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Big Data, Law, and Policy

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Big Tech, Merchants of Doubt?

*Facebook and Social Network Addiction
A Case Study*

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By submitting this work, I Andreas Felderer verify that it is my own, and that I did not use any sources or aids other than the ones referenced.

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1. Introduction

1.1. Motivation

Over the past decades many different industries have fought scientific results, scientists or even science in general, if the scientific results where putting their profits at risk. Some prime examples – outlined among others in oreskes_merchants_2010 and cuveillier_forschung_2020 – are: Big Tobacco (i.e. the largest tobacco companies) contesting the link between (secondhand-) smoking and cancer for decades, Big Oil (i.e.the largest oil companies) contesting the existence of anthropogenic (i.e. man made) climate change, or the agro-chemical industry diverting attention away from pesticides (esp. neonicotinoids[1]) towards other causes in the case of colony collapse disorder (i.e. bee death).

These reports of industries – ruled by few large players – actively fighting scientific evidence over the last couple of decades, raises the question:

> *Does Big Tech engage in similar activities?*

As pointed out in (abdalla_grey_2021), defining Big Tech is not straight-forward, for the scope of this paper, however, a strict definition will not be necessary. The "Big Five" digital technology firms namely: Alphabet (the parent company of Google), Amazon, Apple, Facebook, and Microsoft can serve as a first starting point while keeping in mind that there are many other large and powerful technology companies.

The Big Five alone, have recently[2] been ranked in positions 1, 2, 4, 5, and 6 in in terms of worldwide market capitalization (i.e. the number of shares times the current market price). The only company surpassing some of Big Tech in this ranking was the Saudi Arabian oil company Saudi Amarco (noauthor_largest_2021). Furthermore, all five companies together amount to a market capitalization of $ 8693 trillion (tn) as compared to as compared to the GDP of the USA which was estimated as $22.06 tn in the first Quarter of 2021 (noauthor_gross_2021).

Not only are these companies large and powerful, they also shape the development of this strongly human facing technology. That is they have a large influence in defining the

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[1]Neonicotinoids are chemicals used to protect plants from herbivore (plant eating) insects. The seeds of the plants are coated with these neonicotinoids which later migrate into all parts of the plant, which is why they are also called systemic insecticides. Since these chemicals migrate into all parts of the plant, they also end up in the pollen and this way come in contact with bees where they cause among others reduced foraging and reproduction (whitehorn_neonicotinoid_2012).

[2]As of July 1st 2021.

technologies most humans are using on a daily basis. In 2020 more than 80% of the U.S. population – 18 years and older – owned a smartphone and used it at least once per month, of them 46% reported to use their smartphone between 5 and 6 hours daily, with a general daily average of 3 hours and 6 minutes (noauthor_us_2021; noauthor_smartphone_2021; noauthor_time_2020).

Furthermore, a recent paper addressed the issue of corporate research funding by focusing on Big Tech's[3] funding efforts in Artificial Intelligence (AI)-ethics research (abdalla_grey_2021). The authors studied the influence Big Tech might have on a seemingly "scientific" definition of what is deemed to be ethical AI and what is not[4] and compared some of the strategies with the tactics of Big Tobacco.

1.2. Focus

In this case study I will focus on Facebook and more specifically on the issue of social media addiction or problematic use of Social Network Service (SNS). Facebook is the 6th largest company in the world (in terms of market capitalization), and reports about 2.6 billion (bn) daily and 3.3 bn monthly active people across all of their services (Facebook, WhatsApp, Messenger and Instagram) in 2020. They also report a yearly average revenue per person of $ 27.51 .

> 1: cite

Facebook reported spending 21% of its revenue that is $18'447 million (mn) on research and development in 2020, while it spent 13% ($ 11'591 mn) of its revenue on Marketing and Sales, and reported 8% ($ 6,564 mn) of its revenue to be general and administrative costs. To set the spending on research and development in context, all German higher education institutions together spent €61.01 bn while it earned €32.83 bn in 2019, leaving expenses of €28.18 bn [5] . The state of California spent $41.48 bn on its education system in 2017.

