

Safe and Sustainable Fleet Management with Data Analytics and Training
(Technical Paper)

Social Media: A Dangerous Marketing Platform from a Consumers' Perspective
(STS Paper)

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Introduction

In 2018, the transportation sector of the United States (US) accounted for 28% of total greenhouse gas emissions with 82% of emissions being sources from light-duty vehicles and medium to heavy-duty trucks (US EPA, 2020). In 2017, 47% of drivers in motor vehicle crashes were not wearing a seatbelt and buckling up can reduce the risk of fatal injury by 45% (NHTSA, 2020). Accidents with disabling injuries have an average cost of \$78,900, accidents with non-disabling injuries \$8,900, and a minor car crash averages \$10,000 for an uninsured driver (What Is the Average Cost of a Car Accident?, 2020). The University of Virginia Facilities Management Fleet Team (FMFT) has recently been classified as a “Sustainable Fleet” by the National Association of Fleet Administrators (NAFA) and continues to look for ways to decrease fleet emissions in parallel and increase driver safety and compliance utilizing in-vehicle monitoring sensors to log vehicle status throughout each trip. The final deliverable for this technical project will be a personalized driving program that identifies areas of improvement for both sustainable driving behaviors and safety compliance regarding each vehicle within the UVA Fleet.

The rise of ecommerce has impacted global emissions, and social media has subtly transformed from a place for users to connect with people to a place for their wallets to connect with businesses. The internet is becoming a platform of wet cement, logging every detail of every interaction you have with a business from items viewed, to time spent browsing, to types of items purchased (“Your Data Is Shared and Sold...What’s Being Done About It?”, 2019). In order to keep users engaged with the business for as long as possible, these businesses look to show up where they engage themselves the most – on Social Media. Although this form of commerce is favorable towards businesses, targeted advertisements raises concerns for

consumers as platforms such as Instagram can reach 900 million users and Facebook can reach 2 billion monthly users with advertisements (Cooper, 2020). Understanding how social media has transformed marketing approaches allows consumers to better understand how social media is leading them to spend more money than ever before. The final deliverable for this second project will dive into the dangers of social media from a consumers' point of view.

Technical

In 2018, the transportation sector accounted for 28.2% of greenhouse gas emissions that primarily includes “burning fossil fuels for cars, trucks, ships, trains, and planes” which accounts for the greatest proportion of emissions in the United States (US EPA, 2018). To lower these emissions, eco-driving programs have emerged to influence changes in driving behavior around topics such as braking, driving speed, and the impacts of idling on overall fuel consumption (Huang et al., 2018). Such changes in behavior can lead to a decrease between 5-20% in overall fuel consumption which helps drivers both save money and lower their carbon footprint (Rakotonirainy et al., 2011). The University of Virginia's Facilities Management department is one organization that has started using in-vehicle monitors as a way to track the performance of their vehicle fleet. Currently, UVA Facilities Management does not have a suitable method for using driver performance data to improve fleet safety and sustainability by altering driver behavior. A leading cause of Facilities Management's complacency is their lack of a comprehensive driver training program.

Within the past 5 years UVA Facilities Management has installed Geotab telematic tracking sensors on every vehicle in their fleet. These in-vehicle sensors constantly collect and compile a broad range of driver performance metrics such as harsh acceleration, hard braking, hard cornering, speeding, fuel consumption and seat belt usage. This data is then stored on a

server and management can pull all of the raw data directly, or choose to produce scorecards which highlight the number of incidents that occurred based on specified criteria and thresholds. These incident counts are then normalized based on distance driven and standardized to be between zero and one hundred (Geotab, 2018). Finally, a weighting system is applied to these metric scores to obtain a single vehicle score that can be used to classify and compare the performance of different vehicles.

The development of a comprehensive driver education program must be supported by relevant prior research, as well as an extensive analysis of UVA-specific driver performance data. “Performance” in this context can be understood as the extent to which a driver complies with safety laws and engages in sustainable driving behavior. Facilities Management has specified that vehicle drivers must comply with seatbelt laws and speed limits at all times. As such, driver compliance will be measured by the frequency of speeding and seatbelt misuse incidents. As a result, driver safety will be measured by both the degree of driver compliance along with the frequency of harsh acceleration, hard braking and cornering incidents. In terms of measuring sustainability, or “eco-driving,” driving speed and idling have been shown to be among the most crucial metrics to consider in regard to fuel consumption (Huang et al., 2018). In the context of this technical project, vehicle speed and idle fuel consumption will be used to classify driver behavior in terms of their contribution to the sustainability of the overall fleet.

Using these various methods of classifying driver behavior, the developed personalized training program will be curated to identify opportunities for improvement for individual drivers. In order to evaluate the efficacy of a personalized training program, a multi-week pilot test will be conducted with a selection of UVA drivers and vehicles. Driver performance will be measured before and after the implementation of the training program with the pilot program

consisting of a general program with both safety and eco-driving components. A pre-pilot program will be used before the end of the Fall Semester to help design the final pilot program that is expected to start at the beginning of the Spring Semester. Results of the pilot test will be compiled and analyzed with the intention of improving the training program through further iterations. This project's final deliverable will be a fully developed training program that could be implemented across UVA Facilities Management's entire vehicle fleet to improve the fleet's safety compliance and eco-driving behavior.

