iOS Development: Creating A Command Line Tool to Auto-Generate Boilerplate Code

The Effect of TikTok Usage on Feelings of Loneliness in American Users

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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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Introduction

The use of technologies is continuing to make up a larger portion of people's daily lives as more and more families are gaining access to services like the internet (Konca, 2022). One such innovation is the mobile phone, which has become so commonplace that as of 2018, approximately 65% of consumers worldwide own a mobile phone, with the percentages being as high as 95% and 84% in the United States and Europe respectively (Grewal et al., 2018). Consequently, the ownership of a mobile phone presents many alternatives to in-person interactions through online services offered by applications. One of the most popular online activities offered by smart phones is the usage of social media, which was used by 4.26 billion people worldwide in 2021 (Dixon, 2022). Known by many in the social media space are the renowned corporations Facebook and Instagram. But with the implementation of new functionalities, another platform called TikTok has quickly risen to popularity, retaining over one billion monthly active users across 150 countries as of October 2022 (Doyle, 2022). The social media application takes a different approach than its competition by providing videos in a shorter form, originally allowing videos up to just 60 seconds to be posted for people's enjoyment (Midson-Short, 2022). Additionally, users can find a new video to watch by simply swiping up on their phone. This concept of accessible, easy to digest content has allowed TikTok to flourish where users are not only coming back for entertainment, but also other needs such as daily news.

With TikTok having become a part of billions of lives, it has joined the ranks of the most influential platforms, and thus, it should be scrutinized as such. For instance, a documentary called *The Social Dilemma* was produced to research Facebook and found evidence to suggest that the app negatively affects users' mental health (2017). However, as Masciantonio et al. found, just because one platform has been suggested to affect its users one way, does not mean

such a conclusion can be extrapolated to all social media sites (2021). Therefore, because TikTok is so new and unique, it is crucial for further empirical research to be done on the application individually for any potentially harmful effects (Montag, 2021). This is especially true considering its largely younger user base, which Doyle found ~60% of them to be between the ages of 10-29 years old (2022).

Furthermore, with the recent COVID-19 pandemic having occurred, people were forced to quarantine themselves, making them unable to see family, friends, or anyone else. A study by Winerman revealed that this period of self-containment caused a small, but still significant spike of 5% in the prevalence of loneliness of people across four different continents (2022). Thus, with social media having been used as a way to stay connected with loved ones, and TikTok having grown rapidly around the time of the pandemic and beyond, I believe it is important to research the question: how has the recent growth of TikTok affected feelings of loneliness in its users?

Technical Topic

For my Capstone project, I write about the project I completed during my summer internship working with Capital One Financial Corporation, an American bank holding company. For my technical project, I worked with an iOS platform development team to create a command line tool that generated boilerplate code for the API request file of a given plugin. In other words, I developed a shortcut for developers of the company's iOS application to use to generate a basic template for code that is consistently used. To do so, I learned to use Apple's integrated development environment Xcode and programming language Swift, the version

control software GitHub, and code generation framework SwiftGen. Additionally, I studied the iOS environment, worked through an agile process, and constantly communicated with my team to ensure the success of the project.

The reason for this technical assignment is that Capital One wanted to increase production of its iOS feature developers by replacing its inefficient, manual process of writing repetitive code for plugin request files with a tool that automatically generated such code. With over 5.6 million reviews on the Apple app store, Capital One Mobile is widely used by the company's 44 million users. In order to continue its 4.9-star rating (out of 5), iOS developers must continue to update the app, ensuring its features are up-to-date with modern software tools and always functioning properly. However, apart from making more hires for software developer positions, there is no simple way for Capital One to further increase its speed of production. This applies to the corporation's iOS application, where feature developers work to create new features as well as improve pre-existing ones offered by Capital One Mobile.

For any of these features to appear on a user's screen, an API request must be made to obtain the necessary designs and functionalities from Capital One's API. Therefore, code must be written for an API request for every single plugin created. Additionally, the general code structure for each API request is very similar, so the work to be done by feature developers tended to be repetitive. Furthermore, developers would place the API request files in different locations within their plugins, making things more difficult to locate when looking at another's code. By making a tool that created starter code for the API request files, the relative location of such files could be standardized and feature developers would be able to save time that can be put towards implementing new functionalities.

As a result of the internship, I helped to develop a minimum viable product that speeds up the request file creation process by roughly 85%. There are plans to further improve upon the base product, to allow more unique plugins to utilize the command line tool, as well as expand a similar concept for Android development.

Similar to TikTok from my research question for my STS project, my technical work was designed to replace human actors with a technological alternative. For instance, in the case of TikTok, it can be viewed as a replacement for real, in-person relationships, as can be said for the purpose of all other social media platforms. Comparably, the command line tool developed by me and my team was made to replace the work of the very same feature developers that utilize it.

