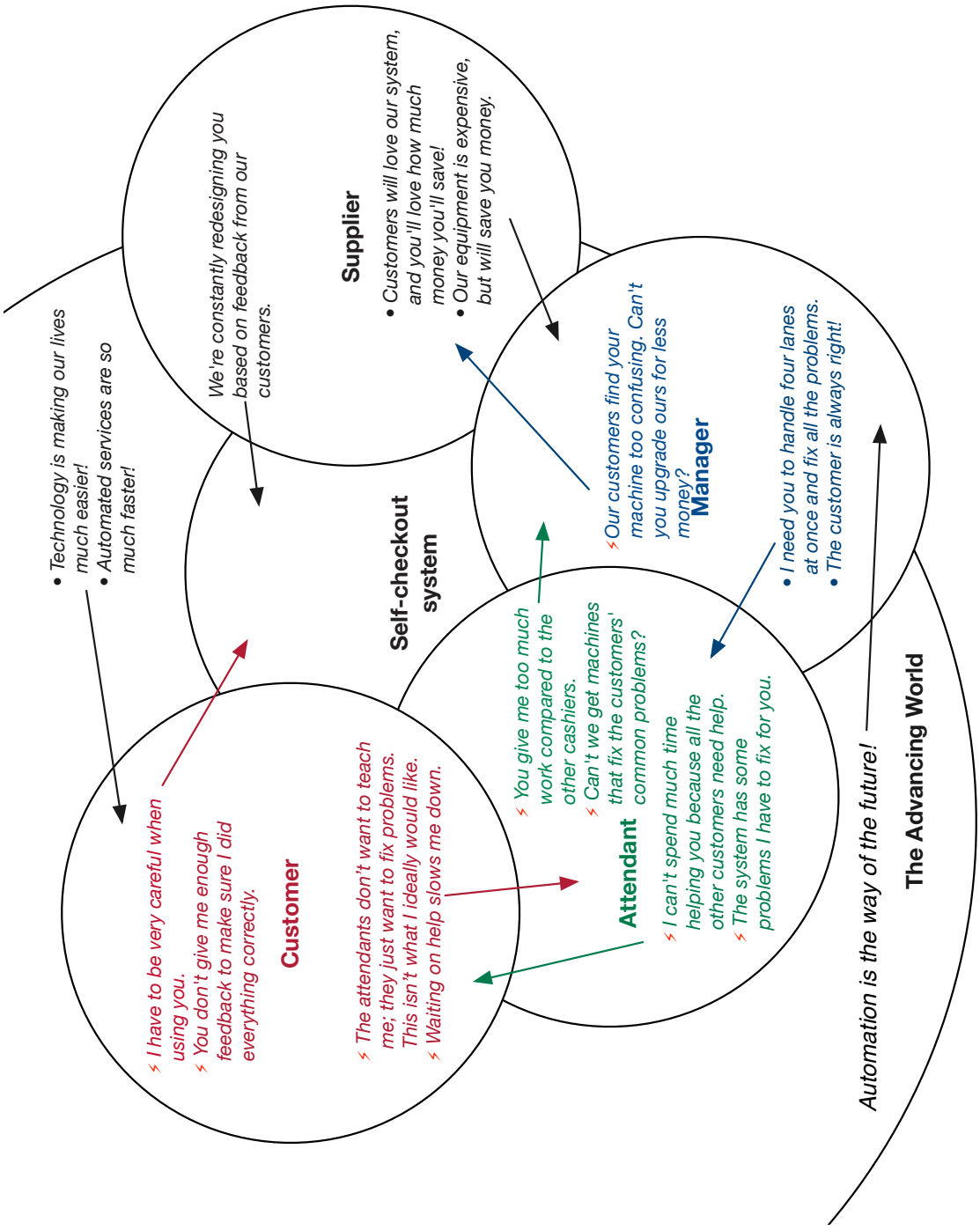