STS Topic

Within the past 10 years, social media has quickly integrated itself into peoples' daily lives and as a result, has become a platform that most of the population engages with regularly. One of the main aspects of social media involves a form a dopamine hit which is achieved whenever another person likes or comments on a users' post (Hayes, 2018). This hit then convinces the body to engage in similar activities and since the effort to achieve such a hit is relatively low, a user is incentivized to stay engaged on the platform. A study by Columbia Business School in 2013 suggested that participants who engaged in social media had lower credit scores and higher credit card debt which result from a lower discipline of self-control (Columbia Business School, 2013). As a result, businesses are capitalizing on this new addiction and lack of self-control by enticing consumers with advertisements seamlessly within each of these platforms.

The first part of the issue is not in the advertisements themselves, but rather with the fact that these advertisements are targeted based on criteria specified by the business with more specific demographics requiring a smaller budget than a broader demographic requires (Barnhart, 2020). Historically, marketing consisted of reaching the largest number of customers possible,

starting with magazines in 1730s, radios in the 1920s, televisions in the late 1900s, to the internet in the early 2000s (Wainwright, n.d.). The transition to social media advertising plays heavily in the favor of business as they are able to engage directly with their customers through two-way communication to promote greater traffic and personal connections between both parties. Data collection through social media also allows businesses to engage in practices, such as geotargeting to target audiences within a specific location, and retargeting which target customers who have interacted with specific brands before (Albright, 2018).

Only when businesses capture a customer's attention is when the second part of the issues emerges. Alongside social media, ecommerce has steadily been on the rise, with online sales increasing by 14.9% in 2019 (Young, 2020). One of the key differences between ecommerce and brick-and-mortar stores is not necessarily the ease of purchase, but rather the impact purchasing has on the brain. When purchasing an item in-store, a user has the option to pay with cash or card compared to only card when paying online. This discrepancy is important because paying in cash activates the pain receptors within the brain are compared to paying with card which has little to no brain activity in the same region (Ceravolo et al., 2019).

Although the dot-com spurred some interest into the potential of the internet, the development of social related sites did not establish itself until the development of MySpace as a leader in 2004 (Ortiz-Ospina, 2019). Still, around that time, social media growth was stagnant until the introduction of the iPhone in 2007. The introduction of a smartphone lead to the increased capabilities of a smartphone through innovation which has more than doubled smartphone ownership from 35% in 2011 to 81% in 2019 within the United States (Pew Research Center, 2019). Understanding the development of smartphones and mobile media can help view the necessity of social media through the interpretation of technological momentum.

Critics argue that technological momentum is “essentially deterministic because it places technology at the center of the historical process and links everything else to it,” however, Hughes highlights the importance of time-dependence by noting that society has influence over younger systems while more established systems have a greater influence on society (Hughes, 1994). Analyzing Hughes’ approach to the development of social media can help consumers understand the tactics employed by business which can drive both consumer awareness and spending discipline along with supporting Acts of legislation to keep businesses from exploiting every possible dollar from a consumer’s bank account.

Methodologies

Research Question: How does Social Media serve as a dangerous platform to encourage customers to purchase more than they otherwise would?

To answer this question, this paper will be built upon wicked problem framing and documentary research methods. At the beginning of the paper, I will give a brief background of the rise of social media as well as the adapting marketing strategies that have developed with new technological capabilities. Wicked problem framing will be used to describe the connections between ecommerce, social media, and marketing to highlight how businesses thrive off of customer spending, while mentioning the balance that needs to exist between healthy spending and saving. With the addictive nature of social media, users scroll through advertised content which then draw them into direct transactions with the business hosting the advertisement (Haynes, 2018). The framework will help understand the nature between marketing and online engagement to show that consumerism, although good for the economy, may come to an end if businesses become overzealous.

Documentary research methods will primarily be used for studies to highlight the impact non-cash related transactions have on a consumer's willingness to engage with a product (Prelac & Simester, 2001). The studies will also include the relationship between the psychological effects social media has on a user which affects their tendency to purchase. Some of the research will involve pulling recent statistics on user engagement with social media platform and the success rates of advertisements and their customer conversion rates (Cooper, 2020).

Conclusion

This proposal covers the research and training of driver habits within UVA's Fleet Team along with the impact of social media on the spending habits of teenagers today. The team will gather data related to driving habits within each of UVA's Fleet vehicles to produce a driver training program to increase compliance and encourage sustainable driving behaviors. We expect to see UVA's fuel efficiency to increase along with an increase in compliance across the whole fleet. These results will not only increase UVA's Fleet Team's reputation but also lead to safe, sustainable, cost-effective driving that benefits both drivers and the environment.

This proposal also covers the impact social media platforms have on connecting businesses with prospective customers. With the recent rise and popularity of smartphones, more and more users are becoming involved with one form of social media, increasing the ability for businesses to advertise to their desired demographic. This research will help consumers of both social media and products to understand how businesses are encouraging users to spend more money than they otherwise would which impacts debt accumulation the ability to plan for future endeavors.

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