STS Topic

The creation of TikTok offers users a platform to create and share creative, short videos, allowing people to express themselves and build a connection with a community of alike interests. Through the use of its unique algorithm, TikTok is able to offer everyone an experience catered to them (Arslan, 2022). However, as Winner (1980) claims, there are politics involved with all technologies, and TikTok is no exception. Before online services like TikTok came to be, people would interact face-to-face, allowing for more engaging conversations and the fostering of stronger relationships (Plumridge, 2020). Not to directly say that online interactions offered by TikTok is bad, but increased usage of such an application does take time away from in-person opportunities, especially when users are getting on the app every day according to a study by Kovács et al. (2022). Furthermore, Latikka et al. (2022) discovered that if a user were to already perceive themselves as being lonely, then participation in online platforms could enhance

such a feeling and even lead to more negative mental issues down the road. Therefore, I hope my STS research addresses the idea of replacing a human interaction with a nonhuman alternative as in the framework of Actor-Network Theory, which is the scope I will use to analyze TikTok in my research's context (Latour, 1992).

Latour (1992) describes Actor-Network Theory to be a concept where both humans and nonhumans are considered equally when looking at the associations that contribute to a technological system. This way, not only are TikTok users considered as an actor, but TikTok itself is also examined as an actor. Additionally, there's also the human actors that TikTok users may interact less with due to being replaced by TikTok. Latour (1992) calls this concept delegation, where a typically less skilled human actor is superseded with an upgraded nonhuman actor. In this case, people like friends and family are replaced with TikTok, where scrolling through the app is chosen over interacting with loved ones. Delegation can be further broken down into multiple dimensions of prescription, subscription/de-inscription, and pre-inscription. (Latour, 1992). Through these dimensions, I hope to learn from the many associations that come with the use of TikTok.

Research Question and Methods

To reiterate, I want to look into how using TikTok affects one's well-being and more specifically their perception of themselves as lonely. And with studies like that by Tang et al. (2021) suggesting that too much time on TikTok can lead to very negative emotions that consequently have users ignoring their pre-existing, real-life relationships, the need to investigate my research question grows more imperative. Not to mention in a 2022 study, there were found

to be positive correlations between time spent on TikTok and feelings of loneliness (Dong). It is important to note, however, that Dong's research also discovered that the impact TikTok has on someone depends on the user's motivations behind its use. For instance, a positive correlation was found between TikTok usage and life satisfaction when the user opened the app with intentions of relationship maintenance, wanting to support those a part of pre-existing relationships on the platform (Dong, 2022). Still, most of people's motivations behind using TikTok are suggested to be for gratification of entertainment or possibly expanding one's social circle from the perspective of content viewers and creators respectively, as determined in a study by Bossen and Kottasz (2020). With everything that's been said, I want to point out that many of the aforementioned claims are from international studies because many of the current existing studies on TikTok usage and its effects on users' mental health are done in countries like China as opposed to a place like the United States. Hence, the current challenge I face with my research is a lack of variety in study samples, making it difficult to make any concrete conclusions for everyone. Thus, I hope to promote the idea that further research is still necessary on TikTok, especially on western nations of various populations and demographics so that we may determine something meaningful.

In order to eventually answer my research question, I will conduct a literature review by synthesizing preexisting research findings on the effects of TikTok usage to determine what is known, what lessons can be learned, and what needs to be analyzed further in the future (Snyder, 2019). I will look into studies from all different areas in the world within the past three to four years because there is a very limited number of studies that have been done since TikTok's creation in 2017, so at this point any study is helpful to build a baseline (Shutsko, 2020). Apart from inspecting effects of TikTok on users' mental health, I will examine research on feelings of

loneliness over the past few years to see if there has simply been a rise in such emotions, especially considering the recent quarantining done by many during COVID-19. Finally, I would also like to investigate other related technologies and their impact on users, like the big-name social media platforms of Instagram and YouTube that share similar aspects and features of TikTok.

Conclusion

By the end of the literature review, I anticipate to have developed a consolidated foundation of knowledge on the current findings of TikTok and the effects of its usage. This way, a baseline of what we know on the new social media platform can be built and used for future research. On the STS side of things, the hope is to draw a connection between the aspects of Latour's Actor-Network Theory like inspection and prescription with the features of TikTok to develop an understanding of how the app is used as an alternative to face-to-face interaction and why that is (1992). As a result of these findings, the end goal is to then inform those who can regulate or make recommendations on the usage of the app, such as a parent or mental health professional, if studies suggest TikTok to be harmful. I also hope to educate future developers on the social ramifications of TikTok, so that similar applications that are built later on can focus more on positive features while neutralizing the negatives.

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