Analyzing Food & Grocery Consumption Habits and their Impact on Technology during the COVID-19 Pandemic

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

A means to communicate with others, a means to store and find information about anything and everything, a resource that only continues to grow in its usage during our lives, technology has been growing rapidly over the past 30 years, and there is seemingly no limit to its capabilities in sight. The COVID-19 pandemic has only increased the rate at which technology is being used in our daily lives, but where did this drastic change come from? Companies like Amazon, GrubHub, Ebay, and Walmart have been around for more than a decade but over the course of this pandemic the usage of these companies has drastically increased. For Amazon specifically, this is exemplified in their Revenue, Profit/Loss, and EPS reports (shown below in Figure 1) from the end of 2019 and all of 2020 (Long, 2021):

Figure 1: Amazon 2019 and 2020 Business Statistics
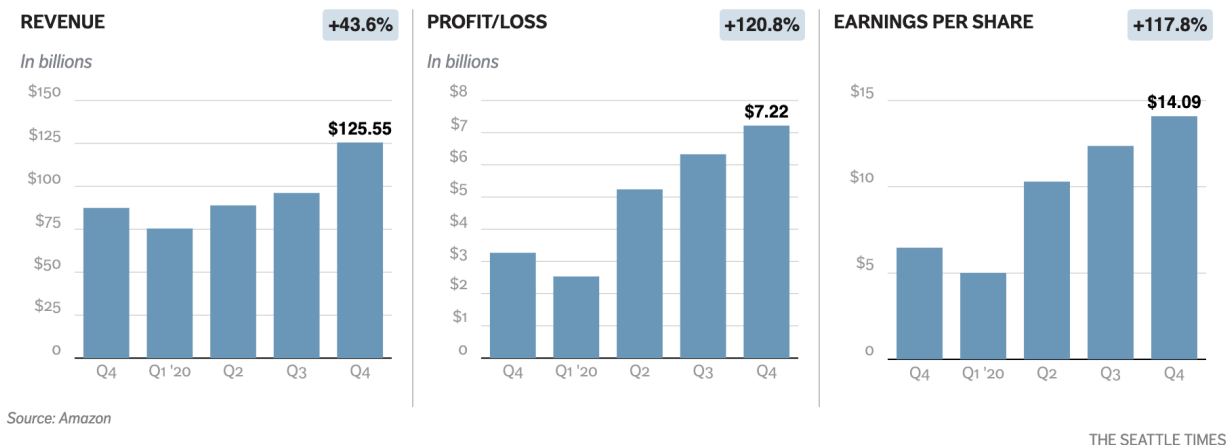
As we can see from Figure 1, Amazon's revenues and profits skyrocketed once the COVID-19 pandemic hit, as more and more shoppers began using Amazon retail for their needs.

In addition to this, almost every restaurant or grocery store either has their own shopping application or uses a third-party application in order to help customers shop from their business. DigitalCommerce360 reported that digital commerce was up 44% in 2020, more than triple its

growth from 2019 (Ali, 20201), meaning that not only are more and more people shopping online but there are many more available means to shop online. These means include: mobile applications so consumers can more easily shop-on-the-go, online infrastructure which is used not only internally by the businesses but by the consumer for easier-ordering, and more convenient order/delivery tracking. I would argue, as would many others, that this rise in various forms of digital commerce is a direct result of the COVID-19 pandemic which "began" March of 2020, however, that begs the question of how will this digital commerce growth translate into the post-pandemic world. It is understandable that many shoppers will have grown comfortable to either curbside pick-up from grocery stores or even just online shopping in general, but how many of those people will return to purely in-person shopping? Throughout this paper I will be analyzing how consumer sentiment resulted in the increase in technological resources made available by grocery stores and restaurants, and how consumer behavior will impact the use and deployment of these new mobile applications, online and internal infrastructure, and delivery resources in the post-COVID era.

Social Construction of Technology

This analysis is conducted through the lenses of the Social Construction of Technology framework which argues that technological innovation is a complex process of co-construction in which technology and society, to the degree that they could even be conceived separately of one another, negotiate the meaning of new technological artifacts, alter technology through resistance, and construct social and technological frames-of-thought, practices and action (STS Wiki, 2018).