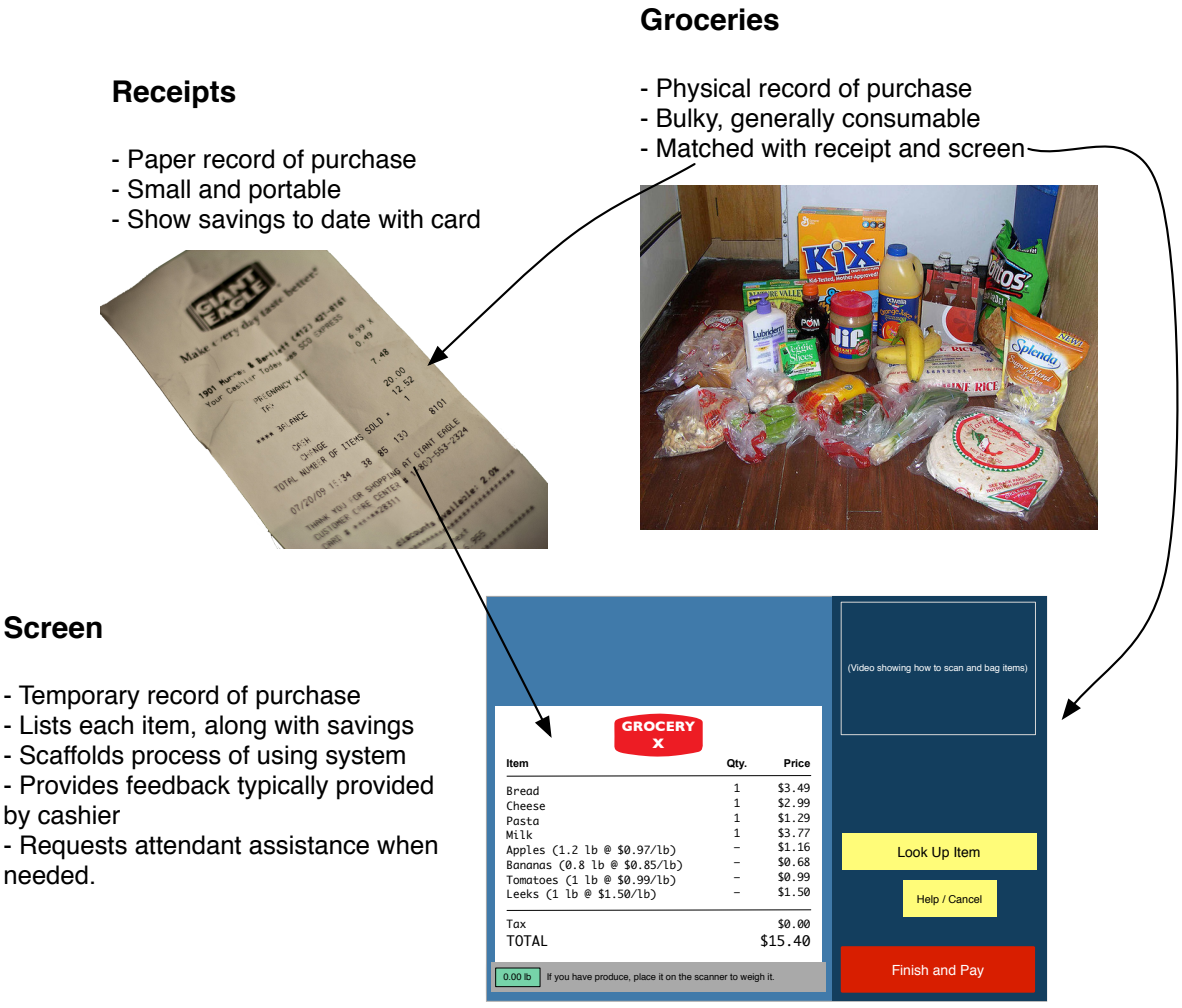