> 2: cite
>
> 3: cite eidgenössische
>
> 4: cite ausgaben (und einnahmen) von hochschulen...
>
> 5: cite higher education spending

Furthermore, Facebook was reported to have spent around $19.6 mn on lobbying in 2020. For comparison in 2020 Amazon spent about $ 18.7 mn, Google $ 8.85 mn, Exxon Mobile (oil) $ 8.69 mn, and Philipp Morris (tobacco) $ 6.95 mn. Finally, Facebook also spent about $ 566 thousand on election campaigning through the Facebook INC PAC .

> 6: cite opensecrets and senate
>
> 7: cite senate and business insider maybe also WSJ

The focus on Facebook is This topic is interesting because a big part of the – as one

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[3]The authors define Big Tech as: "Google, Amazon, Facebook, Microsoft, Apple, Nvidia, Intel, IBM, Huawei, Samsung, Uber, Alibaba, Element AI, OpenAI" (abdalla_grey_2021).

[4]Leaving aside whether there is such a thing as a scientific definition of ethicality.

[5]about $ 31.55 bn at a exchange rate of 1.11957 as of

important player of Big Tech –, the issue of social media addiction and the science of this topic. A reason for me to choose this topic is that while AI-Ethics is very prominent at the moment, it is an inherently ambiguous and normative topic, meaning that there will never be a scientific consensus.

Furthermore, the issue about AI-Ethics funding is being discussed (at least to some extent) pubblicly e.g. in (abdalla_grey_2021) but also in reports about the Facebook-funded AI-Ethics chair at TU-Munich.

I think that the basic metric Facebook is maximizing for i.e. their main goal and driver: "user-engagement" is an important object of study since it constitutes the basis for most of Facebook's decisions, and through this also a considerable amount of time for about 2bn people.

1.3. Relevance for Law and Policy

1.4. Strategies

Oreskes & Conaway present different cases and outline a whole toolkit of strategies to attack science:

These industries pursued different strategies to protect their interest, ranging from:

- Pubblic Relations (PR)

- Denial and publishing in non-peer reviewed "self"-editored journals (creating the apparence of science)

- Creating a cadre of experts to be used in the future. also subsidizing/funding dissent.

- using the balanced reporting imperative of us media

- Diverting research attention (also birds can cause lung cancer)

Also abdalla_grey_2021 looked at the tools ...

It is important to note that while Merchants of Doubt lays out these techniques very clearly, they are not as easy to detect as it may seem. Naomi Oreskes herself reports

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(oreskes_merchants_2010)

- Watching a documentary on Arte (cuveillier_forschung_2020) in a time where I was also attending the Seminar on Big, Data, Law, and Policy sparked the Idea that Big Tech might invoke similar strategies as Big Tobacco or Big Oil (i.e. seeding doubt & diverting attention).

- In the mentioned documentary among others Naomi Oreskes was featured. In her Book "Merchants of Doubt" (oreskes_merchants_2010) – Co-authored with Erik M, Conawy – she lays open some of the tactics that Big Tobacco and Big Oil use to manipulate public perception of scientific consensus.

- Reading up on this I found a recent paper which draws the connection between Big Tech's AI-Ethics funding and Big Tobaccos Strategies (abdalla_grey_2021). This paper also references a hearing at the House Committee on Energy and Commerce, in which former Facebook executive Tim Kendall makes the connection to Big Tobacco stating: "We took a page from Big Tobacco's playbook, working to make our offering addictive at the outset." (kendall_house_2020).

- There is two more prominent former Facebook employees criticizing Facebook for their ethics and the overarching goal to optimize customer engagement: Sean Parker (allen_sean_2017) and Tristan Harris (metz_smartphones_2017).

1.5. Relevance for Big Data, Law, and Policy

1. Policy/Law-making is strongly influenced by public opinion.

2. Especially for restricting regulations/laws solid scientific underpinning has become a very important prerequisite. If Big-tech is now artificially creating "scientific dissent", policy-makers leeway for introducing regulation becomes much more restricted.

3. Thus – because of the potential manipulation by Big Tech and the resulting policy impacts – understanding the modus-operandi of Big Tech is important to inform policy makers and understand the debate.

2. Problematic Use of Social Network Services

2.1. In the Scientific Debate

1. Wording: How is the issue talked about in science?

- Addiction vs. Problematic use

- What are the reasons for using both terms?

