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SERVICES FOR SCIENCE AND EDUCATION

Cyber-Physical Social Media Platforms and Their Market Influence

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ABSTRACT

Based on theories of political economy, this essay will examine existing power structures, which are based on proprietary strategies of industrial capitalism and have been transforming into a proliferating networked information economy, decentralizing individual action [1]. Over this course, the author will explain how infrastructural rearrangements modified markets from a considerably static manifestation towards multi-sided platforms, giving social media platforms power over intellectual property and trading informational goods on a transnational scale. In the second part of the essay, the author argues that, first, living in a neoliberalist system also embraces potential and liberal forces, affirming that technology is not the only influencing force in society [2]. However, the main focus of this part insists on resisting the dominance of platforms by exemplifying the far-reaching cultural, political, and institutional impacts of social networks on society. Finally, the author proposes possible future solutions of resistance to find an ethical and democratic way of balancing institutional, political, and cultural aspects to guarantee human freedom and development.

Keywords: Cyber-physical platform, social media, information economy, infrastructural rearrangements, social networks, platformization, communicative capitalism

INTRODUCTION

The concept of an ideal society has been the subject of extensive research long before the digital age. This research has explored the optimal relationship between economy, politics, and markets within a democratic and capitalistic framework. Society is a construct of values, institutions, and social structures where power relationships determine status. However, in the age of globalization, the structures of power need to be reconsidered as they are reshaped continuously by networks, leading to a new form of state: the network state [3]. Digital platforms have enabled the decentralization of individual action and transformed information production, resulting in a networked information economy. However, these platforms have also given rise to platformization and a mediated global capitalist techno culture, where a small number of global players hold significant power over market regulations and society [4]. In this context, the value of individual expression and the worth of information are questioned. This raises the question of whether there is a need to resist this dominance.

How Have Infrastructural Rearrangements Modified Markets?

Long before the digital age, plenty of research has been concerned with the notion of an optimal state of society: how can economy, politics, and markets form an ideal relationship within a democratic and capitalistic framework?

Society is a construct of values, institutions, and specific social structures in which power relationships define their status. Power, mostly pushed through coercion or the construction of meaning, is a capacity that enables social actors to influence the behavior of others to favor their will. According to Max Weber (5), the influence of power is confined by territory, nation, and state. Cultural communities (nations) produce states, marking a specific territory by, amongst other things, using violence [6].

However, in the course of globalization, these structures need to be reconsidered. Borders in almost every form have been redefined, pointing out that over time, national boundaries are only one dimension in which power and counterpower (mostly in the form of resistance) operate [7]. Nations are still a form of social construction but are reshaped continuously by networks (representing a set of interconnected nodes) within the development of a new form of state: the network state [8]. Putting power in a contemporary context shows that it is not a construct situated in one particular sphere or institution but rather operates beyond boundaries based on human exchange, production, and action [9]. According to Jodi Dean, a leading scholar in the political economy, cultural studies and political theory are almost seamlessly connected to one another, including the complexities of media power (mediation) [10]. Outcoming power relationships are often framed by domination (Castells, 2009). According to Max Weber (1922), “power” is the possibility for a social actor to execute his interests despite counterpowers. Domination, however, is, as described above, the architecture in which these power structures can be carried out [11].

Benkler [1] points out that throughout the rise of the internet, information production has been changed radically, leading to a profound structural shift in markets and society, resulting in a so-called networked information economy. Advancing from an industrial model of distribution, physical capital like radio and television transmitters made communication more global but not necessarily more individual [12]. With the new period of networked information economy, non-market mechanisms do not depend on proprietary strategies but characterize decentralized individual action.

Disruptions in technology, the economy, and social systems provided new opportunities for how we exchange knowledge and culture [13]. Platforms, in this case, digital ones, are controversial in themselves and are in a constant state of tension between different paradigms of freedom and control [14]. Narrowing this down, platforms can be described as digital infrastructures, where users can use codes to build software but also apply human use to it (design), serving as a surface for technical innovation and personal development [15]. Being a topos, a residence, where strategic advantages are enabled, platforms have different layers of definition, reaching from computational (system eligible for computers), political (fundament of principles where social actors communicate with the public), or merely architectural (structure where processes take place) [16]. Economically speaking, digital platforms, based on web infrastructure, enable businesses to connect with users and push economic growth

forward [17]. Thus, they can be viewed as multi-sided markets, exchanging information and other commodities between businesses and multiple customers [18]. This overwhelming dominance of digital platforms is defined as "platformization", which involves penetrating economic, governmental, and infrastructural extensions into app and web ecosystems and thus fundamentally affecting the operations of cultural industries [19]. This primarily market-based approach, where computation, communication, and storage put the interconnectivity of cultural production and materialized information in the hands of a small number of global players, embraced a dangerously hegemonial power over market regulations and society [1]. These developments resulted in a mediated global capitalist techno culture, giving social media platforms the opportunity to gain essential insights into the online behavior and interrelated decisions of customers [20].