Figure 4: The consolidated cultural model for self-checkouts.



⚡ No clear association between price and grocery item
⚡ No way to request help from an attendant
⚡ Offers error messages that do not fully describe errors

Figure 5: The consolidated artifact model for self-checkouts.

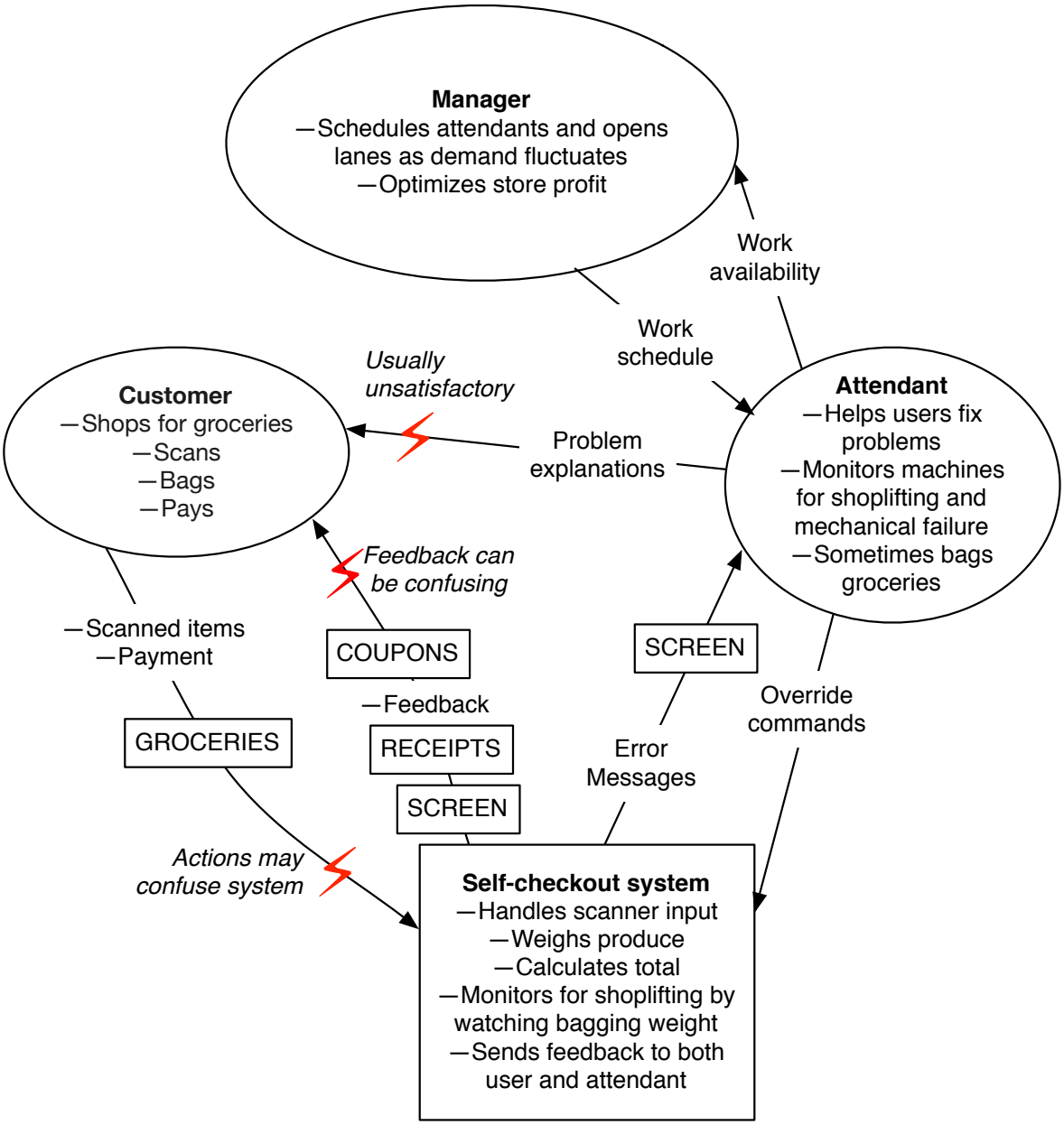


Figure 6: The consolidated communication flow model for self-checkouts.

Activity	Intent	Abstract	U1	U2	U3
Identify myself	Tell the service provider who I am	Trigger: Prompted to scan card	Scans card	Scans card	Moves to counter
For each item					
Record price	Purchase each item	Find UPC code or price tag	Scan item	Scan item	Add price sticker to calculator ⚡ Sometimes sticker is missing
Bag item	Store each item for transport	Move item from counter to bag	Place item in bagging area	Place item in bagging area ⚡ May not be room	Set aside for later bagging
Weigh item (if necessary)	Accurately pay for produce	Place item on scale	Place item on scale and select product with menu ⚡ Often confusing	Place item on scale and select product with menu ⚡ Often confusing	Places item on scale; uses calculator to record price
Pay	Exchange funds in order to acquire groceries	Use a payment method	Pay with card	Pay with cash ⚡ Sometimes has problems with card at SCOS	Wait for customer to produce payment method or record on family tab for later payment
Get receipt	Receive record of purchase	Grab printed receipt	Grab receipt from printer	Grab receipt from printer	Give receipt to customer

Table 1: The consolidated sequence model for self-checkouts.

D Affinity Diagram

My affinity diagram was constructed from notes extracted from my three interviews. An outline is given below.
(individual notes have been omitted for this web version)

