Thesis Project Portfolio

Automating Dashboarding Capabilities at Capital One

(Technical Report)

The Future of Marketing: How Artificial Intelligence is Influencing American Consumer Behavior

(STS Research Paper)

An Undergraduate Thesis

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<center>**Sociotechnical Synthesis**</center>

Automation has quickly become a key factor in the business world today. As business becomes more and more competitive, companies are searching for a plethora of different ways to automate tasks in order to avoid redundancy and efficiently use resources to upscale production. This portfolio follows two independent projects that seek to highlight and demonstrate the effects but also the importance of automation in the business world. The technical research topic explores internal tool automation techniques and the STS research topic addresses the implications of the role of artificial intelligence in the automation of marketing strategies and its effects on American consumer behavior. For the technical research topic, a dashboard automation tool was created to automate the process of creating internal dashboard tools used at Capital One. It was designed and created in an effort to reduce redundant code, since most teams would design dashboards that served a similar purpose. For the STS research topic, the question: "How has the age of artificial intelligence affected modern American consumer behavior?" is explored through the examination of several case studies of how American consumer behavior has changed in the past.

Redundant code is a large issue throughout any collaborative coding effort. There are a large number of ways to approach many situations and significant time is often spent towards accomplishing something that someone else has already done before. The team was tasked with leveraging different languages and frameworks as well as company technologies to automate the creation of dashboards. The primary work was creating template files and a command line interface that would populate the template files. The command line interface would allow users to input basic information about their dashboard and the application would populate these template files and create the necessary code to create not only a working dashboard, but also generate the resources necessary to have it running on the cloud. A web wizard was also created

in order to integrate the command line interface with a web application that serves the same purpose, but is more accessible for users more unfamiliar with using command line interfaces. Doing so not only substantially reduced the effort needed to stand up a dashboard, but also kick-started the potential beginnings of a "marketplace" with the purpose of reducing redundancy throughout the company.

As the world continues to embrace consumerism, marketers are seeking to understand how to leverage consumer behavior in order to stay at the forefront of their industries. However, this field has gone through drastic changes throughout the years through the course of defining events such as the rise of the digital revolution as well as the COVID-19 pandemic. Each of these events have significantly altered the way that consumers approach purchasing decisions. More recently, however, we are seeing the brink of a revolution on a whole other scale with the rise of artificial intelligence. With its autonomous nature, artificial intelligence opens up numerous opportunities for marketers with its ability to process copious amounts of personal information available on the world today. The STS section seeks to determine how technological and societal implications of artificial intelligence will impact modern American consumer behavior, and how that information can be used to understand future shifts. Research papers, articles, studies, and journals will all be used to gain an understanding of how American consumer behavior has responded to external forces in the past and how a new technology like artificial intelligence will shape it. The research will be analyzed using technological determinism to better understand the impacts of the autonomous driving nature of artificial intelligence in modern marketing strategies. The results of this research alongside understanding of previous shifts in marketing and American consumer behavior will lay the groundwork for a future understanding of how the

average American consumer will respond to future technological advances and better understand both their own purchasing habits and how those can be leveraged against them.

Overall, this portfolio highlights both technical as well as the social and more theoretical effects of automation in the work place. The technical portion of this portfolio explores a more concrete business application of modern automation techniques whereas the STS section takes a more theoretical and seeks to make a prediction rather than an observation. Throughout both sections however, the implications are clear: the future will be automated. Even though rudimentary automation systems are in place such as the dashboard automator that was specified in the technical portion, artificial intelligence brings automation to another level. Conducting both projects in tandem not only bridges this gap between tangible, technical topics with theoretical and social topics, but also provides insight on the differences and similarities between the two. With the usefulness of current automation tools and a bright future ahead through the use of artificial intelligence, this portfolio reinforces the importance of modern automation efforts as well as explores the social implications as well.