HCI - M1 Assignment (Summer 2021)

Claudia Schweiss
cschweiss3@gatech.edu

Abstract—In 1989 Peapod, one of the first grocery ecommerce companies in the US, first started accepting online orders for groceries.[1] But online grocery ordering was slow to catch on. Exactly 30 years later, in 2019, only 24% of grocery consumers in the US had ever purchased groceries online for delivery or pick up.[2] However, the COVID-19 Pandemic is changing the trajectory for grocery ecommerce. By the end of 2020 online grocery ordering doubled to 51%[2] (Appendix 7.1). Now retailers are trying to figure out how to keep up the momentum. This includes making big investments into the consumer experience of shopping for groceries online.[3] One of the most time-consuming steps of online grocery ordering for the consumer is compiling their virtual shopping cart with the items they want to purchase. This assignment will complete one cycle through the design life cycle for this task.

1 PROBLEM SPACE

Despite this recent boom, one has to ask why did it take 30 years and a pandemic for grocery ecommerce to take off? In a recent Forbes article[3] Jeremy Neren, Co-founder and CEO at Grocery Key, calls out several areas where grocery retailers have failed in the past and will need to improve if they want to retain the consumers they gained in 2020. Neren states,

> "With shoppers becoming more comfortable with online ordering, expect consumers' expectations to keep on rising as e-commerce becomes the norm. Grocery retailers will no longer get credit for simply having an e-commerce option; they'll need to offer a user experience that truly makes consumers' lives more convenient. **Building a 40- to 50-item e-commerce basket is simply not efficient enough on the average grocery e-commerce experience today**." (Neren, 2021)

With this insight in mind, this assignment will complete one cycle through the design life cycle for the task of compiling an online grocery cart. Needfinding exercises will pinpoint what segment of the target domain will be redesigned. However, initial research will focus on the home page of the Walmart grocery ordering web interface.

2 USER TYPES

There are two user types that will be targeted during needfinding:

2.1 Primary Grocery Shopper

This user is acting as the primary grocery shopper for the household. They typically have a large cart size and are responsible for meal planning for their household.

2.2 On Demand Grocery Shopper

This user is *not* acting as the primary grocery shopper for the household. They typically have a small cart size and are making purchases to fill an immediate need.

Note that an individual may switch between these two user types depending on their intent of their shopping trip that day. These user types will be further refined during needfinding.

Both of these user types will fit the following demographics or have the following characteristic:

- *Age:* This study will involve adults only (18+).
- *Gender:* This study will include both men and women.
- *Experience:* Both novice and expert users will be included in the study. Novice users have little to no experience ordering groceries online. Expert users regularly use online grocery ordering services.
- *Household incomes:* The study will include a range of household incomes.
- *Children:* The study will include households with and without children.
- Grocery responsibilities: This study will include individuals who are primarily responsible for grocery shopping for their household. The study will also include individuals who are *not* primarily responsible for grocery shopping for their household or who share this responsibility with someone else.

3 NEEDFINDING PLAN 1: NATURALISTIC OBSERVATION

One of the needfinding methods that will be leveraged in this research is naturalistic observation. The primary purpose of this naturalistic observation exercise is to observe how people approach grocery shopping in a brick and mortar store. From this we can gain a better understanding of how individuals approach grocery shopping in general. The learnings collected during naturalistic observation will be used to inform future surveys or interviews.

This naturalistic observation exercise will be conducted in the following way:

- *Subject being observed:* Grocery shoppers.
- *Location:* 3 different brick and mortar grocery stores in various neighborhoods of Cincinnati.
- *Time:* There will be 3 different observation periods. Observations will occur in 15-minute time segments at various time slots during the day.
- *What data will be gathered:* The intent of this exercise will be to start specific, then progress to more abstract conclusions. However, the following questions will serve as a starting point for observations:
    - Do shoppers appear to be following a planned route or randomly searching for items?
    - Are the shoppers using a grocery list to help them shop?
    - Do shoppers spend time inspecting items before adding them to their cart?
    - Are shoppers shopping alone or in groups?
    - Where is the first area of the store shoppers visit when they arrive?
    - Are there any similarities between the shoppers?

This needfinding exercise will serve to answer the following questions for the data inventory: Who are the users? What are their tasks and subtasks? What do they need? What is the context of their tasks?

With any needfinding method there is always the potential to encounter bias. For this naturalistic observation exercise the following potential bias have been identified and the following precautions will be put in place:

Table 1 — Potential Bias[4] for naturalistic observation exercise with precautions.