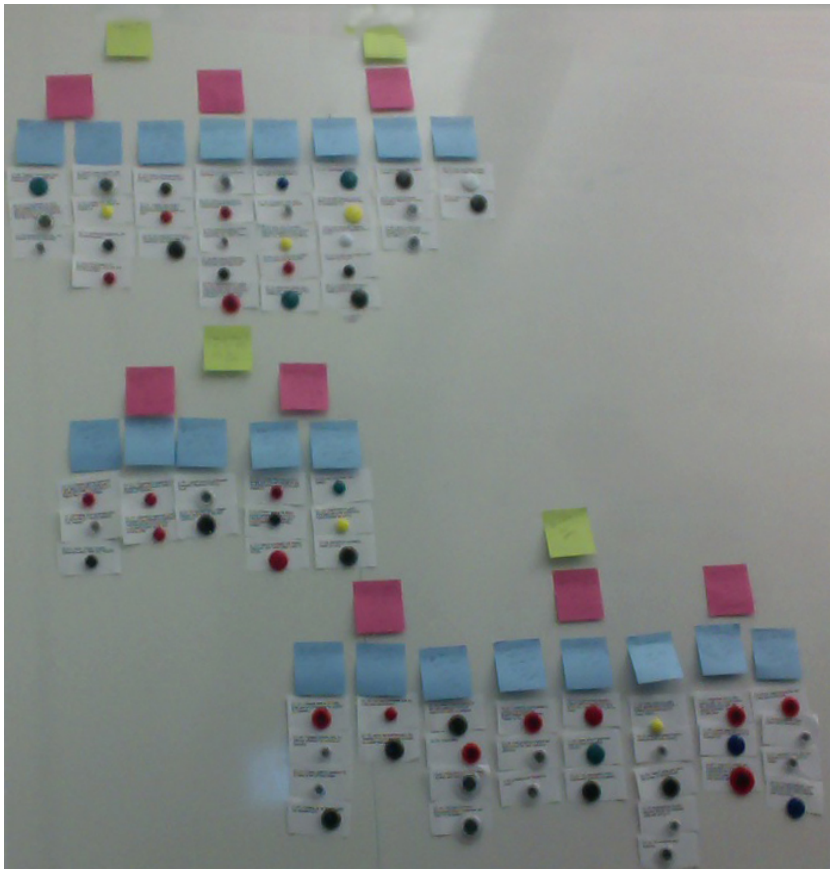


Figure 7: The affinity diagram, captured on a wall.

- Why I choose for or against the self-checkout system
  - Problems are too common in self-checkout system use for me to trust it with a lot of items.
    - I think that my inexperience with self-checkout systems leads to inevitable problems.
    - Waiting for the cashier is always worth it with a lot of items.
  - I like some parts of the system and it's often convenient.
    - My decision to use the self-checkout system is greatly influenced by my number of items and the line size.

        * I like these features of the self-checkout system.
        * Hypothetical self-checkout systems encourage shopping

- Uncertainties and problems
    - After finishing, I'm still not sure I did all the right things.
        * After the process, it's hard to tell if I checked out correctly.
        * I'm not sure how sales work at the self-checkout machine.
    - Because I'm uncertain how the self-checkout systems work, I have to be very careful.
        * The machine often reacts with unclear actions.
        * I have to be very careful at the self-checkout system.
        * I don't trust myself to not accidentally cheat the store or cheat myself.
    - Speed is important to me, and the self-checkout system is not always faster
        * A bad self-checkout system experience can ruin my trip.
        * Credit/debit cards are not necessarily faster.
        * I want to be done with shopping quickly.
- Specific problems encountered
    - Some of the problems stem from unfamiliarity with services normally done by cashiers or employees
        * Bagging is just not a pleasant process.
        * The machine doesn't indicate well where the weight area is.
        * Space is an issue, especially with a lot of bulky items.
- Attendant issues
    - The attendants don't want to teach me; they just want to fix problems. This isn't what I ideally would like.
        * Attendants can be unfriendly.
        * Small markets have advantages that Giant Eagle can't offer.
    - Waiting on help slows me down.
        * I wish there were more attendants.
        * I don't like waiting for the attendants.
        * The attendant only wants to fix problems for me, but I want him to teach me.

E Competitive Analysis

Although there is no major competition between suppliers of grocery self-checkout systems, I still felt it worthy to compare more widely-accepted self-service technologies to try to identify room for improvement.

	Grocery	Gas Pump	Airport Kiosk
Item limit How well is the system organized for large and small orders alike?			
Help availability How easily can I get help with my transaction?			
Time saved How much time do I save by using the self-service option?			
Confidence How easily can I be confident that I'm using the machine correctly?			
Extra work Does the machine save me from doing extra work compared to the traditional service option?			
Variety of payment options How much support is provided for me paying in multiple ways?			—
Fun How much of the self-service design makes it fun to use?			

It quickly becomes apparent that it's very difficult to compare competitors in disparate domains, because there are not many common features of self-service. As such, none of the observations from this method were used to inform my prototypical design.