Additionally, Andersson Schwarz speaks of a platform society, where these operators are intermediaries rather than mediators, developing from a two-way user exchange towards three- and more-dimensional markets [16]. Especially social media platforms, and thus so-called peer-to-peer platforms like YouTube, Facebook, or Twitter, prioritize sharing content and activities between different types of users as a sharing economy to drive transformation in communication. Users have a double role as consumers and producers, collaborating with businesses or the particular network itself [21]. Within this framework, digital intermediaries, in this case, social media platforms, embrace monopolistic tendencies and have the role of gatekeepers regarding information [22]. They need to find the right balance of openness to maintain ownership and deliver value to their key elements [23]. Consequently, this gives social media significant power over data, knowledge, and last but not least, freedom of speech [23]. This multidimensionality does create a user-based sharing and creation economy, enabling creativity but also limiting user participation [16]. Thinking about classic communication models, the message and its understanding are crucial to maintain communication exchange [24].

Communicative Capitalism and Platform Power: The Paradox of Information Exchange and the Implications for Individual Expression

However, communicative capitalism defines the exchange value as much more significant than the message itself. The act of communication and the ongoing flow of information are given precedence in this phenomenon over the actual content or significance of the messages being exchanged:

a) The importance of social media, digital platforms, and the algorithms that control them is what is causing this shift in emphasis. These platforms are built to encourage users to share, repost, and interact with content, frequently without consideration for the information's quality or substance. As a result, rather than the caliber or applicability of the information being communicated, the quantity of exchanges and interactions becomes the main metric for success.
b) This focus on exchange value creates a culture where, regardless of the importance of any given post or message, the main objective is to maintain user engagement and continuous platform contribution. The proliferation of content and the ongoing flow of information as a result fuel communicative capitalism, which downplays the significance of the message itself and places the highest value on the act of communication.

This circulation of content and contribution to a larger pool of information has no necessity for being understood but instead focuses on reproduction, sharing, and repetition [25]. Even though we are aware of the insignificance of individual posts on, for instance, social media, the majority of people act in an opposing way, contributing to communicative capitalism and handing fundamental power to global players [27]. With the help of algorithms and operating systems, digital platforms build a specific strategy to both extend their services, but also to cooperate with other companies. These constant interactions lead to indirect networking effects, automatically increasing platform power [28]. Without major contributions, they almost automatically increase platform sizes and companies, too. It almost seems like a natural process: the number of sellers rises, and with this also come the advantages for buyers [29]. Putting it in a social context, the more users create accounts as well as content, the more social media platforms benefit from it [30].

The problem of "free" services creates the assumption of not paying anything, even though users have to, mostly in the form of their data. Through these effects paired with straight-forward strategies, extending vertical and horizontal power structures, platforms grew fast in dominance and still do [31]. Extending their power in both marketplaces as well as cultural production they turn intellectual property into a materialistic trade commodity [32]. Considering these developments, it becomes clear how the networked information economy questions the worth of individual expression and the value of information [33].

In a momentum of challenge, opportunity, and risk, we need to ask ourselves: Is there a need to resist this dominance?

SYSTEM THEORY APPROACH: IS THERE A NEED TO RESIST THIS DOMINANCE?

Living in a capitalistic system that is not only applicable to one particular market but spreads throughout different divisions, social media platforms embed potential for users and businesses [34]. Michel Foucault views neoliberalism as vigilance, intervention, and activity. Furthermore, he explains that no technological force can fundamentally disrupt the nature of society [35]. However, these innovations, coming from digital platforms, still have imposing effects on cultural and social values throughout their framework of dominance, unifying people, expanding the sphere of influence, and also encouraging participation [36]. Being intermediaries between traditional news distributors, users, and advertisers, social media platforms benefit from economies of scale and scope of operation, putting them in a central position to control extensive amounts of information [37]. Within this system, enterprises gain easy access to customer insights and users on the other hand, can learn more about a product or service through a "neutral" platform [38]. Moreover, algorithms enable people not only to match their preferences but also to experience goods and discover new content based on their allegations, as platforms such as Spotify and Facebook suggest. [39]. Within this framework, a culture of connectivity arose [40]. A formation of memory both influenced by technological and human, constructing a permanent present out of collective and individual, private and public as well as past and future [40; 41].

Equipped with this digital knowledge, global players and companies serving philanthropic causes strive to connect the planet, enabling non-interlinked parts of the world to gain access to the internet [42]. Dominating platforms like Google or Facebook are carrying out plans to

achieve positive developments in especially third-world countries by building urban fiber networks or contracting with broadcast mobile phone operators [43]. Under the slogan "connecting the world", Facebook wants to bring the internet to communities via satellites, claiming that the company's responsibility has expanded [44; 45]. Connecting people with friends and family transformed into connecting the world, carrying a responsibility to build communities and exposing them to new perspectives as a "Community of Practice"(CoP) [46; 47; 48; 49]. Powerful advocacy groups, therefore, glorify the internet as a human right to achieve the world's goals as well as fighting together against climate change or global health problems [50].

