Toward Broader Knowledge of the Dangers of Facebook: An Analysis of User Awareness and Behaviors

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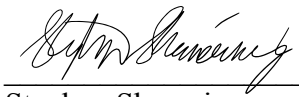
On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Signature  Date 5/5/2021
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Abstract

The social media platform Facebook has been shown to have widespread negative effects on individuals and society as a whole. Movements to boycott and reform the platform have begun, but little is understood about users' awareness and perceptions of the platform in order to guide further conversation about reform. This work finds that Facebook continues to grow in size and influence because users lack awareness of Facebook's inner workings and impacts, and many continue to use it, albeit with reluctance.

Developed by STS scholars Callon, Latour, and Law, actor-network theory is a method for interpreting sociotechnical systems through the changing relationships between the actors that compose them. It is used in conjunction with literature review to analyze the public perception and awareness of the platform. Past work concerning individuals' motivations for using or quitting the platform, users' knowledge of its algorithms and impacts, and movements to leave the platform is analyzed. Results indicate that most users do not understand the News Feed and other algorithms; many users are not aware of the role of the platform in exacerbating polarization and misinformation; and many users continue to use the platform reluctantly for want of a better alternative.

Toward Broader Knowledge of the Dangers of Facebook: An Analysis of User Awareness and Behaviors

Is Facebook implicated in the Rohingya genocide? From 2012 to 2017, the Muslim Rohingya minority group in Myanmar were victims of murder, rape, and violence that forced over 700,000 of them to flee the country (Mozur, 2018). These events were part of a scheme by military officials in Myanmar using disinformation to incite ethnic cleansing, and they carried it out on Facebook (Mozur, 2018). While this tragedy involved deliberate abuse of the power of the Facebook platform, there are other widespread problems that arise naturally out of the platform's business model and inner workings (O'Neil, 2016; Orlowski, 2020; Sunstein, 2017; Vaidhyanathan, 2018). In addition to these societal impacts, individual users are affected by the consequences of Facebook's practices with regards to data, including the compromising of privacy through scandals like Cambridge Analytica as well as behavioral manipulation through Facebook features and social experiments (Bond et al., 2012; Orlowski, 2020).

Solving the problems associated with Facebook is important because not only do they have widespread negative consequences, but they also impede progress on more pressing existential problems like climate change and human rights (Mozur, 2018; Orlowski, 2020). Given the current state of the platform, mitigating these problems requires a movement of boycott and reform, and achieving this requires users to be aware of Facebook's practices and their impacts. To understand the current situation, this research analyzes the public awareness of Facebook with respect to these issues. Actor-Network Theory is used to frame this analysis to clarify the actors involved and the relationships between them. Literature review is conducted to interpret past work around the usage and perception of Facebook to historically contextualize changes to the user base and the technology itself. Since its founding in 2004, Facebook has

transformed from a college students-only social network into one of the most valuable companies in the world, with a dominant share of the digital advertising market and almost 3 billion users worldwide. This work finds that despite its harms, Facebook continues to grow in power and influence because of widespread lack of awareness of its inner workings and wide-reaching impacts and reluctant usage by the public in opposition to the common good.

The Facebook problem

Facebook is the world's largest social network with almost 3 billion monthly active users (Statista, 2021). The company also owns several of the other largest social networking platforms and services, including Instagram, WhatsApp, and Messenger. A market capitalization of almost $750 billion places Facebook in the top ten largest corporations in the world by value, all while providing free services to its users. Through these services, Facebook has many positive effects. For users, Facebook offers instant connection to acquaintances, friends, and family all over the world. It provides ways to meet new people through shared interests or experiences or to reconnect with old friends or colleagues. For some niche groups or small geographical communities, Facebook can be the best—if not only—way for members to communicate and share resources quickly. It is a key tool for many American adults to stay informed about current events (Shearer & Mitchell, 2021). Facebook's instant messaging (through the Messenger service) helps people not only with general socialization but also with communication in emergencies, including natural disasters and mass shootings. The algorithmic personalization of content enables rapid dissemination of content related to social movements, such as digital evidence of injustice, logistical communication between activists, and informational content for the masses. In fact, Facebook, Twitter, and other platforms are largely responsible for the

