EXAMINING MODERN CUSTOMER EXPERIENCE TECHNOLOGIES AND THEIR DESIGN

CUSTOMER EXPERIENCE TECHNOLOGIES AND THE INFLUENCE OF RELEVANT SOCIAL GROUPS

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By
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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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The origins of the modern corporation can at least in part be traced back to 1876, when Alexander Graham Bell's invention of the telephone enabled timely and efficient remote interaction between producers and consumers for the first time, allowing companies to scale their enterprises far beyond the physical and geographical boundaries that had existed before. Since then, entrepreneurs and scientists alike have engaged in continuous technological innovation to attempt to improve how customers engage with the companies they purchase from, including the introduction of the toll-free telephone number by AT&T in 1967, the development of modern customer relationship management (CRM) technology in the 1980's, and most notably, the advent of the Internet (Gomez, 2021). The nature and quality of these customer interactions, and the perceptions that said customers have towards these interactions, is collectively known as "Customer Experience" (CX), a term which has been assigned an ever-increasing level of importance by many industry professionals in recent years (Batra, 2019, p. 138). As such, many companies are now turning to cutting edge CX technologies, such as AI chatbots and other conversational assistants, with one study showing that nearly three quarters of surveyed businesses listed measures like these as crucial to their CX strategy (Capgemini Research Institute, 2019). Many customers are embracing these changes as well, placing more trust in the ability of these new technologies to resolve their tickets with each passing year (Helpshift, 2019).

As these new CX tools and methodologies mature and continue to be deployed, our society must reckon with the new questions they pose, including how these tools should be designed to maximize effectiveness, who gets to determine what constitutes effectiveness, and the implications that these definitions have for relevant social groups. In the accompanying technical report, the current state of technological advancement in the field of CX will be discussed, along with an exploration of different design approaches to the implementation of

these advancements, including a design created for use by customer service representatives at Wayfair. The tightly coupled STS research project will in turn focus on the relationship between the aforementioned technological advancements and the social groups that interact with them, namely customers, customer service representatives, engineers, business owners, and CX logistics providers, among others. The interests of these social groups, and how said interests influence and are influenced by various CX technologies, will be examined through the lens of the Social Construction of Technology framework. By exploring the interactions between these technologies and relevant social groups, this STS paper aims to provide some insight into how recent technological advancements in the field of CX might change our roles as consumers for years to come. Both the technical and STS portions of this thesis will be completed by the end of the Spring 2022 semester.

EXAMINING MODERN CUSTOMER EXPERIENCE TECHNOLOGIES AND THEIR DESIGN

Over the past few decades, our society has witnessed the rise of many immensely successful megacorporations, the most prominent of which routinely generate a level of wealth never before seen in human history and operate at unprecedented scales. However, an unfortunate reality for these companies, and especially their customers, is the fact that even in this upper echelon of capitalist enterprise, many corporations struggle to ramp up the capabilities of their respective customer service departments to keep up with demand, forcing customers to wait in long hold queues (Weisbaum, 2016). These weaknesses were further exacerbated by the COVID-19 pandemic, which combined a sudden shuttering of call centers across the globe, a

drastic cutback in the availability of the customer service agents that remained, and a surge in consumers' need for assistance to create a perfect CX disaster (Kelly, 2020).

In order to tackle these logistical challenges of scale, resilience, dependability, and efficiency in customer service, companies and independent researchers have been developing many proposed solutions, drawing on customer-facing technologies such as self-service tools, chatbots, AI, and predictive analytics, as well as support-facing technologies such as intuitive customer service dashboards and softwares for scheduling, ticket organizing, and improved communication (Blum, 2020). Conventional wisdom among industry analysts and leaders indicates that AI, automation, big data, and machine learning will be crucial in cutting costs, improving customer satisfaction, and removing repetitive tasks from the customer experience pipeline (Cardona-Smits & Jacobs, 2021). However, definitive answers on where, how, and in what contexts these technologies should be deployed in this process continue to elude researchers and service providers, though it is clear that an ideal solution is one which successfully combines the best aspects of both humans and machines, offering an experience that is fast and efficient, while also being highly personalized and empathetic to the consumer (Khan & Iqbal, 2020, p. 590-591).