F Design Prototype

F.1 Original vision

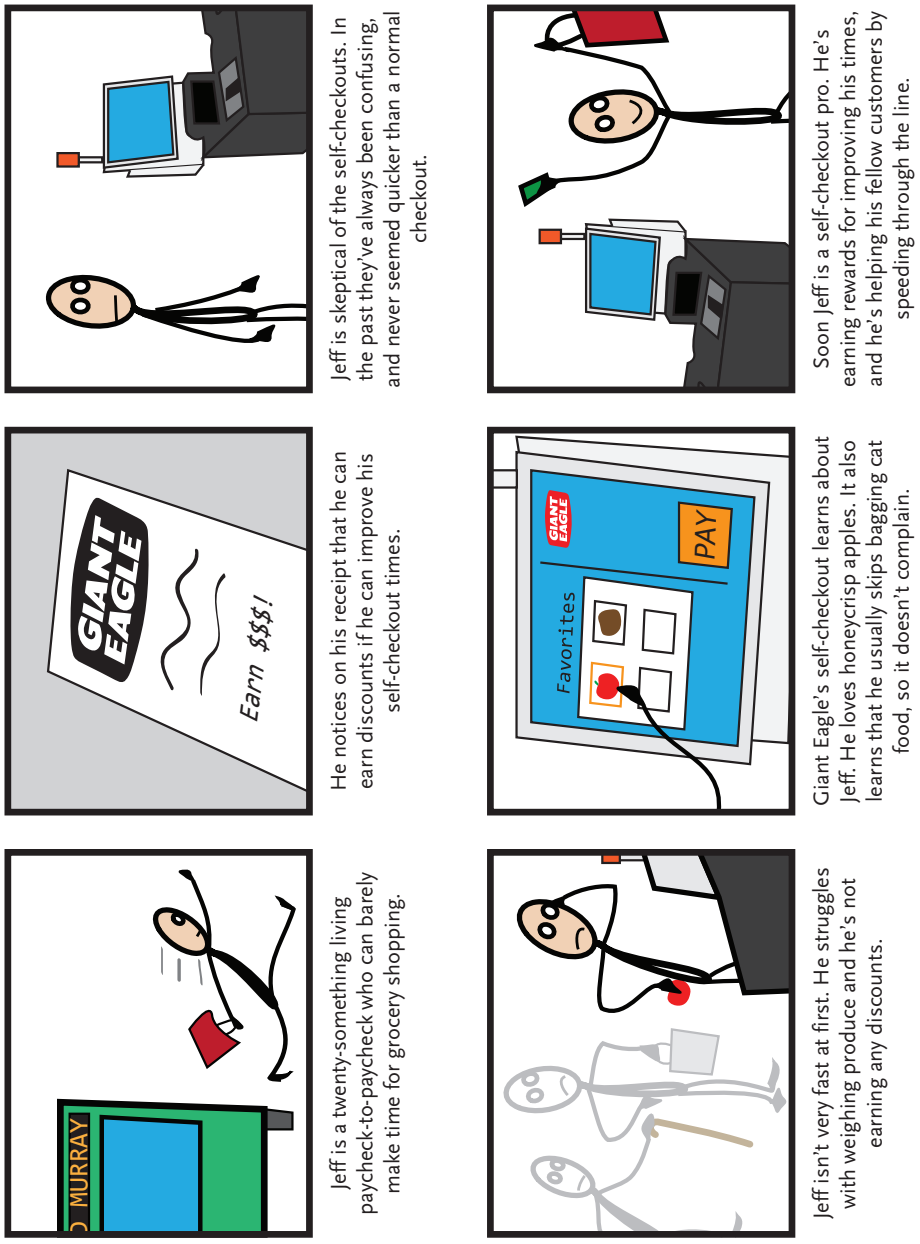
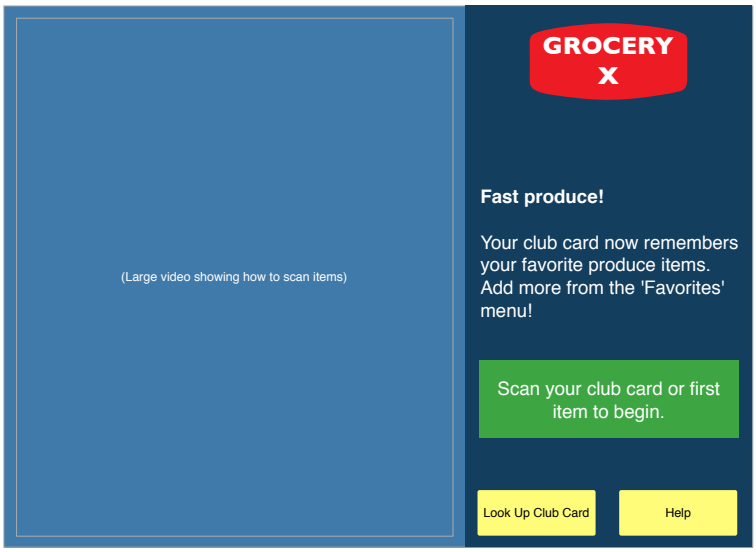
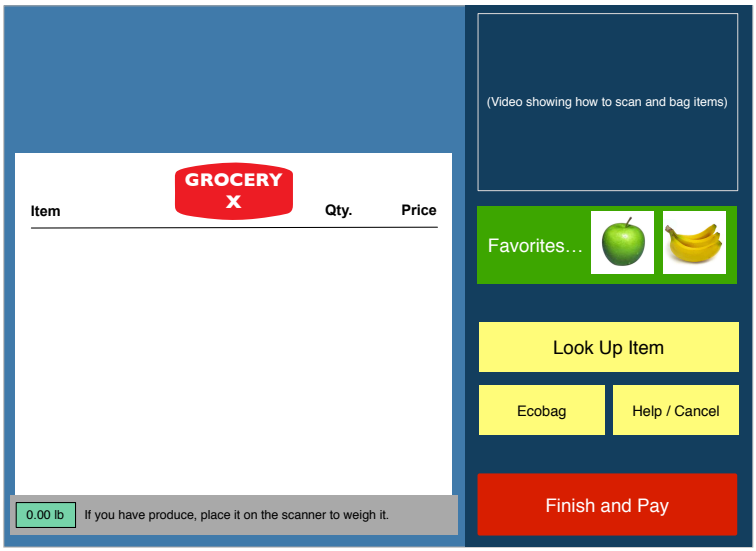


Figure 8: The original visioning scenario.