origination and growth of the Black Lives Matter movement (Britannica, n.d.). For businesses, Facebook is a valuable marketing tool, allowing them to reach billions of people with specifically targeted advertising, aimed at groups of users as small as 10 in size (Vaidhyanathan, 2018). These advertising offerings make up nearly all of Facebook's business and are the key to its rapid growth and financial success.

Underpinning the targeted advertising model and the entire Facebook business is a system described by one scholar as "surveillance capitalism" (Zuboff, 2019). In this system, online platforms extract behavioral data from users through any means possible and model that data to generate predictions of user behavior that are sold to advertisers. Because better predictions attract higher demand and more money, profit-motivated corporations are incentivized to create the most accurate models of human behavior possible by collecting more data. Data collection occurs primarily through free services provided to users, and companies go to great lengths to expand the offering of these services, such as by developing or acquiring new products (like Facebook's acquisitions of Instagram and WhatsApp, or Google's acquisitions of YouTube and FitBit) (Zuboff, 2019).

Companies also take steps to enhance the data mining powers of their platform by introducing new features and algorithms. In particular, Facebook is known for features like the Like button and the News Feed. A 2020 documentary on social media and its dangers provides firsthand accounts from the development of these features. In the film, *The Social Dilemma*, early engineers and executives at Facebook describe the main motivation for developing these features: increasing user engagement and data collection (Orlowski, 2020). The like button provides a more interactive experience for users than simply reading or commenting; at the same time, every click of it provides a data point, an indication of what kinds of content a user will

most likely engage with in the future. This data is funneled back into the News Feed, an infinitely scrolling list of posts and advertisements that an algorithm predicts each user will interact with the most. By displaying this optimized content, each user is more likely to interact with the posts (which generates more behavioral data) and the advertisements (which generates more revenue) (Orlowski, 2020; Zuboff, 2019). With these features keeping users' attention while they are already in the Facebook app or website, still others have been created to pull users away from real life and into the screen, through constant push notifications reminding them of the virtual activity they are missing out on (Orlowski, 2020).

While on the surface these features and practices used by Facebook to increase revenue may seem harmless or actually beneficial to users, the reality is quite the opposite. Usage of Facebook and other social media platforms has been linked to numerous harms to individuals. Most widely known may be the undermining of user privacy. While it is obviously a legal and public policy that Facebook uses user data for targeting advertisements (Facebook, n.d.-a), most users still report feeling nervous about this data collection and feel as if it violates their expectations (Kennedy et al., 2017). Facebook has also been blamed in unauthorized violations of user privacy, including the Cambridge Analytica scandal, in which a researcher was able to harvest and illegally distribute user data to third parties, including political campaigns. As a result, Facebook was fined over $5 billion by US and UK government agencies (Paul, 2019; Romm & Dwoskin, 2018; SEC, 2019), and some users retaliated by spreading a *#DeleteFacebook* hashtag on Twitter (B. X. Chen, 2018). While some people may not care about a loss of privacy, there is evidence of other more tangible harms, including addiction. One study found that levels of Facebook addiction reported by participants were correlated with reductions in brain matter similar to those found in substance and gambling addicts (He et al., 2017).

Adolescents, in particular, demonstrate addictive behavior along with effects like diminished self-esteem and ability to focus (Orlowski, 2020). Also, the growth in popularity of social media platforms generally over the last decade is correlated to an increase in prevalence of depression and suicide among teenagers (Orlowski, 2020).