In order to accomplish these objectives, economic growth is essential and is often based on trust coming from all users, buyers, and other participants [51]. Through high sums of advertisement and campaigns to maintain their image, social media platforms like YouTube aim to ensure a smooth and repetitive relationship between users and consumers of their services [52]. These developments and strategies give digital platforms undeniable power over firmly established positions in society [53]. Despite the fact that a few powerful companies try to do good in the world, are their goals only based on selfless acts toward humanity, or are they also power-increasing strategies under the guise of tolerance and cosmopolitanism [54]? Moreover, with regard to Habermas, is the image they are presenting only a frame of their real ambition [55]?

UNDER THE GUISE OF TOLERANCE AND COSMOPOLITANISM, POWER-ENHANCING TACTICS

In today's increasingly interconnected world, the pervasive influence of social media platforms on various aspects of our lives has become impossible to ignore [56]. The political economy theories underscore the immense power that these networks wield, impacting not just the social, cultural, and institutional layers of society, but also the political landscape [57]. While platforms like LinkedIn offer valuable opportunities for connection and professional development, the underlying dynamics of communicative capitalism, as discussed by Jodi Dean [58], raise critical questions about the true extent of our agency and the significance of our contributions within these digital spaces. As users increasingly shift their activities to the online realm, they may unknowingly perpetuate passivity and foster the erosion of traditional cultural norms and values [59].

Moreover, the dominance of social media has far-reaching implications for political and democratic processes, with the potential to either promote transparency and critical engagement or manipulate public opinion through targeted messaging and the spread of misinformation [60]. Amidst this complex landscape, governments and regulatory institutions struggle to maintain a balance of power and protect the rights of citizens in the face of rapid technological advancements and the monopolistic tendencies of digital giants like Facebook and Google [61]. This essay will examine the intricate dynamics of communicative capitalism, the challenges it poses to cultural, political, and democratic participation, and the pressing need for resistance against the dominance of social media platforms in order to preserve our individual agency and societal values.

The Illusion of Agency: Unraveling the Impact of social media on Cultural Norms, Values, and the Need for Resistance

The theories of political economy show that the power of networks, especially when it comes to communicative exchanges, on social media platforms reaches significant dimensions of power, influencing social, cultural, political, and institutional layers in society. According to Jodi Dean [58|, these symbols of participation, contribution, and distribution are misleading. The previously mentioned trust is a belief in mattering and the meaning-making of the content generated [62|. Social media gives people the opportunity to connect, share experiences, and build professional careers over platforms like LinkedIn [63|. Social media gives people the opportunity to connect and share user experiences with regard to DIN EN ISO 9241-11 as well as build professional careers over platforms like LinkedIn [64]. However, users are willingly shifting their social, cultural and professional activities to a new online layer, a new social life [65; 66; 48).

Consumers as participative prosumers presume that by clicking a button, liking, or sharing content, they are active and making a difference in manifested opinions [67; 68; 48; 49]. Drawing on Karl Marx's saying, “They did not know, but they are doing it”, Slovenian philosopher Slavoj Zizek refers to their behavior as interpassivity [69]. Content circulation then profoundly involves a passivity that is actively linked and interconnected but still passive [70]. This development leads to a shift of cultural norms and values from the traditional offline society to the sociotechnical norms created in a virtual world [71; 72; 73]. Especially for younger generations growing up in the digital age, the dominance of social networks has a significant impact on their behavior and attitudes [74]. Social media platforms help users stay updated but tempt teenagers to compare themselves to others, letting them slide into social groups with highly negative behavior [75]. Thus, users construct their own social identity, which has nothing to do with reality [76; 77]. Nevertheless, social media networks have not only entered the lives of teenagers but are also a vital part of other generations. Through a certain degree of acceptance and various levels of adjustments, normalization over many layers occurs, viewing social platforms as an established condition to interact without asking or challenging what lies behind the curtain [78]. The complex construct of culture, including historical, economic, and institutional developments, is being macerated [79; 80]. Within the circle of content creation in networks, it seems that understanding society and oneself is not formed within an iterative process but constitutes a collection of codes and texts [81; 82]. This initial state shows how fast personal decisions can become automated, unconscious processes that influence even wider social structures without notice. Looking at a possible socio-cultural decline, we need to find ways to resist and strike a balance between platform powers while maintaining cultural riches [83].

Democracy in the Digital Age: Unveiling the Paradox of Political Participation and the Struggle for Power Balance in Social Media Dominance

Furthermore, the dominance of social media platforms and, thus, the networked information economy have far-reaching effects on political and democratic participation, too [84]. Through a more transparent culture, which affects politics as well, participation on the internet can lead to a more critical and self-reflective culture, endorsing a democratic process. Coming from the industrial era of cultural production, the move to a network economy enhanced the possibilities to make meaning and to be more participative in an individual space [1; 79; 48; 49]. Not only

with standing, but also here, the circulation of political content on social networks mostly consists of branding campaigns coming from political entities. Communicative capitalism merges with capitalism itself, where democracy is inevitable, and with new communication technologies, promising inclusion, participation, and interconnection in the political process.