The objective of this technical report is to examine the current state of technological advancement in the field of CX, discussing various proposed solutions to the aforementioned challenges, how these technologies have been shown to interact with both customers and service agents in practice, and the potential impact of technologies that are still in development. To illustrate one such proposed solution, I will also be reflecting on the design of a dashboard I built for the Wayfair Financing customer service team during my internship in the summer of 2021, and how the inclusion of actual customer service representatives in the design process led to a

more streamlined design that enabled agents to see exactly what the customer saw when experiencing issues, as shown in Figure 1 on the next page. This report will be completed under the guidance of Daniel G. Graham, a professor in UVA's Computer Science department, and Rosanne Vrugtman, a lecturer in UVA's Computer Science department.

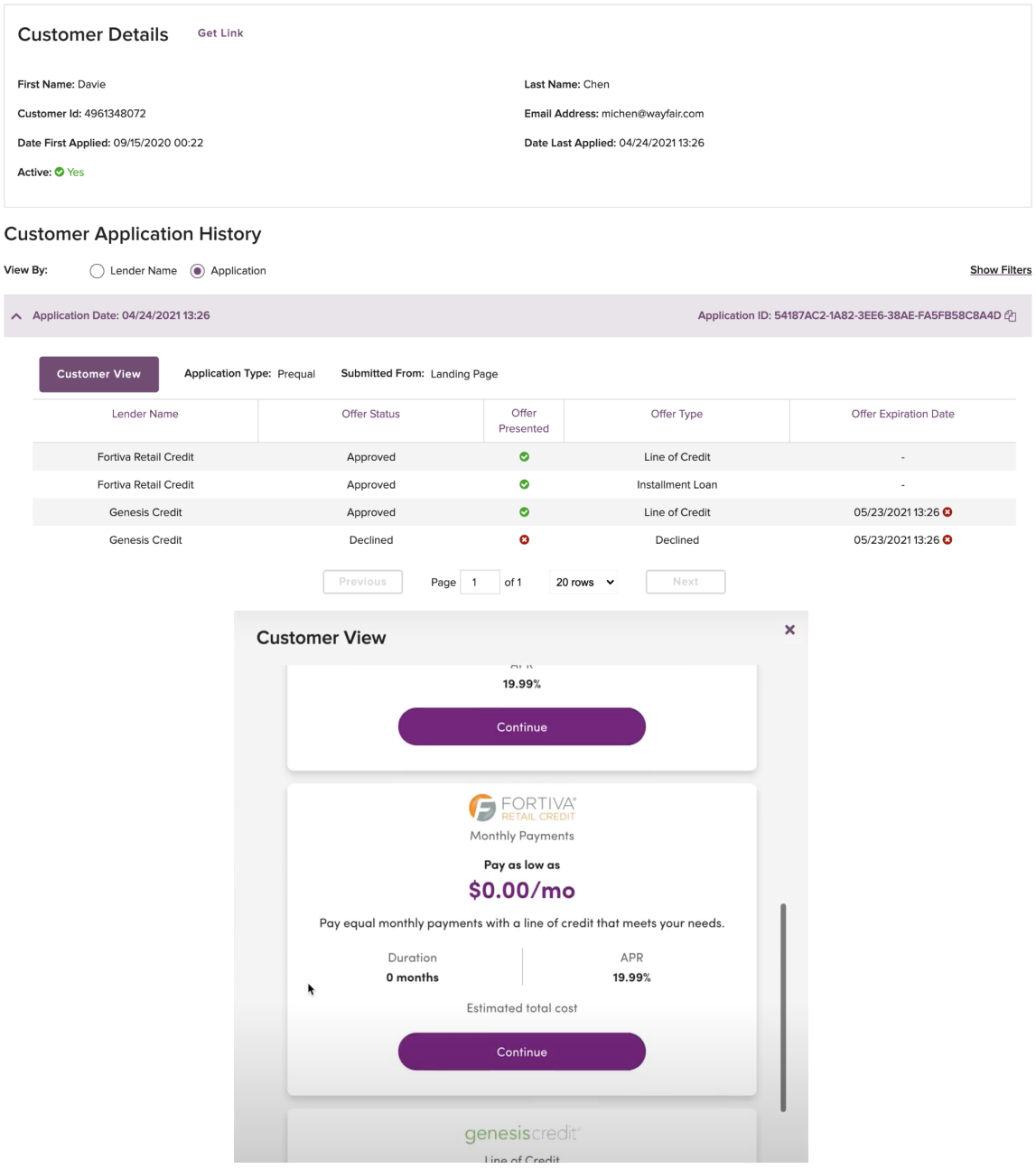

Figure 1: WayFin CST. Images of the Wayfair Financing Customer Service Tool (top) and Customer View panel (bottom). (Houck, 2021).