Facebook has even more concerning effects on society as a whole. These have become especially salient in the last few years, with the onset of the COVID-19 pandemic and the 2020 US presidential election. Misinformation and disinformation have proliferated around topics like vaccinations, masks, COVID-19 itself, election rigging, and voter fraud. Coupled with (until recently) a lack of moderation on Facebook, this has contributed to racial and ethnic violence, like the Myanmar genocide (Mozur, 2018). Also widely publicized has been increasing ideological polarization, especially in the US (Orlowski, 2020). This effect is directly attributable to the design of Facebook's profit-driven features like News Feed personalization (and to similar features which have cropped up across other platforms). By trying to show users the content they are most likely to engage with, Facebook ultimately fills News Feeds with content expressing views that users already agree with and content that is especially provocative or emotionally charged, regardless of its veracity (Orlowski, 2020; Sunstein, 2017; Vaidhyanathan, 2018). The former directly causes polarization by creating "echo chambers" and "filter bubbles", social environments containing only like-minded people where interactions reinforce existing views and reject alternatives (Sunstein, 2017; Vaidhyanathan, 2018). The latter facilitates the proliferation of misinformation, causing fake news to spread six times faster than true news (Vosoughi et al., 2018). Facebook has also shown dangerous potential for deliberate manipulation of society through published experiments that increased voter turnout of a large group of users (Bond et al., 2012) and affected users' emotions without their awareness (Kramer

et al., 2014), all through alterations to the News Feed. These harmful societal impacts, in combination with those at the individual user level, are defects embedded just as deeply in the Facebook platform and business model as the beneficial features, and they warrant solutions.

Mitigation

Facebook has very recently begun to take action to mitigate some of the problems arising on its platform. Concerning the presidential race and election, Facebook began to moderate content that contained misinformation about the election by attaching labels to posts, warning users and directing them to verified sources of information. The company also suspended political ads at sensitive times and began removing posts, blocking their spread, and suspending users for spreading misinformation. In the wake of former President Trump's incitement of the Capitol riot on January 6, Facebook banned his account indefinitely. Similarly, Facebook finally took action in Myanmar after the democratic government was overthrown in a military coup, banning the accounts of military leaders including those who incited the genocide in 2017 (Mozur et al., 2021). Regarding the pandemic, Facebook also began moderating content for misinformation, including adding labels pointing to a COVID-19 information center and reducing the prominence of false items in the News Feed (Facebook, n.d.-b). Concerning more direct change to the core algorithms and features, Facebook recently announced plans to de-emphasize politics on the platform, including reducing the amount of political content appearing in the News Feed and the frequency of recommending political groups to users (Fischer, 2021a). Later, an executive announced new features that would allow users to alter how their News Feed is populated, either by boosting specific kinds of content in the algorithm or by switching to a standard chronological list instead (Fischer, 2021b). While these are reasons for

hope, the effectiveness of these remedies is yet to be determined, and many are technological fixes that do not fully address the root problems inherent in the platform.

Facebook's public relations efforts may be more important to the illusion of mitigation and more widely publicized than its attempted solutions. Facebook, and in particular its CEO Mark Zuckerberg, has faced government bodies many times to answer for the platform's problems and the company's missteps, from privacy scandals and anti-competitive behavior to censorship and misinformation (Browning et al., 2020; Kang et al., 2018, 2019; Romm, 2018). In many cases, Zuckerberg has appeared honest or conciliatory while strategically sticking to rehearsed talking points and avoiding questions (Rankin, 2018), thus obscuring the details that lead to the problems and keeping the public unaware. Little has resulted from these hearings in the form of regulation, and some spectators argue that the limited consequences, like a $5 billion fine by the Federal Trade Commission in 2019, have been insufficient (The New York Times Editorial Board, 2019).