Nevertheless, political decisions are driven by much more interdependencies than ever-repeating promises and political convictions [86; 87]. Thus, this belief in participation is actually an exclusion of important political processes [88]. Considering the recent US election in 2016, Facebook makes decisions about their new powers and how they can further influence the public and authorities without their specific tools and processes [89]. Being the biggest social network in the world, it got strongly involved in the recent US election in 2016, using targeted messages to interfere in the opinion-making processes of citizens by distributing pro-Clinton content across North America [90]. Still, the emerging filter bubbles and spreading of fake news were perhaps the nubs of the matter regarding Trump's victory [91; 92]. Also, scholar Yochai Benkler views society as limited when it has "no wheel and no writing." Indeed, digital platforms hold federal property through their ever-emerging codes, ruling online communication and their creation to an enormous degree [1]. This could lead to dangerous interferences in the democratic process of politics coming from platforms. In a worst-case scenario, networks could determine the future of nations instead of the population, electing their leaders. As democracy itself is founded on finding a harmonic balance of power structures, it becomes evident how important it is to resist external dominance. The force of social media platforms has major influences on cultural and political aspects while also forcing legislative and other governmental forces to act due to their power [91].

According to scholar van Dijck, the European digital market strategy hasn't had a clear consensus on which policy regarding these issues to choose. In the course of platformization and the market-dominating, monopolist gatekeeper position of companies like Google or Facebook about (private) information and intellectual property, governmental institutions are stuck in a dilemma about how to limit the dominance of digital platforms [40]. A company can, for instance, change their terms and conditions before legal forces can examine their corrections and adjust their framework of action [92]. Transparency and privacy are two of the main concerns of modern public policy. Against this backdrop, governments and regulating institutions struggle to hold their position in society as well as assert themselves in the market for personal information [93]. Even though the European Union strongly articulates that diverse digital content should be accessible, a certain degree of monitoring in this digital ecology is also required with regard to ChatGPT and other generative AI. [94; 95; 96; 97].

Statistical facts like a low degree of media literacy in the EU (39% of citizens have no or low digital skills) or companies not using big data analytics (about 7% of companies with more than ten employees implemented big data into their system) make this task difficult [98; 99; 100]. Through these developments, most governmental institutions are paralyzed by their own bureaucratic apparatuses and rather slow adjustments towards a fast-paced digital ecology ruled by, among others, Facebook and Google [101; 102]. Observing all of the arguments listed above, it becomes clear that there is a need to resist the power and dominance of existing social media platforms. Living in the fast-moving shifts of the networked information economy,

caught within the framework and fantasies of communicative capitalism, is there still a possibility to resist, or are we already instruments of Facebook & Co.?

CONCLUSION: IN REGARDS TO FACEBOOK AND CO., IS IT STILL POSSIBLE TO RESIST CYBER-PHYSICAL SYSTEMS?

Through continuous educational work pointing out the dangers of social media, current statistics show that Generation Z, today's teenagers, isn't greatly tempted to fall into the habits laid out by social networks. They criticize a lack of authenticity and dishonesty when it comes to online social images. Furthermore, the artificial and non-real relationships on digital platforms are an issue young people are distancing themselves from [103]. It seems that at least young users are shifting their everyday activities from the online environment offered by platforms back to the offline world [40]. Furthermore, regarding political and institutional resistance, governments are charging sanctions against social networks and their overshadowing power as well as against their political activities, not taking responsibility for fake news. The European Commission plans to press charges against big technology companies such as Facebook, Google, and Amazon. Because most of their operations in Europe are only charged low taxes, future taxes will climb up to 3% if they make money from user data [104; 105; 106; 107]. The objective here is to limit their dominance and contain the long-term threat to the European tax base [108]. Furthermore, the German government passed a law (Netzwerkdurchsetzungsgesetz), making efforts to assign social media networks their responsibility to take care of fake news and their influence on the latest political elections [108]. After 24 hours, social networks need to have complex, law-breaking cases removed if they do not want to face fines amounting up to 50 million euros [109; 110].

References

[1]. Y. Benkler, The Wealth of Networks: How Social Production Transforms Markets and Freedom. Yale University Press, 2006.

[2]. C. O'Farrell, *Michel Foucault*. SAGE, 2005.

[3]. T. He, L. Ma, A. Swami, and D. Towsley, Network Tomography: Identifiability, Measurement Design, and Network State Inference. Cambridge University Press, 2021.

[4]. S. Octobre, Youth Technoculture: From Aesthetics to Politics. BRILL, 2020.

[5]. C. Brennan, Max Weber on Power and Social Stratification: An Interpretation and Critique. Routledge, 2020.

[6]. L. D. Edles and S. Appelrouth, Sociological Theory in the Classical Era: Text and Readings. SAGE Publications, 2020.

[7]. G. Thompson, *Globalization Revisited*. Routledge, 2014.

[8]. S. G. Glisic and B. Lorenzo, Artificial Intelligence and Quantum Computing for Advanced Wireless Networks. John Wiley & Sons, 2022.

[9]. P. Gale, Your Network Is Your Net Worth: Unlock the Hidden Power of Connections for Wealth, Success, and Happiness in the Digital Age. Simon and Schuster, 2013.

[10]. J. Dean, *Cultural Studies and Political Theory*. Cornell University Press, 2018.