Further delving into the Social Construction of Technology framework, we find that its main definition is derived from the fact that human beings dictate what type of technology is

innovated. Wiebe Bijker and Trevor Pinch (Wiki, 2020), two distinguished professors of Social Technology Sciences, came up with this theory which aimed to contradict the traditional theory that technology influences social behaviors. Within this theory, Bijker and Pinch point out that in order to understand the reasons for acceptance or rejection of a technology should look to the social world (Wikipedia, 2020). It is not the "best" technology that influences society but yet the best technology that exists is the one whose formation is due to human actions. This makes sense in today's society, as the most influential pieces of technology are those that constantly take in feedback from their consumers and understand how to make their product more consumer friendly. This correlation between the existence of a technological entity and consumer behavior and sentiment towards that technology is the exact relationship which I want to examine when it comes to shopping habits and the new technology being implemented by businesses in an effort to supply an instrument for consumers to shop through.

The Stakeholders

The main stakeholders involved in the post-COVID food and beverage industry can be broken up into two major categories: consumers and businesses. The businesses can be further designated into two types of companies: companies that actually supply the food (we will refer to these companies as Suppliers) and beverages to consumers and the companies that use technology to make accessing food and beverage organizations easier— we will refer to *these* companies as Providers. There are some companies that act as both a Supplier and a Provider, as they both *provide* an online platform in order to present products and services to consumers in addition to *supplying* them with the actual food and beverage — these companies will be further discussed later on in this paper. While it is also apparent that notable Providers existed and
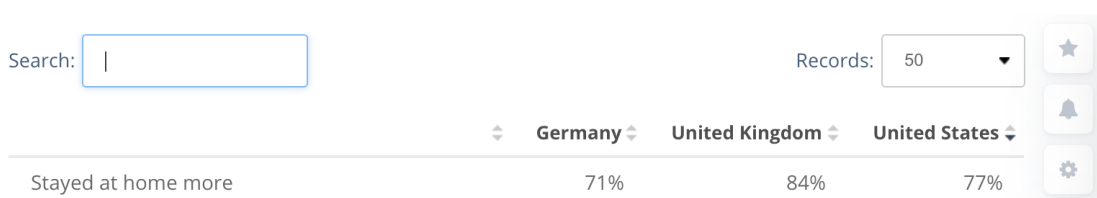
prospered years before this pandemic had begun, I will argue that the impact that these Providers have on society has drastically changed and will continue to adapt to consumer sentiment.

      For the consumers, while not all consumers are responsible for their own shopping — one person may shop for multiple people — each person is independently reliant on the food and beverage product — as it is essential for survival. This leads me into my discussion as to how the circumstances surrounding the *ability* to obtain this product— food and beverages — drastically changed during the Coronavirus pandemic, and how that change not only resulted in how frequently Suppliers and Providers interact with one another, but drastically increased the frequency of those interactions.

Coronavirus Background Information

      As a brief context before delving into the entire relationship between consumer behaviors and business actions taken during the COVID-19 pandemic, as it is important to discuss the nationwide circumstance and public perception of the virus before delving into the technological ramifications, there was a lot of fear about the unknown with regards to the Coronavirus. Some of these sentiments are embodied in the following findings by Kaiser Family Foundation during a March 2020 survey: "Four in ten say their life has been disrupted "a lot" or "some" as a result of the coronavirus outbreak, and many worry that they or someone in their family will get sick (62%), that their retirement or college savings will be negatively impacted (51%), or that they won't be able to afford testing or treatment for coronavirus if they need it (36%)." (Lopes & Hamel, 2020). These numbers by Lopes & Hamel correspond to the changed lifestyle of many average consumers, with these percentages being shown in Figure 2 below:

Figure 2: May 2020 Consumer Statistics (Statista, 2020)

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|	⬍	Germany ⬍	United Kingdom ⬍	United States ⬍	
Stayed at home more		71%	84%	77%	

The major takeaways from Figure 1 above include how 52% of those surveyed in the United States shopped online more, 35% avoided shopping at certain times, and 62% shopped less altogether. Now, this was only 2 months after the pandemic had really begun in the United States, and only 5% of people surveyed (Statista, 2020) had not made any changes to their lifestyle.