CUSTOMER EXPERIENCE TECHNOLOGIES AND THE INFLUENCE OF RELEVANT SOCIAL GROUPS

In the past few decades, there has been no shortage of popular media depicting scenarios where extremely advanced artificial intelligence has fully eclipsed the intelligence and capabilities of humans, with movies and shows such as *The Matrix*, *I, Robot* and *Westworld* fueling public discourse on whether humans are in danger of becoming obsolete or subordinate to machines. These works are fictional, but have had tremendous influence on pop culture, technological development, and even public policy, with 2020 presidential candidate Andrew Yang and many other prominent figures proposing a UBI program to counter the loss of jobs to robots, and presidents Obama and Trump establishing various AI initiatives during their respective terms (Chandran, 2018; Harris, 2021). This cultural phenomenon is important, because it illustrates how technologies such as AI and advanced robotics influence public expectations of said technologies, and how these evolving expectations in turn influence the technologies.

In the context of customer service, there are many relevant social groups, such as the customers themselves, engineers, business owners, CX logistics providers, and others, each with varying opinions and expectations towards emergent CX technologies. Complications arise, however, when these opinions and expectations clash with one another. Customers, as one social group, have been repeatedly shown to value personalized communication and empathy, and exhibit higher satisfaction rates when interacting with customer service representatives as opposed to automated systems (Ayyagari & Parahoo, 2018; Bahadur et al., 2019). However, recent market analyses showing the cost-saving capabilities of chatbots and other AI heavily incentivize business owners to implement systems with higher degrees of automation, with one

study by Juniper Research projecting these technologies will save companies billions of dollars on CX by 2022 (2017). When these business owners recognize the strengths and weaknesses of these technologies, and deploy them appropriately, customers with simpler questions are able to get help faster, reducing the strain on the human service agents, but when deployed haphazardly, customers may come away from the interaction feeling confused and unsatisfied (Cardona-Smits & Jacobs). Three potential solutions for addressing inadequate or nonsensical chatbot assistance are shown in Figure 2, which illustrates the various social groups that each proposed solution affects.