Despite the range of positive effects of Facebook, the negative ones are severe and pressing enough that stronger reform is warranted. Not only does the platform cause direct harm to users, but it also harms society through polarization and misinformation that exacerbate existing problems (for example, racism and white nationalism) and impede progress on other ones, like climate change (Orlowski, 2020). Without the capitalist incentives that drove the development of Facebook in its current form, the platform could change so as to provide the positive effects with less of the negatives. In order to provide these social responsibility-based incentives and to avoid the harms of Facebook, some people have already begun a movement to quit Facebook, either by temporarily abstaining from usage or by deleting their accounts completely. Surveys of US adult users since the onset of this movement did not indicate

widespread adoption; 45% of users said they reduced their usage and 54% said they enhanced their privacy settings, while only 26% said they deleted the app and 8% said they quit altogether (Guynn, 2018; Perrin, 2018). But a study of users who temporarily stopped using Facebook found that it resulted in more in-person socialization, reduced political polarization, and improved subjective well-being (Allcott et al., 2020). By getting more people involved in this movement, it is likely that the negative individual and societal effects of Facebook could be reduced, while the platform itself might be forced to change in response to the loss of users (and revenue).

Methods

In order to help formulate the path towards reforming Facebook, this work aims to understand the current public perception of Facebook in terms of users' motivations for using or quitting the platform, and their awareness and concern regarding the platform's inner workings, practices, and impacts. To accomplish this, several methods are used.

Literature review is used to examine and interpret past work related to this research question. Scholars from science and technology studies, media studies, sociology, and other disciplines have looked at various aspects of this issue, including behaviors around leaving Facebook, perceptions of privacy while using the platform, and reactions to the company's social experiments and scandals (Baumer et al., 2013; Eslami et al., 2015; Hallinan et al., 2020; Powers, 2017; Rader, 2014; Rader & Gray, 2015). Likewise, independent organizations like Pew Research Center have surveyed the public about Facebook, including how knowledgeable people are of how it works (Auxier, 2020; Auxier et al., 2019; Hitlin & Rainie, 2019; Raymond, 2019). These findings will be synthesized to draw conclusions about the user side of the problem.

Actor-Network Theory (ANT) is used to frame the analysis and to clarify the actors involved in this problem and the relationships between them. This theory, developed by sociologists Michel Callon, Bruno Latour, and John Law, treats living and non-living entities as actors that interact with each other in a network (Cressman, 2009; Law, 1992). It emphasizes the importance of relationships between actors in a sociotechnical system, rather than just the actors themselves, and it asks how these relationships are established, how they work, what their effects are, and how they change. ANT has been applied across many fields and cases, including with regards to social media platforms as sociotechnical systems (van Dijck, 2013). In this case, ANT is appropriate, as opposed to theories like social construction of technology, because the division of the social and the technical into actors and relationships enables more granular analysis. Critics of ANT argue that there is subjectivity and difficulty in deciding what should or should not be included in the network, and in the extreme, the network risks becoming infinite and/or of little value. To mitigate these concerns, the theory is carefully applied with a limited set of key actors. These actors are chosen to form the minimal set that defines the influences between the public and the Facebook platform, along with some elaboration of the nonhuman components that make up the platform (such as data, content, and algorithms) in order to elucidate aspects of its nature.

Results

Actor-Network Analysis

ANT was used to identify and interpret the relationships between stakeholders in the Facebook company and platform. The resulting ANT diagram is shown in Figure 1 below. The key actors are the public (divided into users and non-users), regulators, advertisers, the Facebook

platform, the company itself, and its shareholders. These actors were chosen to isolate the relationships that best characterize how Facebook works and how it affects society.

In the Facebook actor-network, the public includes two distinct actors, users and non-users. Users are those who use the Facebook platform, which involves both the consumption of advertisements and content, as well as the allocation of users' attention and personal data to the platform. The links between the Facebook platform and these two aspects of users illustrate an important fact of Facebook and social media in general: once one becomes a user, one no longer has full control over one's own attention and personal data. Non-users do not share any of these relationships with the Facebook platform, giving them more control over themselves and their data (to the extent that that control is not ceded to other companies or governments), but they are inextricably linked to users by living in the same society. This illustrates the societal effects of Facebook being transmitted through users to everyone else. A relationship between users and themselves is also shown to emphasize the user-user relationships that have benefits, like social connection and communication, as well as harms, like polarization.

