Sociotechnical Synthesis

Technological optimization is crucial to increase efficiency, adaptability, and overall performance. Whether it be existing algorithms or innovating new technologies for specific use cases, optimization is a necessary step in the development lifecycle. In the case of database querying, fast and accurate execution is crucial for applications to engage with users. This concept is examined in the technical paper through Entity Framework(EF) queries and performance enhancement strategies. In contrast, the STS paper looks at technological innovation for in-car technologies and how they are geared towards reducing distractions while driving. The overall STS research focuses on how masculine norms encourage men to use in-car technology, which creates an environment prone to distracted driving. While these projects both explore technological optimization in some form, they differ in their consideration of technology and the role it plays in our lives making them unrelated.

If a query takes too long to manipulate or retrieve data it can delay the users using the application, which can cause a loss of interest. Slow tasks also use a lot of the computer's energy and resources, which can stop other tasks from happening smoothly. The technical problem for this project explored various optimization techniques on data searches, specifically focusing on improving the use of computational resources for business standards. The queries utilized in this study are related to data handling for CoStar Group and had certain timeout restrictions to ensure efficient usability for their software products. The solutions attempted for this problem included breaking down complicated queries into simpler ones that can run faster. We measured performance using tools provided by the coding environment that helped determine the time taken to run a query and how much memory it used. This analysis method enabled us to find the optimal strategy for both runtime and memory consumption. Through this process we found that certain strategies could be universally applied to all queries, not just the ones we focused on, to lower memory consumption and save business resources.

The STS research studies how masculine norms are depicted to men, causing them to embody them and apply their learned behavior to driving. I focused on examining how these norms can cause men to participate in distracted driving using in-car technology, as it is one of the leading causes of death for young men in the United States. As new in-car technologies are being developed to reduce distractions, it is necessary to identify how their designs impede distractions, and how they can be used by drivers to create new distractions. I argue that masculine norms teach young men to overestimate their true capabilities in order to appear more masculine, causing them to engage in risky behavior while driving. This behavior extends to the use of technology which splits a driver’s attention from using the technology and driving their car. I analyzed various research studies by behavioral psychologists and mainstream media productions to determine how masculinity is presented and internalized by men, as well as its effect on driving behavior. I determined that masculine norms are taught to young men through the validation of certain behavior, and especially noted that risky behavior was consistently thought to be more masculine and rewarded for young men through social acceptance.

The STS topic was limited as I generalized my findings to all men. Future works should look at identifying if cultural traits affect men’s perception of risk vs reward. Additionally, I was unable to look at the innovation of in-car technology from the beginning. A continuation of this work should investigate the nature of how in-car technology is designed to be compatible with all users and if they can be made to eliminate distractions rather than reduce them. The technical topic was able to consider large datasets and many optimization strategies with a deterministic

solution to implement. However, there were more nuanced edge cases that could not be solved. Future works on EF queries should look at implementing a solution that addresses edge cases to ensure data searches are efficient. The current implementation does not allow all relevant data points to be returned imposing limitations on the data returned.

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