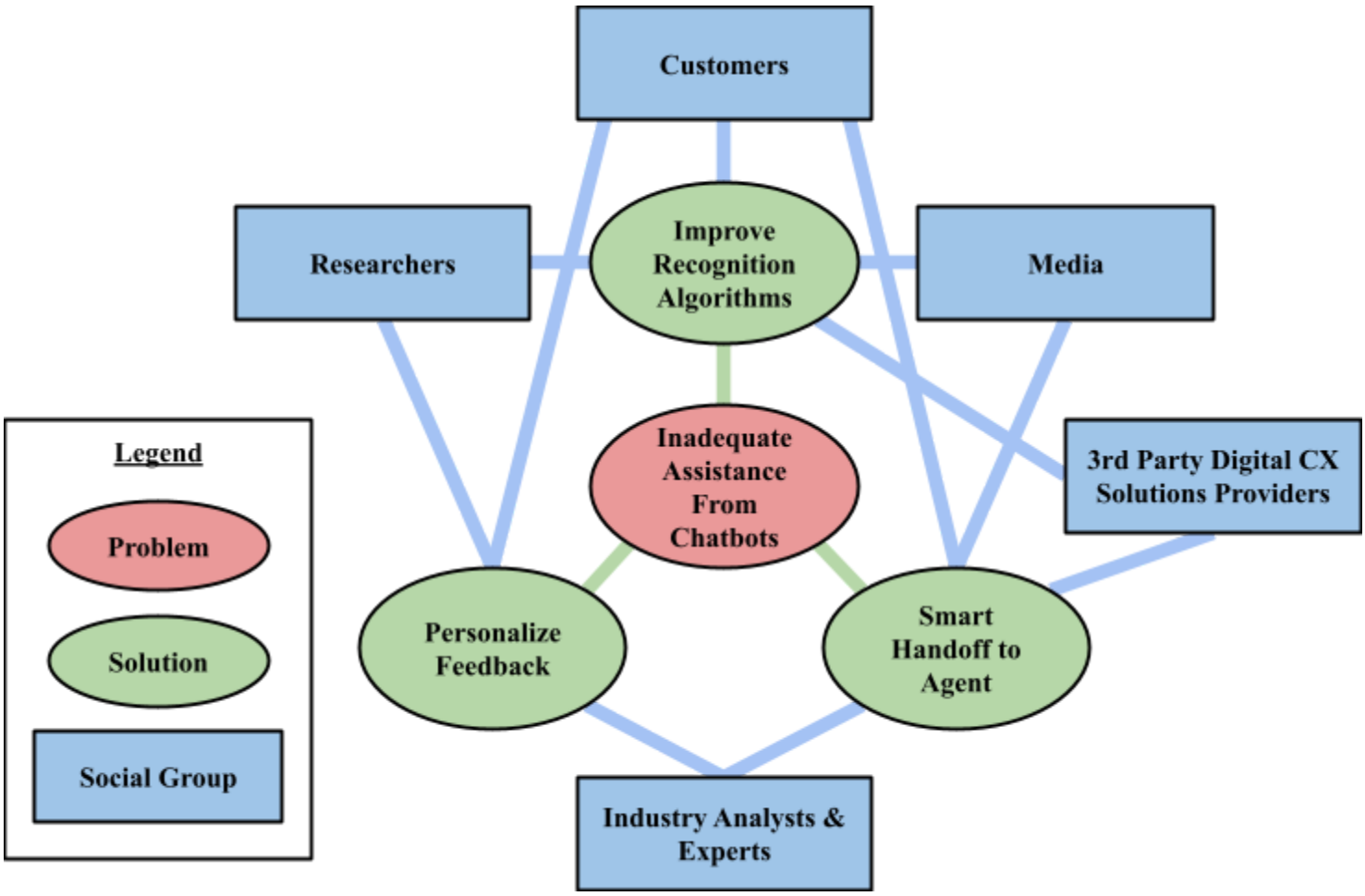

Figure 2: Problem of inadequate chatbot assistance. (Adapted by Houck (2021) from Bijker, Bönig, and Oost, 1984)

Interestingly, while customer service representatives and other practitioners of these technologies are one of the groups most affected by the design choices that go into them, they are also one of the groups with the least amount of influence on said design choices. It is true that, for now, customer service representatives are not at risk of outright losing their jobs to chatbots and other AI software, at least as long as customers continue to value the empathy that human agents can provide. However, of some concern are the ways in which AI is poised to forever alter the job of these agents, and it is unclear whether this is a good or bad thing. On one hand, AI has the potential to free agents from the burden of handling the same repetitive questions over and over, which frees them up to have more meaningful interactions with customers that need more personalized assistance (Birnbaum, 2019). On the other hand, it is concerning that AI is also being used by managers of call centers to more closely and effectively monitor their employees, with programs that notify supervisors when there are mood changes or other conversational patterns during a call that the AI determines is unusual (Deighton, 2021). Customer service representatives that work in departments that implement programs such as these may wonder whether they are actually an improvement at all. Unfortunately, there is very little literature on this topic from the perspective of service agents, so this is a topic that warrants further research.

The technological influence of the varying interests and expectations held by these social groups will be explored using the Social Construction of Technology framework, also known as SCOT (Bijker & Pinch, 1984). The relationships within this network are shown in the SCOT model in Figure 3 on the following page. This STS research project will be written as a scholarly article that will compare the influences of the detailed social groups on the development of CX technologies, and how these technologies in turn alter the expectations and experiences of said groups. It will attempt to demonstrate that technologies that are developed with the goal of

greater agent-technology coordination and increased customer agency will lead to the highest levels of customer satisfaction. This report will be completed under the guidance of Catherine D. Baritaud, a professor in UVA's STS department.