Bias	Description	Example	Precaution
Confirmation Bias	I may observe shoppers in the store shopping how I believe they will shop instead of how they actually shop.	I believe shoppers will start in the produce isle, so I unintentionally look for the shoppers heading to the produce isle first.	While observing look for signs that the I am wrong. I will take a partner and compare notes to confirm observations are not biased.
Clustering Illusion	I may overestimate the importance of small runs, streaks, or clusters in large samples of shoppers.	I see three shoppers in a row using a grocery list. Therefore, I believe all shoppers use grocery lists.	I will not make large conclusions off of small amount of data. If patterns do appear then I will seek more data.5
Stereotyping	I may expect a member of a group to have certain characteristics without having actual information about that individual.	I believe women are more organized than men, therefore I unintentionally look for women following a planned route and men randomly searching for items.	I will vary the subjects I observe by visiting different tiers of grocery store at different times in different neighborhood. I will stay vigilant to avoid stereotypical conclusions.

4 NEEDFINDING PLAN 2

Another needfinding method that will be leveraged in this research is analysis of existing product reviews. The primary purpose of this analysis is to capture what people like and dislike about grocery delivery. Also, what are common hacks, errors, or mistakes users are committing. The learnings collected during this analysis of these reviews will be used to inform future surveys, interviews, and prototypes.

This analysis of existing product reviews will be conducted in the following way:

- *Subject being observed:* Consumers who order groceries online.
- *Review sources:* Apple App Store Reviews and YouTube Review videos.
- *Companies included:* The top 3 groceries ecommerce companies – Walmart, Amazon, Kroger (See appendix 7.2)

- *How data will be gathered:* Using a random number generator, reviews will be randomly selected for analysis. For example, if the random number generator selects "6" then the 6th review in the list of reviews on the Apple App Store will be included in the analysis. The same process will be followed for YouTube videos. If the review does not speak to the task of compiling a grocery cart using the web interface, then the review will be skipped.
- *What data will be gathered:* While reviewing the reviews the following information will be gathered for analysis:
    - Why do shoppers use online grocery shopping?
    - What do shoppers like about grocery shopping online?
    - What do shoppers dislike about grocery shopping online?
    - What hacks or work arounds do shoppers employ while grocery shopping online? Where are their needs not being met?
    - How are the shoppers navigating within the online grocery interface or their choosing?
    - Are they shopping for groceries via an app or the web interface? Are they multitasking while adding items to their cart?

This needfinding exercise will serve to answer the following questions for the data inventory: Who are the users? What are the user's goals? What do they need? What are their tasks and subtasks? What is the context of their task?

With any needfinding method there is always the potential to encounter bias. For this analysis of existing product reviews the following potential bias have been identified and the following precautions will be put in place:

Table 2 — Potential Bias[4] for naturalistic observation exercise with precautions.

Bias	Description	Example	Precaution
Confirmation Bias	I may observe reviews in the reviews commenting how I believe they will feel instead of how they actually feel.	I believe shoppers will complain about the location of the search bar, so I unintentionally look for the reviewers complaining about the search bar.	While gathering data from the reviews I will look for signs that the I am wrong. I will randomly select the reviews to include in the study.
Voluntary Response Bias	I may find that more opinionated people tend to leave reviews and that these reviews tend to be extreme.	I only see reviews from people who absolutely love online grocery shopping or hate it.	I confirm any extreme conclusions via other need-finding methods such as interviews.
Bandwagon Effect	I may find that the reviewers have the tendency to have a certain opinion because many other reviewers share the same opinion.	I may find a reviewer who may not have complained about the search bar except they heard another reviewer complaining about it so now they are too.	This may be especially true on social media, so I will include reviewers with various amounts of followers. Also, I confirm any extreme conclusions via other needfinding methods.

5 NEEDFINDING PLAN 3

Another needfinding method that will be leveraged in this research is surveys. The primary purpose of these surveys is to understand more about consumers who do and do not use online grocery ordering. Also, what a typically grocery purchase is like for them. The learnings collected from these surveys will be used to inform future interviews and prototypes.

These surveys will be conducted in the following way:

- *Subject being observed:* Consumers who do and do not order groceries online.
- *Survey participant sources:* HCI students, friends, family, Facebook groups
- *How data will be gathered:* Using the Georgia Tech Peer Survey system

- *What data will be gathered:* The survey will touch on the following topics. Questions will be finalized from learnings gained in the first two needfinding exercises.
    - Have survey participants tried online grocery shopping? Why or why not?
    - If survey participants have tried online grocery shopping, what was their favorite thing about it? What was their biggest complaint?
    - How do survey participants plan their grocery shopping? Do they create a list or random select items as they go?
    - From what businesses do survey participants buy their groceries?