[11]. I. Szelenyi, "Weber's theory of domination and post-communist capitalisms," *Theory and Society*, vol. 45, no. 1, pp. 1–24, Feb. 2016, doi: 10.1007/s11186-015-9263-6.

[12]. S. S. Chapman, "Guerrilla Television in the Digital Archive," *Journal of Film and Video*, vol. 64, no. 1–2, p. 42, Apr. 2012, doi: 10.5406/jfilmvideo.64.1-2.0042.

[13]. H. L. Root, Networking History: East vs. West in a Complex Systems Perspective. Cambridge University Press, 2020.

[14]. M. A. I. Resources, Media Controversy: Breakthroughs in Research and Practice: Breakthroughs in Research and Practice. IGI Global, 2019.

[15]. A. Benardou, E. Champion, L. Hughes, and C. Dallas, *Cultural Heritage Infrastructures in Digital Humanities*. Digital Research in the Arts and Humanities, 2019.

[16]. J. A. Schwarz, "Platform Logic: An Interdisciplinary Approach to the Platform-Based Economy," *Policy & Internet*, vol. 9, no. 4, pp. 374–394, Dec. 2017, doi: 10.1002/poi3.159.

[17]. N. Friederici, S. Ojanperä, and M. Graham, "The Impact of Connectivity in Africa: Grand Visions and the Mirage of Inclusive Digital Development," *EJISDC: The Electronic Journal on Information Systems in Developing Countries*, vol. 79, no. 1, pp. 1–20, Feb. 2017, doi: 10.1002/j.1681-4835. 2017.tb00578.x.

[18]. D. M. Evans and R. Schmalensee, *The Antitrust Analysis of Multisided Platform Businesses*. Oxford University Press, 2014. doi: 10.1093/oxfordhb/9780199859191.013.0018.

[19]. D. B. Nieborg and T. Poell, "The platformization of cultural production: Theorizing the contingent cultural commodity," *New Media & Society*, vol. 20, no. 11, pp. 4275–4292, Apr. 2018, doi: 10.1177/1461444818769694.

[20]. "Communicative Capitalism: Circulation and the Foreclosure of Politics," in *The MIT Press eBooks*, The MIT Press, 2008. doi: 10.7551/mitpress/7687.003.0006.

[21]. D. Tambini and M. L. Moore, *Digital Dominance: The Power of Google, Amazon, Facebook and Apple*. Oxford University Press, 2018. [Online]. Available: https://eprints.lse.ac.uk/87503/

[22]. J. Pedro-Carañana, D. Broudy, and J. Klaehn, *The Propaganda Model Today: Filtering Perception and Awareness*. University of Westminster Press, 2018.

[23]. J. Hartley, *The Uses of Digital Literacy*. Routledge, 2017.

[24]. L. C. Bollinger, E. H. L. D. S. P. G. R. Stone, and G. R. Stone, *social media, Freedom of Speech, and the Future of Our Democracy*. Oxford University Press, 2022.

[25]. J. Grenny, K. Patterson, R. McMillan, A. Switzler, and E. Gregory, *Crucial Conversations: Tools for Talking When Stakes are High, Third Edition*. McGraw Hill Professional, 2021.

[26]. A. S. Taylor, Authenticity as Performativity on social media. Springer Nature, 2022.

[27]. D. J. Hill, *The Pathology of Communicative Capitalism*. Palgrave Macmillan, 2015. doi: 10.1057/9781137394781.

[28]. B. Pon, T. Seppälä, and M. Kenney, "Android and the demise of operating system-based power: Firm strategy and platform control in the post-PC world," *Telecommunications Policy*, vol. 38, no. 11, pp. 979–991, Dec. 2014, doi: 10.1016/j.telpol.2014.05.001.

[29]. U. Ramanathan, N. Subramanian, and G. Parrott, "Role of social media in retail network operations and marketing to enhance customer satisfaction," *International Journal of Operations & Production Management*, vol. 37, no. 1, pp. 105–123, Jan. 2017, doi: 10.1108/ijopm-03-2015-0153.

[30]. J. Guo, N. Liu, Y. Wu, and C. Zhang, "Why do citizens participate on government social media accounts during crises? A civic voluntarism perspective," *Information & Management*, vol. 58, no. 1, p. 103286, Jan. 2021, doi: 10.1016/j.im.2020.103286.

[31]. D. Tambini and M. L. Moore, *Digital Dominance: The Power of Google, Amazon, Facebook and Apple*. Oxford University Press, 2018. [Online]. Available: https://eprints.lse.ac.uk/87503/

[32]. M. V. Jones, "Satire, social media and revolutionary cultural production in the Bahrain uprising: From utopian fiction to political satire," *Communication and the Public*, vol. 2, no. 2, pp. 136–153, May 2017, doi: 10.1177/2057047317706372.

[33]. M. Granovetter, "The Impact of Social Structure on Economic Outcomes," *Journal of Economic Perspectives*, vol. 19, no. 1, pp. 33–50, Feb. 2005, doi: 10.1257/0895330053147958.