On the Facebook side, the platform itself is powered by algorithms, both of which are

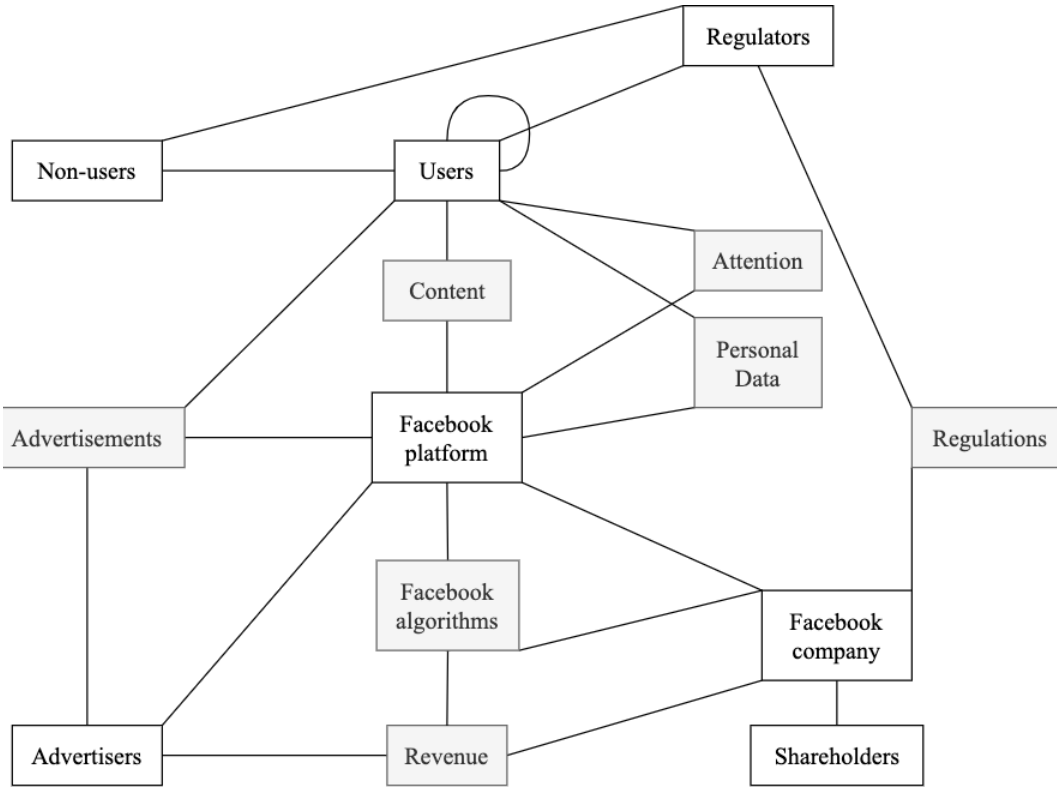

Figure 1: Actor-network of the Facebook platform and its stakeholders

created by the company. It is the power of algorithms combined with user data and attention that drives the advertising business and thus Facebook's revenue. Shareholders are the only immediately related human actors to the Facebook company, which illustrates that in practice, as a public company, its primary duty is to its shareholders and their investments, not to society overall. Besides some overlap with shareholders, the main human link between the public (users and non-users) and the Facebook company is through regulators (namely, governments). Regulations, like the European Union's General Data Protection Regulation, and the threat of regulation—demonstrated by Congressional hearings, for example (Browning et al., 2020; Kang et al., 2018, 2019; Lima & Overly, 2020; Paul, 2020)—are currently the main motivations behind Facebook actions to protect the public.

