Thesis Project Portfolio

Service Operation Management: Internal Web Application and API for Service Development and Production Support

(Technical Report)

How Engagement and Attention Engineering in Facebook and Instagram has Contributed to Social Media Addiction Among Users in Generation Z

(STS Research Paper)

An Undergraduate Thesis

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

Introduction

My undergraduate thesis portfolio includes both a technical report and STS research paper. I wrote my technical report on an internship project from the summer of 2022, where I built a service development and production support API and web application. My motivations for writing about this project were that it demonstrates the development process and priorities of modern technology departments, and was the most formative engineering experience I had during my time at UVA. My STS research paper was written on how attention and engagement engineering in Meta's social networking platforms has contributed to addiction among Generation Z, and was motivated by the increase in social media usage during the COVID-19 pandemic and the fact that I have a personal connection to the topic as a member of Gen Z. While the two papers are not connected in subject matter, they both draw attention to the way that the software architecture of modern companies is structured. The technical project is an example of one of these smaller systems that fit into a company's suite of internal services, while the massive platforms that are the subject of the research are composed of a variety of these smaller services containing different functionalities.

Technical Report

My technical report details a finance-area product team at a used car retailer and financer based out of Richmond, Virginia that decided to improve access and usability for various elusive, confusing, and time-consuming functionalities for service development and production support. The system falls under the category of information technology service management, which has become increasingly important to companies for increasing the efficiency of software development teams. As an intern, I achieved this using a custom API and web application that

combined functionalities into a centralized suite of tools. The project, titled Service Operation Management (SOM), was built first as an ASP.NET API and later integrated with a web application. Using React and an internal design library, my mentor and I developed a user interface so these tools could be readily available for software developers in the finance area. The functionality of the tools in the SOM comes from both custom company systems and Microsoft Azure, and it has increased the agility and efficiency of the team that developed it. Plans include adding more tools, building out the administration system for customization purposes, as well as rolling the system out to other teams in the company.

STS Research Paper

In the STS research paper I examined the addictive effects of Meta's Facebook and Instagram platforms on members of Generation Z as a result of engagement and attention engineering practices, and investigated how society might remedy the negative social impacts it has had to protect future generations. Sources included research from academic databases, articles from reputable news outlets, proposed legislation, and books written by experts in the psychology or technology industries. This case study analysis covers the engineering tactics used by Meta and the relationship that they have with social media addiction in young users. Beyond that, I studied how the business models encourage Meta's practices and how the engineering and widespread adoption of the platforms, for both personal and business uses, have formed a positive feedback loop that has caused the addiction problem to proliferate. This subject was analyzed through the lens of Actor Network Theory, where many relevant human and non-human actors were considered in addition to the ways in which the technology and end users interact with each other. I concluded by informing the reader about the failures of our legislative system, ideas for future work in the area, and recommending some paths forward to a solution.

Concluding Reflection

In producing these documents, I gained an immense amount of experience and skill in writing, research, and communication of technical subject matter. In producing these papers simultaneously, I was able to observe the differences in process and structure of papers that serve entirely different, yet both exist in the realm of engineering and computer science. Through writing the technical report, I improved my ability to communicate complex technical concepts to a non-technical audience. This is a valuable skill that I will leverage throughout my professional life, as I will often need to define requirements or discuss system plans with clients or management. As for the STS research paper, I will forever view technologies that I observe, use, or create with a new found understanding of their intricate construction and vast societal implications. Producing these two papers simultaneously has demonstrated the breadth of the purpose and format of engineering and technological knowledge production and communication, growing my competence and confidence as a young engineer just entering the industry.