This needfinding exercise will serve to answer the following questions for the data inventory: Who are the users? Where are the users? What are the user's goals? What do they need?

With any needfinding method there is always the potential to encounter bias. For these surveys the following potential bias have been identified and the following precautions will be put in place:

Table 3 — Potential Bias[4] for naturalistic observation exercise with precautions.

Bias	Description	Example	Precaution
Observer Bias	I may bias the survey participants by the way I phrase questions on the survey.	If ask the question "Why do you love saving hours of time using grocery delivery?" I could bias the survey participants to talk about the time they save.	I will have someone other than myself review my survey questions for biasing language.
Voluntary Response Bias	I may find that more opinionated people tend to take voluntary surveys and that their survey results tend to be extreme.	I only see responses from people who absolutely hate online grocery shopping.	I confirm any extreme conclusions via other needfinding methods such as interviews.

Bias	Description	Example	Precaution
Recall Bias	I may find that survey participants are not good at recalling how they felt about something that occurred in the past.	I may find that if someone tried online grocery shopping over a year ago they may struggle to remember what they liked or disliked about it.	I will encourage survey participants to take the survey shortly after completing an online grocery order. I will flag surveys where it has been 6 months since their last online grocery order.

6 REFERENCES

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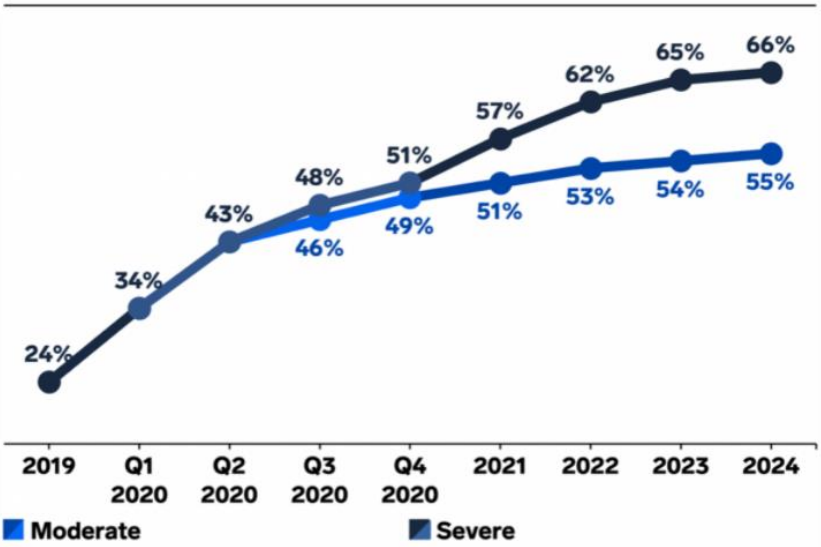
7 APPENDICES

7.1 US Online Grocery Penetration Forecast



Note: Penetration is defined as percent of consumers who have ever purchased groceries online for delivery or pickup. The moderate case considers if the pandemic subsides during Q3 2020, while the severe case looks at if concerns persist until there is a vaccine in 2021 or 2022.
Source: Business Insider Intelligence estimates, Business Insider Intelligence "Coronavirus Consumer Study," Coresight Research, Bain & Company, Brick Meets Click

Figure 1 — US Online Grocery Penetration Forecast[2]

7.2 Top 10 Digital Retailers, Ranked by US Retail Ecommerce Grocery Sales, 2018

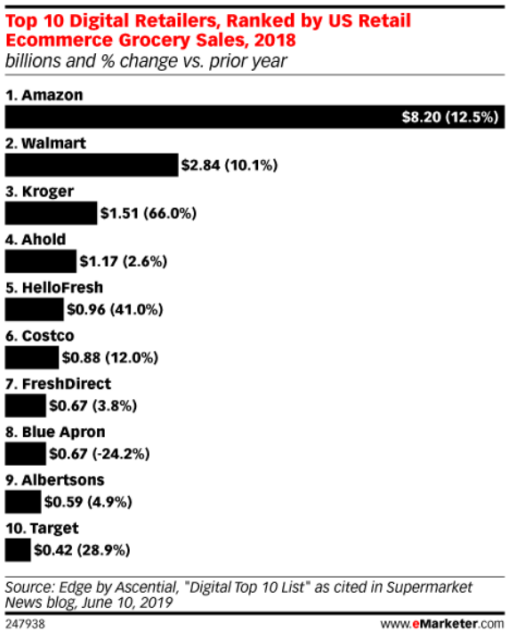


Figure 2 — Top 10 Digital Retailers, 2018[6]