2. Scientific findings on (problematic) SNS use (focusing on meta studies):

   - Correlations with different variables

   - Relation to negative effects on well-being

3. The open secret (FB would not openly state this) that Facebook is maximizing user-engagement

   - User engagement is code for time spent on Facebook

   - There is many reports that Facebook prioritizes this above almost anything else (also polarization, depression...) e.g. interviews, and internal documents.

   - Scientificly studied mechanisms keeping users "engaged" are two patterns mentioned in (montag_addictive_2019) namely endless scrolling and showing people what they like[6].

4. Limitations:

   - Correlation vs. Causation (lots of FB => bad mood vs. Bad mood => lots of FB.)

   - Funding of researchers is often not easily found, this makes it difficult to understand which research was under influence of FB => Section 3

   - It is very time consuming / beyond the scope of this case-study to map out the whole scholarly debate and understand how the field evolved over time i.e. understand which papers/authors where influential and how they shaped the following research ... This could be an interesting analysis for a future case study e.g. building a citation graph.

2.2. Facebook's Part in the Debate

1. Facebook avoids talking explicitly about the fact that its aim is to maximize users engagement (i.e. time) on their service.

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[6]I know that some people claim that this in combination with random gratifications is especially powerful, however, I still have to find research on this. Also notifications (esp. frequency) seem to play an important role for engagement.

2. One important argument is that FB brings many advantages you just have to use it right:

   • They present research on this on their blog: active FB usage i.e. messaging makes people feel better; emotional contagion can also happen via FB (kramer_experimental_2014) (one interpretation of the research could be that they where trying to indicate that FB *can* be a substitute for real world interaction)

   • They held a panel during their 2019 global safety and well-being summit (groman_so_2019) where this argumentation was predominant.

   • Moreover on their blog they argue that Facebook can help you in situations of crisis: If you feel depressed just write a message to a friend (facebook_connecting_2020; davis_connecting_2017; facebook_making_2021) the message goes.

3. Another argument is that there is not enough evidence or evidence is not good enough: e.g. in (groman_so_2019).

4. A last argument that is made more subtle is that everyone is responsible themselves and FB should not restrict its users. Again brought forward in (groman_so_2019) but also the underlying idea of (facebook_connecting_2020; davis_connecting_2017; facebook_making_2021).

5. Limitations:

   • It is very difficult to disentangle the effects of smartphones and SNS, and understand where exactly problematic use originates/how it can be tackled. That is, it is difficult to argue against point 2 in this list.

   • It is rather difficult to assess Facebook's position over time: their newsroom page is not too helpful: e.g. searching for "problematic use" results only in 14 entries as of today. Of these 14 posts none is addressing problematic use of Facebook or one of its other services. Moreover, the oldest entry is from Sept. 21st 2017.

   • Contrary to the case of Big Tobacco there is no extensive insight into the exact information FB internally has (in terms of scientific findings). There are only few leaks and reports of former employees.

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[7]The paper Facebook got a huge backlash for, because they did not asked for consent and also made people feel worse.

- Finally, finding out about Facebook funding is difficult on a larger scale (Finding out whether researchers where funded by Facebook is difficult, also finding out what projects FB funded is not straightforward).

3. Facebook Funding Deep Dive

As pointed out in the previous section, understanding Facebook's funding policy is difficult. As argued in (abdalla_grey_2021) funding plays an important role, thus I want to do a deep dive on FB's funding policy on a prominent example:

After increasing public concern about polarization, FB "announced USD 2 million in funding for independent research proposals on polarization" (seetharaman_facebook_2020).
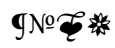
In this section I want to scrutinize this specific funding program in the following dimensions:

- How congruent are the topics set by FB for the funding with the problems of polarization on FB claimed by scientists and the public?

- How transparent are funded researchers about the funding made: Is it visible on their academic CV's and is it mentioned in related papers?

- How congruent are the projects actually funded with the underlying problem?

For this I plan to create a list of the topics set by Facebook and analyze them in terms of their congruence. Furthermore, I want to create a table with the researchers listed on the related FB site and rate them on transparency, assign their project to a topic if possible and asses the congruence with the overall goal.

4. Conclusion

Finally, drawing some conclusions and detailing out the Limitations and open questions of this case study.

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A. Figures

Test 1