Given that ANT concerns not only what relationships exist but how relationships are built and broken, there are several real and hypothetical relationships to consider for this thesis. The first two will be called *Users–Platform* and *Users–Algorithms*, and they represent users' knowledge about how the Facebook platform works and how its algorithms work, respectively. To elaborate the distinction between these, how the platform works can be thought of as how user data and attention are collected by the Facebook app or website. Meanwhile, how the algorithms work can be thought of as how that user data is processed to get results—like News Feed content and group recommendations—that are fed to the platform. These relationships are absent from the actor-network, as shown in Figure 1. The reason for this is that by default, users cannot transparently see how their data is collected nor how algorithms turn it into predictions that power the platform. Besides the fact that users on the Facebook platform are primarily interacting with content (posts, groups, messages, etc.) and advertisements, much of the data collection through the platform happens outside of users' awareness, with data points gathered and sent in the background to Facebook's servers. The Facebook algorithms are even more opaque and behind the scenes because they run only in Facebook's data centers, and only the results are shown to users. Without considerable effort and interest, users are unable to learn how their data is being collected and how algorithms process that data, so *Users-Platform* and *Users-Algorithms* do not exist. Establishing these relationships and giving users that knowledge would take more effort and transparency on the part of Facebook to conspicuously explain these things within the app or website. Doing so, however, is probably not in the company's best interest; users, when presented with thorough descriptions of the data collected on them and the characterizations made about them, may become overwhelmed and concerned—as many are already (Auxier et al., 2019; Hitlin & Rainie, 2019)—and decide to engage with the platform less

(Perrin, 2018). But the fact that one side (Facebook) has control over whether these relationships exist or not illustrates a power asymmetry benefitting the Facebook company over users.

Other relationships characterize possible solutions that could mitigate Facebook's negative impacts. One is the *Users-Facebook company* relationship, which is missing from the actor-network because in general, users and Facebook employees do not interact directly and do not have direct influence on each other. Instead, the main ways users might exert influence on the company are through regulators or shareholders. The *Shareholders-Facebook company* relationship is inherent in Facebook being a public company, and typically, shareholders are expecting returns on their investment. This relationship provides the financial incentive that drives Facebook to maximize its revenue, arguably at society's expense. However, a growing movement in the financial world, called ESG (Environmental, Social, and Governance), involves investors seeking to earn not just financial but also environmental and social returns on their investment (Chen, 2021). Under this philosophy, companies that benefit humanity and the world, like clean energy companies, would gain investors, while those that harm or otherwise fail to benefit humanity, like fossil fuel companies, would lose investors. If enough ESG investors could be made to understand the ways Facebook falls on the wrong side of this scale, then Facebook would be directly affected and would be forced to change to respond to the new social incentive.

Alternatively, the creation of the *Users-Facebook company* relationship would provide another direct path for change. The notion that Facebook operations are not already influenced by users is confusing, especially given that many technology companies emphasize the importance of putting the user first when making product decisions. It is probable that users are consulted and used as testers (knowingly or not) for many of Facebook's new products and

features. Still, it may be hard for both employees and test users to predict the kinds of negative impacts that can crop up across individuals and the broader public when new features are scaled up to billions of people. In summary, user feedback during product development may be inadequate, and by establishing a stronger relationship with users after product launch, Facebook could receive and respond to feedback and begin to reduce its negative effects. In the case that test users do provide adequate feedback indicating these potential negative effects, it seems that feedback is often ignored.

This comes down to the financial incentive. The key element of the Facebook business model is the heavy reliance on advertisers for revenue. While users do influence revenue—on average, more users means more advertisement views and clicks, which means more advertising revenue—that influence is not as direct as, say, a subscription-based publication, where each user provides a guaranteed recurring source of revenue. For Facebook, satisfying advertisers is the key to revenue. Because of this, feedback from users that might harm the advertising operation—for example, requests to restrict the News Feed—may be ignored in service of advertisers and Facebook's revenue. This situation illustrates the possible benefit of an alternative business model that abolishes advertisers as actors in the network entirely. In this model, users would pay a subscription fee for use of Facebook services, rather than using them for free with advertisements (which brings the externalities that come with the algorithms and features powering advertisements). While there are drawbacks to the subscription model, it could give users more power, while assuaging privacy concerns and helping to reduce other negative impacts.