F.2 Final prototype design

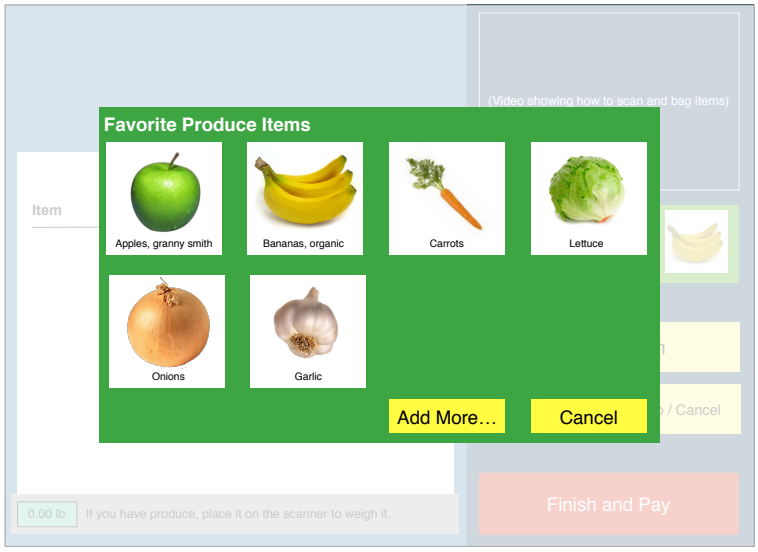


(a) The first screen

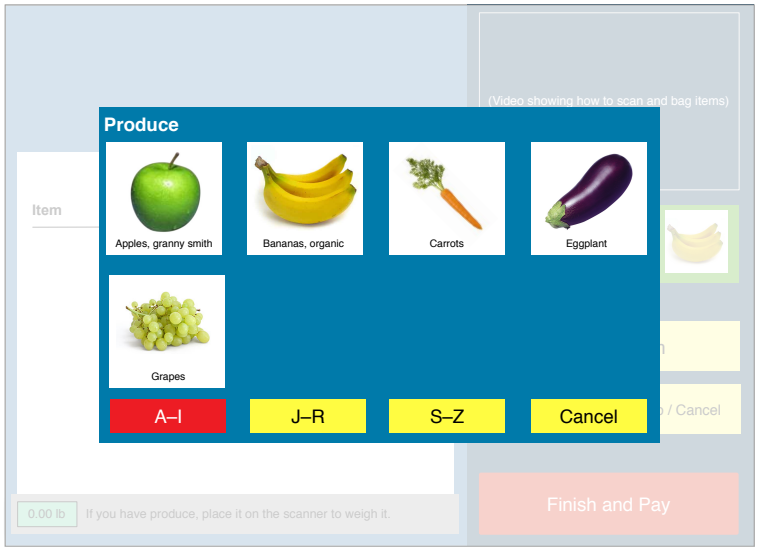


(b) Subsequent scanning screens

Figure 9: Prototype screens (1)

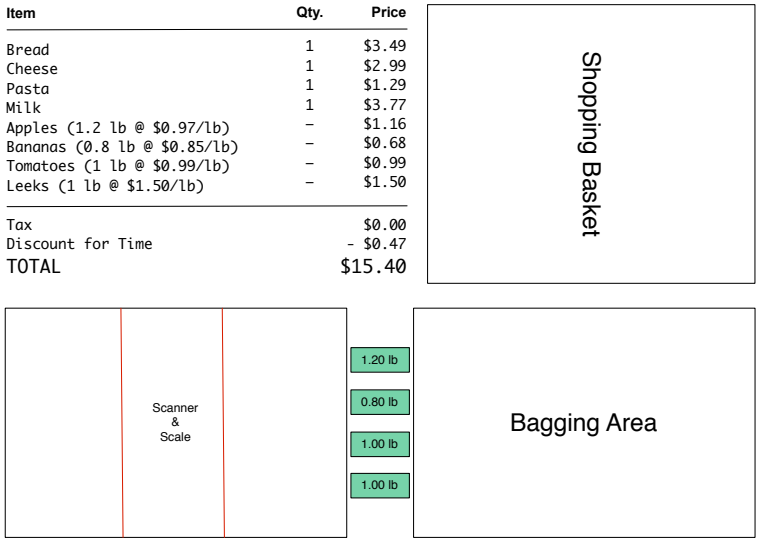


(a) The favorites menu in context

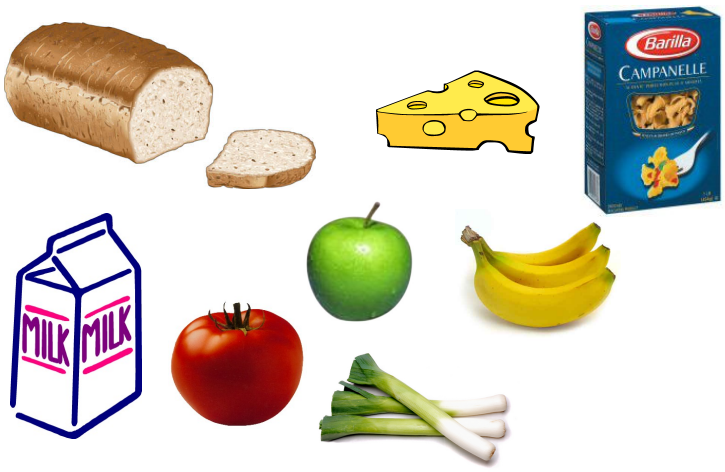


(b) The main lookup menu (there are two similar menus for other parts of the alphabet)