The Impact on Suppliers

Now what does this mean from the perspective of a grocery store or restaurant? Well not only had the number of people coming into these businesses declined, but some of the businesses new COVID regulations prohibited indoor dining until more information was available regarding the virus. This led to major declines in revenues of restaurants, as many were not able to compensate for loss in in-person dining with takeout orders; data regarding New York restaurants' decline in revenue is shown below in Figure 3, and can be used as a case study for this particular discussion:

Figure 3: New York Restaurant Revenues (Dixon, 2020)
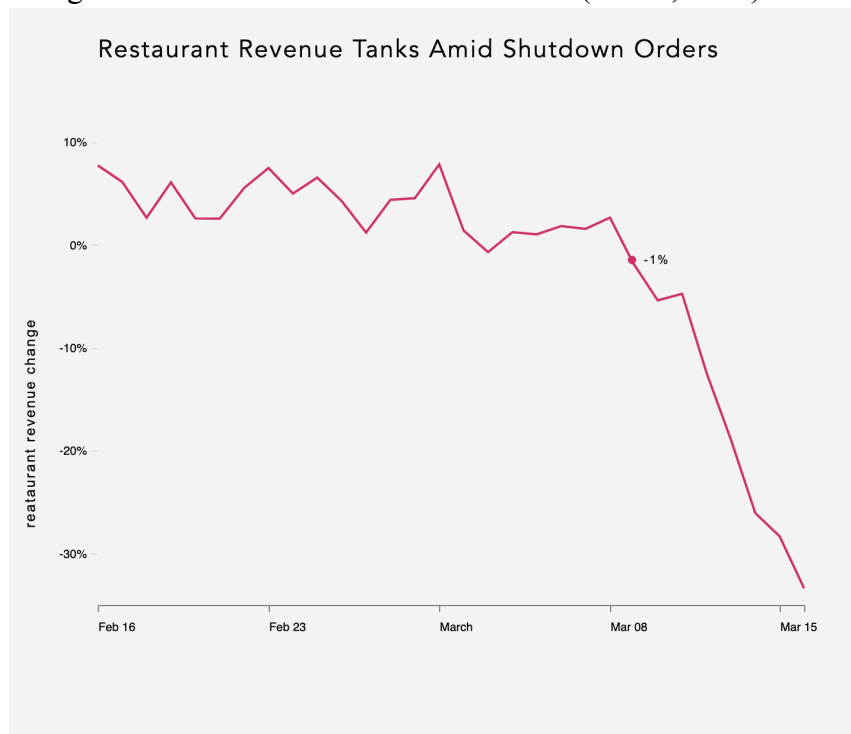
This decline in revenues is due to the fact that people were so uncomfortable with going to restaurants in person as it was deemed unsafe and a potential "exposure location" for the virus, as said in a report from the CDC in September 2020 (CDC, 2020): "Exposures and activities where mask use and social distancing are difficult to maintain, including going to places that offer on-site eating or drinking, might be important risk factors for acquiring COVID-19." This not only led to a 54% decline in daily restaurant connections (Dixon, 2020) — a restaurant connection as being defined from an order or any interaction with a restaurant— but the restaurants that did maintain business were all available through some online resource. This showcases that in order for a Supplier of food and beverage to stay afloat restaurants had to become their own Provider and be responsible for their own technological products so as to make consumers more comfortable. For restaurants that were unable to reach out through technological means to their customers, they ended up going out of business.

This restaurant trend correlated with a similar trend when it came to grocery shopping, as grocery app downloads skyrocketed in unison with restaurant revenues declining (Figure 4):