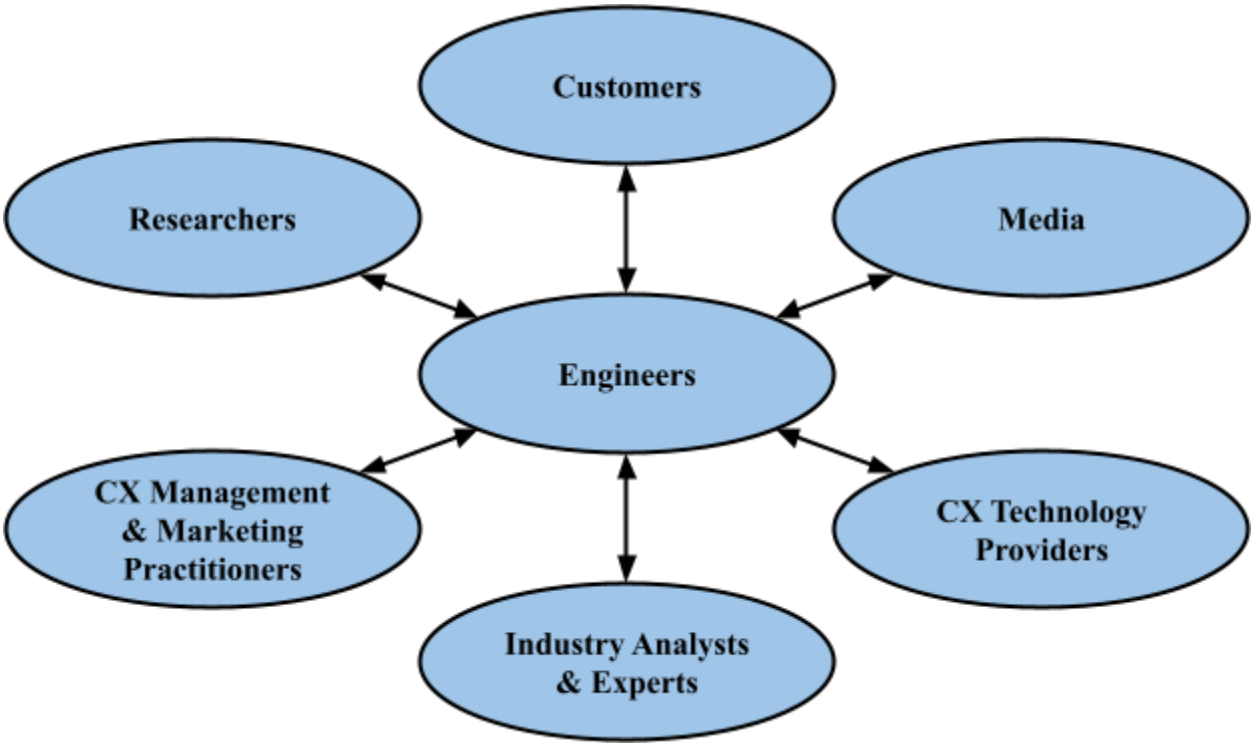

Figure 3: SCOT model of customer experience technologies. (Adapted by Houck (2021) from Carlson, 2009)

THE FUTURE OF SERVICE

Despite frequent rumors that computers are already successfully passing as human beings, most computer scientists agree that our society has not yet progressed technologically to a point where AI, machine learning, and neural networks can fully replace human beings in any practical capacity, let alone in contexts where empathy and personalized service are highly valued (Mosendz, 2014; Johnson, 2021). Still, these technologies have the potential to drastically

alter the landscape of customer experience forever, fueled by expectations of both consumers and business owners, and reinforced by industry influencers who project they will help save billions of dollars for companies that implement them. An ideal approach to integrating these potential solutions into existing CX infrastructures should take all components of a given system into consideration, rather than simply choosing one or two of these technologies and deploying them across the service network.

With this in mind, we can envision many possible solutions to decrease wait times and improve overall customer satisfaction. One such solution could employ a multi-tiered CX architecture, with predictive analytics attempting to detect and prevent problems before they arise, chatbots serving as an entry point into the organization's official service pipeline, which then hand more complex problems off to their human counterparts, who may be equipped with highly usable and efficient agent dashboards. Companies that are able to successfully find a balance between the empathy and intuition of human agents and the efficiency and cost-effectiveness of digital solutions will be well positioned to redefine the field of CX for decades to come. Additionally, the presence of the media, industry analysts, and service representatives within this system brings additional perspectives as to when and how these technologies should be developed and implemented. Ultimately, given how drastically different interactions between companies and their customers are from a century ago, when nearly all business was done in person, it is difficult to envision any potential outcome of these recent technological advancements with complete certainty. It will be fascinating to see whether our society will continue to move in the direction of less personalized customer service, or if the competing viewpoints of the aforementioned social groups will eventually stabilize, with AI and human agents working together to create a better customer experience.

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