[34]. S. Allern and E. Pollack, "Journalism as a public good: A Scandinavian perspective," *Journalism: Theory, Practice & Criticism*, vol. 20, no. 11, pp. 1423–1439, Nov. 2019, doi: 10.1177/1464884917730945.

[35]. M. Foucault, M. Senellart, F. Ewald, A. Fontana, A. I. Davidson, and G. Burchell, *The Birth of Biopolitics: Lectures at the Collège de France, 1978-1979*. 2008.

[36]. C. E. Helfat and R. S. Raubitschek, "Dynamic and integrative capabilities for profiting from innovation in digital platform-based ecosystems," *Research Policy*, vol. 47, no. 8, pp. 1391–1399, Oct. 2018, doi: 10.1016/j.respol.2018.01.019.

[37]. A. H. Gandomi and M. Haider, "Beyond the hype: Big data concepts, methods, and analytics," *International Journal of Information Management*, vol. 35, no. 2, pp. 137–144, Apr. 2015, doi: 10.1016/j.ijinfomgt.2014.10.007.

[38]. R. Mansell, "The public's interest in intermediaries," *Info*, vol. 17, no. 6, pp. 8–18, Aug. 2015, doi: 10.1108/info-05-2015-0035.

[39]. T. Bucher, "The algorithmic imaginary: exploring the ordinary affects of Facebook algorithms," *Information, Communication & Society*, vol. 20, no. 1, pp. 30–44, Jan. 2017, doi: 10.1080/1369118x.2016.1154086.

[40]. J. Van Dijck, "The culture of connectivity: a critical history of social media," *Choice Reviews Online*, vol. 50, no. 12, pp. 50–6579, Jul. 2013, doi: 10.5860/choice.50-6579.

[41]. K. M. Ok, "Toward the Rational Design of Novel Noncentrosymmetric Materials: Factors Influencing the Framework Structures," *Accounts of Chemical Research*, vol. 49, no. 12, pp. 2774–2785, Nov. 2016, doi: 10.1021/acs.accounts.6b00452.

[42]. T. A. Farley, H. S. Halper, A. Carlin, K. M. Emmerson, K. N. Foster, and A. R. Fertig, "Mass Media Campaign to Reduce Consumption of Sugar-Sweetened Beverages in a Rural Area of the United States," *American Journal of Public Health*, vol. 107, no. 6, pp. 989–995, May 2017, doi: 10.2105/ajph.2017.303750.

[43]. N. Friederici, S. Ojanperä, and M. Graham, "The Impact of Connectivity in Africa: Grand Visions and the Mirage of Inclusive Digital Development," *EJISDC: The Electronic Journal on Information Systems in Developing Countries*, vol. 79, no. 1, pp. 1–20, Feb. 2017, doi: 10.1002/j.1681-4835.2017.tb00578.x.

[44]. P. Tess, "The role of social media in higher education classes (real and virtual) – A literature review," *Computers in Human Behavior*, vol. 29, no. 5, pp. A60–A68, Sep. 2013, doi: 10.1016/j.chb.2012.12.032.

[45]. D. G. Kirkpatrick, "The Facebook effect: the inside story of the company that is connecting the world," *Choice Reviews Online*, vol. 48, no. 04, pp. 48–2179, Dec. 2010, doi: 10.5860/choice.48-2179.

[46]. W. Peeters and M. Pretorius, "Facebook or fail-book: Exploring 'community' in a virtual community of practice," *ReCALL*, vol. 32, no. 3, pp. 291–306, Sep. 2020, doi: 10.1017/s0958344020000099.

[47]. G. Vindigni, Organisation and Management of Information Processes in the German Games Industry: The Significance of Customer Review and Recommender Systems for the Innovation Process in the German Games Industry. 2020.

[48]. G. Vindigni, Integrativer Innovationstransfer in der Games- und Kreativwirtschaft. 2021.

[49]. G. Vindigni, Integrativer Wissenstransfer in der Games- und Kreativwirtschaft. 2021.

[50]. E. A. Gage-Bouchard, S. LaValley, M. A. Mollica, and L. K. Beaupin, "Cancer Communication on Social Media," *Cancer Nursing*, vol. 40, no. 4, pp. 332–338, Jul. 2017, doi: 10.1097/ncc.0000000000000418.

[51]. G. D. Saxton and L. Wang, "The Social Network Effect," *Nonprofit and Voluntary Sector Quarterly*, vol. 43, no. 5, pp. 850–868, Oct. 2014, doi: 10.1177/0899764013485159.

[52]. M. A. Shareef, B. Mukerji, Y. K. Dwivedi, N. P. Rana, and R. Islam, "Social media marketing: Comparative effect of advertisement sources," *Journal of Retailing and Consumer Services*, vol. 46, pp. 58–69, Nov. 2017, doi: 10.1016/j.jretconser.2017.11.001.

[53]. L. I. Labrecque, "Fostering Consumer–Brand Relationships in Social Media Environments: The Role of Parasocial Interaction," *Journal of Interactive Marketing*, vol. 28, no. 2, pp. 134–148, May 2014, doi: 10.1016/j.intmar.2013.12.003.