Figure 4: Grocery App Downloads Growth during Pandemic

Grocery App Downloads Spike After Pandemic Declared
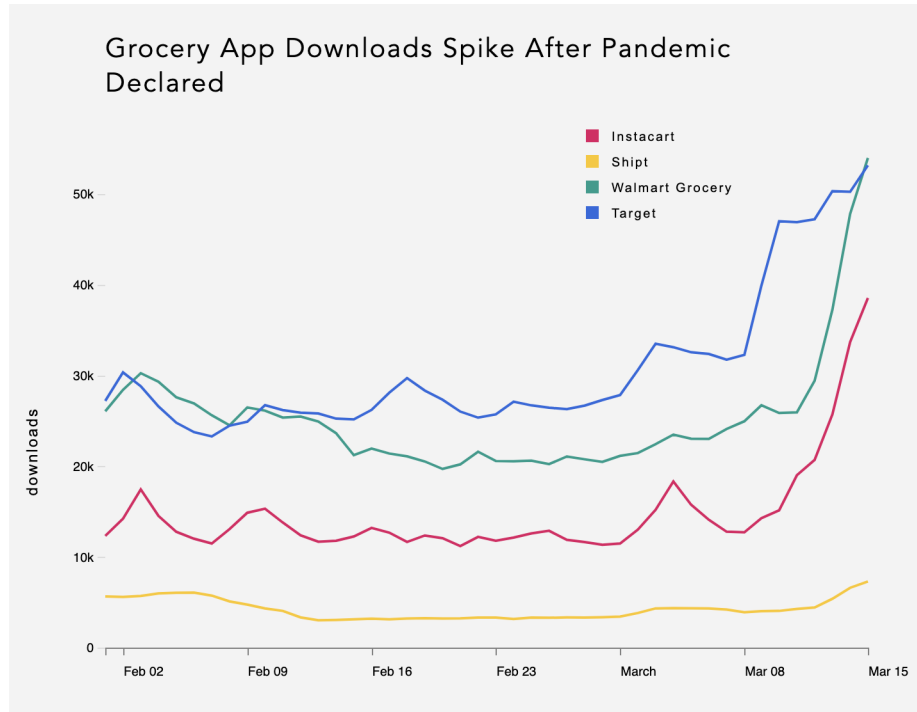
This gave a strong indication to restaurants and grocery stores alike that in order to stay in business, they would have to create and maintain some sort of web or smartphone application to help their customers feel the most comfortable. This also presented an opportunity to third-party businesses like GrubHub, DoorDash, and Uber Eats that were built upon providing online services to restaurants, as both Suppliers and Providers began to see how consumption habits were changing due to Coronavirus.

Circling Back

This brings me back to my earlier definition of the Social Construction of Technology framework, as so often it appears that technology changes peoples habits, i.e. social media changing people's usage of their phones, television changing the way sports and news are shared, and many other creations. But as soon as the coronavirus pandemic began, shoppers dictated which businesses thrived and which ones were forced to close, purely due to their comfort with

that restaurant or grocery store. Not only can this be clearly observed in the figures above — in terms of economic behavior the first few weeks after the pandemic had begun — but it can be more so observed in how these restaurants and grocery stores changed how they were serving their customers. For one thing, restaurants that were unable to accommodate takeout orders were among the 40% that closed due to COVID (Dixon, 2020) leaving the door open for services that were better able to accommodate their consumers needs, and what better way to accommodate than making your services available through easy-to-use consumer-facing technology.

Two specific pieces of technology that were further utilized post-March 2020 were restaurant and grocery store specific mobile apps and third-party food and grocery delivery apps. The difference between these two pieces of technology is that some restaurants/grocery stores actually poured more of their resources into creating their own consumer-facing application, as companies like Chipotle, Cava, Harris Teeter, Target, Walmart, and others all wanted to give customers the best personalized experience of shopping with their business. Walmart is actually a perfect case study for these businesses, as majority of their revenues pre-pandemic were from in-person shopping, however during the pandemic, Walmart's grocery pickup service, a limited option before the pandemic, was been extended to more Walmart stores with more time slots and pickup spots. Express delivery and contactless pickup also became available so that each and every customer was comfortable with Walmart's service (Cheapism, 2020). This rapid adoption of technology allowed them to outperform competitors who did not adapt the technology as fast or at all, as Walmart and Target actually *increased* profits during the beginning of the pandemic due to customers' comfort with their services (Friedman, 2020).

In addition to this, for restaurants who did not have the resources to make such drastic store changes and build their own application, they were able to turn to companies such as

GrubHub, Uber Eats, and InstaCart to help them maintain their business. This trend is apparent through the revenue growth of Grubhub, as they reported a 39% increase in revenues over the course of 2020 (Grubhub, 2021) almost completely due to the pandemic. These revenue increases were due to both the increase of food delivery during the pandemic and the increase in participating restaurants on Grubhub (Beckett, 2020) as it allowed Grubhub to offer more restaurant options to their customers.