Figure 10: Prototype screens (2)



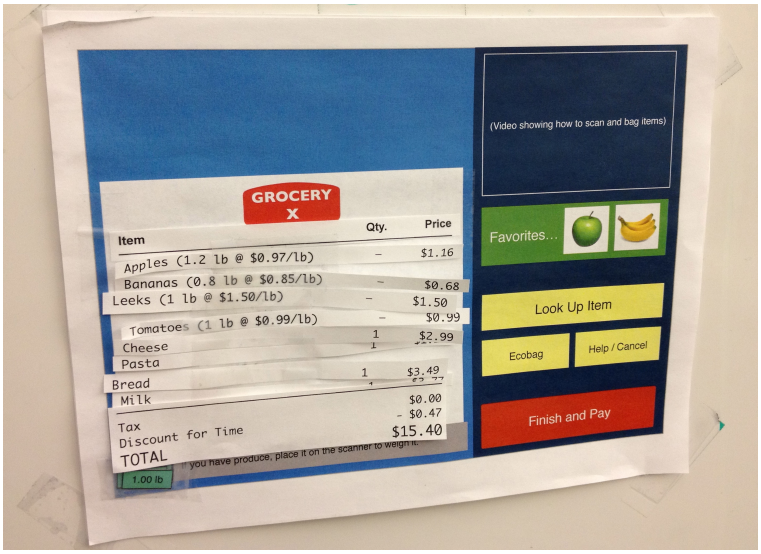
(a) Various paper elements used for the think aloud task



(b) The paper elements cut out to represent groceries

Figure 11: Prototype screens (3)

(a) The entire physical prototype setup



(b) The final screen after the task is complete

Figure 12: Prototype screens (4)

G Think Aloud UARs

ID	Kind	Name
kem-TA-01	Good	Helpful directions on how to scan produce
kem-TA-02	Good	Found favorites menu
kem-TA-03	Problem	Unsure how to select favorites
kem-TA-04	Problem	No club card feedback
kem-TA-05	Problem	No video tutorial for novices
kem-TA-06	Good	Likes the favorites menu
kem-TA-07	Problem	No feedback on running total
kem-TA-08	Problem	Are favorites store-wide or customer-centric?
kem-TA-09	Problem	Can I change favorites?
kem-TA-10	Problem	What does ‘Ecobag’ do?

Table 2: Problems and good aspects reported during the think-aloud sessions.

G.1 UARs from U4

ID

kem-TA-01

Good Aspect

Name

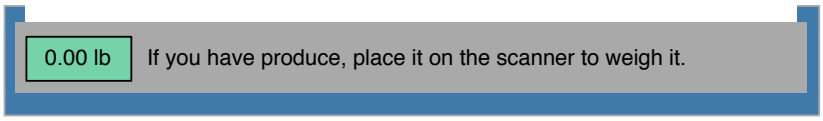
Helpful directions on how to scan produce

Rating

N/A

Evidence

The user indicated she followed the on-screen instructions pictured below to understand how to scan her produce.



Explanation

This meets the think aloud criteria where the user expresses some positive affect about the interface. She wasn't sure, even as an experienced user, how to begin scanning produce, so the interface helped her understand.

Justification for Rating

N/A

Possible solution and/or tradeoffs

N/A

Relationship

—

ID

kem-TA-02

Good Aspect

Name

Found favorites menu

Rating

N/A

Evidence

The user said “I see that I have favorites, so I’m going to click on favorites” when she began looking for the produce item she was scanning.

Explanation

Here the user expressed happy surprise that she didn’t have to use the traditionally cluttered lookup menus to find her bananas, which she spotted in her favorites menu.

Justification for Rating

N/A

Possible solution and/or tradeoffs

N/A

Relationship

TA-06 Likes the favorites menu

ID

kem-TA-03

Problem

Name

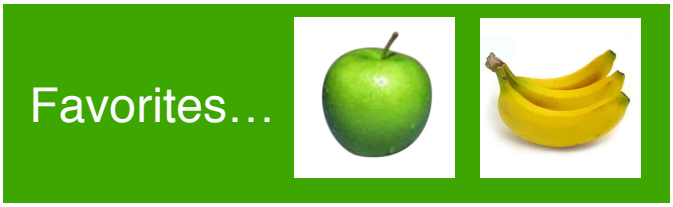
Unsure how to select favorites

Rating

3 (Major)

Evidence

The user indicated she was unsure if she needed to click on “Favorites. . . ” or on the pictured produce items themselves to select them, as indicated below.