[54]. S. Žižek, "Tolerance as an Ideological Category," *Critical Inquiry*, vol. 34, no. 4, pp. 660–682, Apr. 2008, doi: 10.1086/592539.

[55]. J. Habermas, "Political Communication in Media Society: Does Democracy Still Enjoy an Epistemic Dimension? The Impact of Normative Theory on Empirical Research," *Communication Theory*, vol. 16, no. 4, pp. 411–426, Nov. 2006, doi: 10.1111/j.1468-2885.2006.00280.x.

[56]. B. Curtis, S. J. Lookatch, D. E. Ramo, J. McKay, R. Feinn, and H. R. Kranzler, "Meta-Analysis of the Association of Alcohol-Related Social Media Use with Alcohol Consumption and Alcohol-Related Problems in Adolescents and Young Adults," *Alcoholism: Clinical and Experimental Research*, vol. 42, no. 6, pp. 978–986, Jun. 2018, doi: 10.1111/acer.13642.

[57]. W. S. Jevons, *The Theory of Political Economy*. Palgrave Macmillan, 2013. doi: 10.1057/9781137374158.

[58]. J. Dean, "Communicative Capitalism: Circulation and the Foreclosure of Politics," *Cultural Politics: An International Journal*, vol. 1, no. 1, pp. 51–74, Mar. 2005, doi: 10.2752/174321905778054845.

[59]. C. Folke, T. P. Hahn, P. Olsson, and J. Norberg, "ADAPTIVE GOVERNANCE OF SOCIAL-ECOLOGICAL SYSTEMS," *Annual Review of Environment and Resources*, vol. 30, no. 1, pp. 441–473, Oct. 2005, doi: 10.1146/annurev.energy.30.050504.144511.

[60]. Y. Wang, M. McKee, A. Torbica, and D. Stuckler, "Systematic Literature Review on the Spread of Health-related Misinformation on Social Media," *Social Science & Medicine*, vol. 240, p. 112552, Nov. 2019, doi: 10.1016/j.socscimed.2019.112552.

[61]. J. C. Bertot, P. T. Jaeger, and D. L. Hansen, "The impact of polices on government social media usage: Issues, challenges, and recommendations," *Government Information Quarterly*, vol. 29, no. 1, pp. 30–40, Jan. 2012, doi: 10.1016/j.giq.2011.04.004.

[62]. P. J. Boczkowski, M. Matassi, and E. Mitchelstein, "How Young Users Deal With Multiple Platforms: The Role of Meaning-Making in Social Media Repertoires," *Journal of Computer-Mediated Communication*, vol. 23, no. 5, pp. 245–259, Sep. 2018, doi: 10.1093/jcmc/zmy012.

[63]. J. A. Lovern, "Fat metabolism in fishes," *Biochemical Journal. Cellular Aspects*, vol. 30, no. 11, pp. 2023–2026, Nov. 1936, doi: 10.1042/bj0302023.

[64]. J. A. Naslund, K. A. Aschbrenner, L. A. Marsch, and S. J. Bartels, "The future of mental health care: peer-to-peer support and social media," *Epidemiology and Psychiatric Sciences*, vol. 25, no. 2, pp. 113–122, Jan. 2016, doi: 10.1017/s2045796015001067.

[65]. O. Stickel, C. Ogonowski, T. Jakobi, G. Stevens, V. Pipek, and V. Wulf, "User Integration in Agile Software Development Processes: Practices and Challenges in Small and Medium Sized Enterprises," in *Human-computer interaction series*, Springer Nature, 2016. doi: 10.1007/978-3-319-32165-3_2.

[66]. T. Geis and G. Tesch, Basiswissen Usability und User Experience: Aus- und Weiterbildung zum UXQB® Certified Professional for Usability and User Experience (CPUX) – Foundation Level (CPUX-F). dpunkt.verlag, 2019.

[67]. C. Yuen *et al.*, "A motivational game-theoretic approach for peer-to-peer energy trading in the smart grid," *Applied Energy*, vol. 243, pp. 10–20, Jun. 2019, doi: 10.1016/j.apenergy.2019.03.111.

[68]. F. P. Sioshansi, Consumer, Prosumer, Prosumager: How Service Innovations will Disrupt the Utility Business Model. Academic Press, 2019.

[69]. R. Johnsen, S. L. Muhr, and M. Pedersen, "The frantic gesture of interpassivity," *Journal of Organizational Change Management*, vol. 22, no. 2, pp. 202–213, Apr. 2009, doi: 10.1108/09534810910947217.

[70]. J. J. McCarthy, P. Wright, J. Wallace, and A. Dearden, "The experience of enchantment in human–computer interaction," *Personal and Ubiquitous Computing*, vol. 10, no. 6, pp. 369–378, Sep. 2006, doi: 10.1007/s00779-005-0055-2.

[71]. D. McQuail, McQuail's mass communication theory. 2000.

[72]. S. Pigg, "Coordinating Constant Invention: Social Media's Role in Distributed Work," *Technical Communication Quarterly*, vol. 23, no. 2, pp. 69–87, Mar. 2014, doi: 10.1080/10572252.2013.796545.

[73]. K. Fitch and J. Motion, Popular Culture and Social Change: The Hidden Work of Public Relations. Routledge, 2020.