Summing up the Pandemic

The Social Construction of Technology framework explicitly depicts a scenario where consumer sentiment and behaviors directly correlate with the way technology is innovated and utilized (STS Wiki, 2020), and this has been observed throughout the Coronavirus pandemic. The bond between Suppliers and Providers has never been more intertwined, as people not only need their food and beverages but they want to ensure that they are being safe in the way they are obtaining it, and this is due to the fear surrounding Coronavirus. This change in consumer behavior has led to dramatic spikes when it comes to the usage of grocery, restaurant, and third-party applications, as it is a means to obtain wanted goods while mitigating the risk of being exposed to Coronavirus. While online ordering and delivery has been an option for people since 2015, the timing between the spike of its usage and increased availability and Coronavirus is beyond coincidental, as it is observable through previous findings in this report that one had a direct affect on the other. The only question remaining is what will the world of food and beverage consumption look like after the pandemic has ceased to have an impact on people's lives.

What will the Future Look Like?

It is clear that the technological infrastructure of food and beverage businesses has drastically changed since the beginning of the Coronavirus pandemic, however, how will this infrastructure be utilized after the fear of the virus has dissipated? By the end of the pandemic it is anticipated that most of the businesses that were able to survive would be due to their ability to replace lost in-person business with increased online ordering and delivery. Thus, it is assumed that these Suppliers will have an existing partnership with a Provider or have their own application in place and the question then becomes will these pieces of technology continue to be utilized.

It is relevant to return to the other stakeholders besides just the consumers in this upcoming scenario due to the fact that people running both the Supplier and Provider side of the grocery store and restaurant businesses will want to have the most efficient and profitable business-plan going forward. The cost of developing one's own application is much less than the cost of using Grubhub or other third-party applications since those applications require commission fees and thus decrease the amount of revenue that goes directly to the Supplier. Standard fees for restaurants that use Grubhub— or applications similar to it— are a 20% service fee, a 10% delivery fee, and other smaller taxes and service charges (Get Grubhub, 2021). This amounts to a large portion of a restaurant's revenues and thus dissuade restaurants from doing business with these services in the long term. However, since it is expected that some people will continue to utilize technology in the post-pandemic era to receive food and beverages, it would not be surprising to see more and more restaurants develop their own applications so that they can act as their own Provider, instead of needing to rely on these third-party Providers. When reverting back to the consumer's perspective, this will still supply a resource for them to

purchase food from these restaurants, it would just be through independently run sites. Thus, adhering to Social Construction of Technology's theory (STS Wiki, 2020), social habits will dictate how much technology is utilized and progressed, due to the fact that if people are still hesitant to go into stores they will have the option to utilize these independent online applications (which will be further developed by restaurants to please their customers), and if not they are welcome to shop in the stores.

When it comes to the future of grocery shopping, the same sort of trend will follow suit: as Walmart (discussed earlier) has increased the availability of curbside pickup in addition to grocery delivery (Cheapism, 2020), depending on the sentiment of consumers with in store shopping these services will either continue to exist or will begin to decrease to compensate for less demand of those services. Thus, regardless of consumer sentiment going forward, the Social Construction of Technology framework will still pertain to the situation, even if it means that the technology widely implemented during the pandemic takes a backseat to old fashion consumer habits.

Closing Thoughts

Throughout this paper we have used the Social Construction of Technology framework to analyze how changes in consumer behaviors led to changes in how restaurants and grocery stores were operated. By examining the changes in consumer sentiment and shopping habits we were able to identify and observe how businesses increased their use of technology in their day-to-day activities— whether through third-party applications or their own — to comfort the everyday consumer and keep their business. Without this change in consumer behavior due to the pandemic this increased usage and prevalence of technology in the food and beverage industry may not have truly blossomed until years in the future.

Looking forward into the future it is uncertain how much technology will play a part in these businesses due to the fact that we don't yet know how consumer sentiment will change—will it revert back to pre-pandemic or will it stay similar to as it was during the pandemic? Regardless of this reality that we face in the coming months, one thing is certain: the food and beverage businesses that survived and perhaps prospered through this pandemic were ones that were able to quickly adapt to their consumers' needs and use technology to better comfort the everyday shopper. This growing connection between Suppliers and Providers of food and beverages will only continue to become more interesting as one entity can no longer exist without the other. The main question going forward is whether these entities will remain two independent services for a vast majority of Suppliers, or if these businesses will choose to integrate their own "Provider" technology into their organization to better serve the needs of their customers, in addition to ensuring that they aren't losing revenues to third-party organizations.

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