Explanation

Here the user made both a design suggestion (make the produce images look more like buttons) and indicated confusion.

Justification for Rating

Since this prototype is largely about the implementation of the favorites menu, any comments and design suggestions on it are important. This could be a problem with experts and novices alike, so a solution should be reached.

Possible solution and/or tradeoffs

As suggested by the user, making the produce items look more like buttons by rounding the corners and adding a bevel would help lead the user to realize they are directly selectable.

Relationship

TA-02: Found favorites menu

G.2 UARs from U5

ID

kem-TA-04

Problem

Name

No club card feedback

Rating

3 (Major)

Evidence

When examining her total receipt on screen, there was no indication she was receiving club card discount prices despite having scanned her club card.

Explanation

Here we have another design suggestion, and one which I consider a conceit of the paper prototype limitation. It was unclear for me how to paper prototype a system which allowed items to be scanned in any order that showed a running total.

Justification for Rating

Despite the prototype limitations, I definitely don't want to limit user feedback, especially when the printed receipt reflects per-item savings.

Possible solution and/or tradeoffs

Add per-item savings in red below each scanned item to show total price.

Relationship

TA-07 No feedback on running total

ID

kem-TA-05

Problem

Name

Video tutorial for novices

Rating

2 (Minor)

Evidence

After swiping their club card, a user should be given a video tutorial of how the system works (especially its new features) if they've never used it before.

Explanation

Another design suggestion, this reinforces the idea that the interface should change based on user history and comfort with the system.

Justification for Rating

I think video tutorials are great, but they might be too overwhelming when they involve too many subtasks. Users should first be instructed how to scan, then how to bag, then how to pay, etc. In this way we also speed up the user if they wish to skip tutorials on things they know how to do (like bag items).

Possible solution and/or tradeoffs

Work video tutorials into a higher fidelity prototype or final system.

Relationship

—

ID

kem-TA-06

Good Aspect

Name

Likes the favorites menu

Rating

N/A

Evidence

In a post-task question and answer, the user indicated she really liked the favorites menu and being able to quickly select produce without having to search for a product lookup code or image.

Explanation

This is another instance of the user expressing a positive feeling about a new feature, validating the context-aware ideas underpinning this prototype.

Justification for Rating

N/A

Possible solution and/or tradeoffs

N/A

Relationship

TA-02 Found favorites menu

ID

kem-TA-07

Problem

Name

No feedback on running total

Rating

3 (Major)

Evidence

While scanning items, the user noted that no part of the receipt listed his running total.

Explanation

Here the user is pointing out a negative aspect of the UI, and he is indicating he'd like more feedback

Justification for Rating

While I admit this is a difficulty in paper prototyping (no easy way to update a running total save manually calculating and writing it in after each item), this is a thought that probably permeates most users' thoughts, and it will persist through the entire transaction.

Possible solution and/or tradeoffs

Add a running total at the bottom of the receipt.

Relationship

TA-04 No club card feedback

ID

kem-TA-08

Problem

Name

Are favorites store-wide or customer-centric?

Rating

2 (Minor)

Evidence

While scanning items, the user noted he is unsure if his favorites represent the store or the machine's favorites or his personal favorites.

Explanation

The interface does not scaffold this save for the start screen, which does explain that they're customer-based.

Justification for Rating

This can be easily fixed by explaining favorites to the user the first time he or she scans his club card with a new system.

Possible solution and/or tradeoffs

Create a small tutorial showing how favorites work the first time a user scans his or her club card with the new system.

Relationship

TA-08 Can I change favorites?

ID

kem-TA-09

Problem

Name

Can I change favorites?

Rating

2 (Minor)

Evidence

While scanning items, the user wondered if there was a way to change his favorites menu.

Explanation

The interface allows for this, but it is not scaffolded by the main scanning screen. Only once a user selects the larger favorites menu do those options become clear.

Justification for Rating

This can be easily fixed by explaining favorites to the user the first time he or she scans his club card with a new system.

Possible solution and/or tradeoffs

Create a small tutorial showing how favorites work the first time a user scans his or her club card with the new system.

Relationship

TA-07 Are favorites store-wide or customer-centric?

G.3 UARs from U6

ID

kem-TA-10

Problem

Name

What does ‘Ecobag’ do?

Rating

2 (Minor)

Evidence

After completing the task, the user inquired as to what this button did, indicating he wasn’t sure.

Explanation

Here the user expressed confusion over the function of a button, indicating it also needs to be explained with more than just a keyword.

Justification for Rating

This can be easily fixed by explaining the new features of the system to the user the first time he or she scans his club card.

Possible solution and/or tradeoffs

Create a small ‘?’ for explaining this button.

Relationship

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