Overall, ANT analysis shows that there are a variety of ways for Facebook and its stakeholders to address the problems exacerbated by its current platform and business model. In

order for any of these approaches to be successful, the public must provide pressure, but that is unlikely without most users being aware of the platform's inner workings and impacts.

The actor-network illustrates that there is a power imbalance favoring Facebook over the public, and the company is incentivized to retain that power by not exposing the mechanics and effects of the platform. This result suggests that the onus is on users and non-users alike to inform themselves and each other through means external to the platform.

Public Awareness and Behaviors

Behind the scenes of the refined app and website interfaces with which Facebook users interact, there are many complex technical processes going on, which enable the platform to provide all of its core services as well as to boost revenue by learning user behavior, increasing user engagement, and distributing advertisements. The most important processes to be aware of are the revenue-driving processes because they contribute the most to the negative effects described herein. But those processes, especially data collection and aggregation and personalization algorithms (especially the News Feed), are not understood by many users. In one study, 62.5% of Facebook users were not at all aware of the existence of a News Feed algorithm (Eslami et al., 2015). According to a Pew Research survey, 53% of US adults do not understand why some posts and not others appear in their feed (Smith, 2018). Some studies found a majority of participants were aware of the existence of the algorithm that makes these decisions (Geeng et al., 2020; Monzer et al., 2020; Rader & Gray, 2015), but many participants could not concretely explain how it works (Powers, 2017), and they expressed frustration at the lack of transparency into the algorithm from Facebook (Monzer et al., 2020). After Facebook conducted its experiment in emotional contagion using News Feed algorithm alterations (Kramer et al., 2014), a study examining online reactions to it found many users expressed shock and dismay, evidence

of not only lack of knowledge of how the News Feed works but also fundamental dislike of the algorithmic nature of it (Hallinan et al., 2020).

A similar level of ignorance is found regarding the data collection and aggregation processes, which are used to predict behavior, target advertisements, and inform the News Feed algorithm. While 77% of US adults have heard of these practices across technology companies somewhat, only 6% say they understand a lot about what companies do with the data; 59% of adults say they understand "very little or nothing" about how the data is used (Auxier et al., 2019). The main avenue to learning about this process would be Facebook's privacy policy (Facebook, n.d.-a), but as many as 36% of people say they never read privacy policies when signing up for online services (Auxier et al., 2019). A study of "web-savvy users" of Google and Facebook found that most were aware of simple data collection related to behaviors on those sites, but they were much less aware of data collection and aggregation across multiple third-party sites, which both companies accomplish using their broad networks of advertisers (Rader, 2014).

Along with awareness of how Facebook works, literature review was used to survey awareness of the negative impacts of Facebook. Little has been found about levels of awareness of specific impacts. Monzer et al. (2020) found that users are aware and concerned that News Feed personalization can lead to the creation of filter bubbles and the loss of diversity of thought. In examining reactions to the Facebook emotional contagion study, Hallinan et al. (2020) demonstrated that many users were not—but are now—aware of the potential for behavioral manipulation with the News Feed, with reactions varying from shock and disgust to nonchalance and resignation to the nature of Facebook and other social media platforms. Other work revealed awareness of social media having negative impacts broadly. A survey of US adults found that

64% think social media negatively affects the country (versus 10% saying the effect is positive) (Auxier, 2020). Of that 64%, the participants cited various impacts as the main reason for their judgment, including 28% citing misinformation, 16% citing hate and extremism, 6% citing polarization, and 2% citing privacy issues (Auxier, 2020). Similarly, 24% of US teenagers said social media has a mostly negative effect on their generation, citing cyberbullying most often as the main harm and distraction, addiction, and mental health issues less often (Anderson & Jiang, 2018). Overall, it appears there is some deficit in awareness of the negative impacts of Facebook and that among people who are aware, there is significant concern.

Investigation into users' motivations for using Facebook revealed common and obvious reasons, including connection and communication, staying informed, and entertainment (Anderson & Jiang, 2018; Auxier, 2020). Some work pointed out the presence of network effects, where the ubiquity of Facebook makes it a necessary and default tool for communicating within certain groups (Baumer et al., 2013; Raymond, 2019). On the other side, motivations for quitting Facebook included concern for some of the negative impacts (especially personal and data privacy), distrust of Facebook, loss of interest, and loss of productivity (Baumer et al., 2013; Raymond, 2019). An interesting finding that deserves further investigation is that there are many users that have negative perceptions of Facebook and social media yet continue to use the platform. As already mentioned, a majority of US adults view Facebook's net effect as negative, yet after its recent privacy scandals including Cambridge Analytica, only one in ten survey participants in the US stopped using the platform (Raymond, 2019). The prevalence of distrust and concern among users coupled with relatively lower rates of quitting Facebook points to many users having to make a sacrifice. For example, 81% of Americans say the risks outweigh the benefits regarding companies collecting personal data (Auxier et al., 2019), yet clearly far

fewer are actually quitting and preventing Facebook from collecting their data. Some of these users find that there is no better alternative, nothing else that is free and provides the same ways to connect, share and stay informed (Raymond, 2019), and that the negative effects are simply the cost of using social media (Hallinan et al., 2020).

Limitations

First and foremost, the entire discussion of how Facebook works and what effects it has is based on secondary sources, including research by other scholars about the algorithms and practices and secondhand accounts involving Facebook employees. This fact means that the intricacies and day-to-day changes of the Facebook platform and algorithms cannot be known or accurately reasoned about. However, it is not the details but rather the overall nature and design goals of the platform (which are widely known) that lead to negative effects.

Regarding public perceptions, the analysis is limited by being only descriptive and relying on data from previous work. The analysis may not reflect the most current situation accurately and can only conjecture at causal relationships related to public perceptions, such as through ANT analysis.

Counterarguments

Contrary to this thesis, one might argue that users are largely aware of Facebook's inner workings and its negative impacts, and they continue to use the platform simply because the benefits outweigh the drawbacks. There is merit to this argument as there are clearly some users who are aware of these things, and Facebook is still growing in users and even faster in market value, so it would seem that many perceive greater benefits. The ultimate goal of this thesis, however, is to highlight a path to the eventual reform of Facebook. It seems plausible that some future form of Facebook (and other social media platforms) could exist and provide the same

benefits without the harms. For example, one can imagine a platform that runs as a non-profit or charges subscriptions rather than using the advertising business model. In both cases, the incentives to maximize data collection and user engagement would be less potent, if not absent, which would prevent the creation of echo chambers and spread of misinformation. This thesis identifies the current state of users in the path towards this kind of future. Meanwhile, an argument that the status quo should be maintained because a majority see more benefits than drawbacks is one that hinders social progress; for example, see the opposition to almost any social movement in US history.

Conclusion

Determining the public awareness and behaviors regarding Facebook helps to identify future steps on the path to reforming it and mitigating its negative effects. Since many users lack awareness of how the platform works and increasing that awareness could improve awareness of and concern for the negative impacts (Rader, 2014), efforts should be made to increase public awareness. As illustrated in the ANT analysis, part of this hinges on Facebook's ability to clearly explain its algorithms and processes to its users, but since Facebook has incentives not to change the status quo, the company alone cannot be relied on to provide this education. The responsibility falls to users, non-users, regulators, and other stakeholders, who should work to make everyone more aware of how Facebook works and how it leads to negative effects. Also, efforts should be made to explain all of these effects to more users, and for those users already aware and continuing to use it reluctantly, to show alternative ways to get the benefits of Facebook. These kinds of steps could provide the downward pressure on Facebook's user base and revenues that are needed to accelerate its reform and to alleviate its negative impacts on humanity.

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