[74]. M. Kaya and R. Alhajj, Influence and Behavior Analysis in Social Networks and Social Media. Springer, 2018.

[75]. J. S. Davis, Building a Professional Teaching Identity on Social Media: A Digital Constellation of Selves. Springer, 2016.

[76]. Á. Dunne, M.-A. Lawlor, and J. Rowley, "Young people's use of online social networking sites – a uses and gratifications perspective," *Journal of Research in Interactive Marketing*, vol. 4, no. 1, pp. 46–58, Mar. 2010, doi: 10.1108/17505931011033551.

[77]. P. Charoensukmongkol, "The Impact of Social Media on Social Comparison and Envy in Teenagers: The Moderating Role of the Parent Comparing Children and In-group Competition among Friends," *Journal of Child and Family Studies*, vol. 27, no. 1, pp. 69–79, Jan. 2018, doi: 10.1007/s10826-017-0872-8.

[78]. D. Winseck and D. Y. Jin, The Political Economies of Media: The Transformation of the Global Media Industries. 2017.

[79]. P. Berthon, L. Pitt, K. Plangger, and D. Shapiro, "Marketing meets Web 2.0, social media, and creative consumers: Implications for international marketing strategy," *Business Horizons*, vol. 55, no. 3, pp. 261–271, May 2012, doi: 10.1016/j.bushor.2012.01.007.

[80]. T. Leaver, T. Highfield, and C. Abidin, *Instagram: Visual Social Media Cultures*. Polity, 2020.

[81]. L. Hjorth and S. Hinton, *Understanding Social Media*. SAGE, 2019.

[82]. N. Couldry, "Media, society, world: social theory and digital media practice," *Choice Reviews Online*, vol. 51, no. 02, pp. 51–0690, Sep. 2013, doi: 10.5860/choice.51-0690.

[83]. S. M. Iacus and G. Porro, *Subjective Well-Being and Social Media*. CRC Press, 2021.

[84]. A. N. Khan, A. Ali, N. A. Khan, and T. Islam, *Dark and Bright Side of Social Media in Current Normal*. Frontiers Media SA, 2022.

[85]. F. Gilardi, "The Institutional Foundations of Regulatory Capitalism: The Diffusion of Independent Regulatory Agencies in Western Europe," *Annals of the American Academy of Political and Social Science*, vol. 598, no. 1, pp. 84–101, Mar. 2005, doi: 10.1177/0002716204271833.

[86]. B. K. Sovacool, B. K. Sovacool, T. Schwanen, and S. Sorrell, "The Socio-Technical Dynamics of Low-Carbon Transitions," *Joule*, vol. 1, no. 3, pp. 463–479, Nov. 2017, doi: 10.1016/j.joule.2017.09.018.

[87]. B. E. Wood, "Excluded citizens? Participatory research with young people from a 'failing' school community," *Children's Geographies*, vol. 14, no. 3, pp. 310–324, May 2016, doi: 10.1080/14733285.2015.1043515.

[88]. C. J. Galdieri, J. C. Lucas, and T. S. Sisco, *The Role of Twitter in the 2016 US Election*. Springer, 2017.

[89]. O. B. Epstein, Ritual Abuse and Mind Control: The Manipulation of Attachment Needs. Routledge, 2018.

[90]. D. Tambini and M. L. Moore, *Digital Dominance: The Power of Google, Amazon, Facebook and Apple*. Oxford University Press, 2018. [Online]. Available: https://eprints.lse.ac.uk/87503/

[91]. A. P. Heldt, "Reading between the lines and the numbers: an analysis of the first NetzDG reports," *Internet Policy Review*, vol. 8, no. 2, Jun. 2019, doi: 10.14763/2019.2.1398.

[92]. R. Mansell, "The public's interest in intermediaries," *Info*, vol. 17, no. 6, pp. 8–18, Aug. 2015, doi: 10.1108/info-05-2015-0035.

[93]. R. Montes, W. Sand-Zantman, and T. Valletti, "The Value of Personal Information in Online Markets with Endogenous Privacy," *Management Science*, vol. 65, no. 3, pp. 1342–1362, Mar. 2019, doi: 10.1287/mnsc.2017.2989.

[94]. M. Brkan and E. Psychogiopoulou, *Courts, Privacy and Data Protection in the Digital Environment*. Edward Elgar Publishing, 2017.

[95]. R. Kazemi, General Data Protection Regulation (GDPR). tredition, 2018.

[96]. E. Müller et al., Praxisratgeber: Künstliche Intelligenz: Wie Chatbots & Co. den Unterricht verändern. Klett / Kallmeyer, 2023.

[97]. "OpenAI." https://openai.com/

[98]. "EUR-Lex - 52015SC0100 - EN - EUR-Lex." https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52015SC0100

[99]. M. Cernison and A. Ostling, Measuring Media Literacy in the EU: Results from the Media Pluralism Monitor 2015. 2017.

[100]. D. Frau-Meigs, I. Velez, and J. F. Michel, Public Policies in Media and Information Literacy in Europe: Cross-Country Comparisons. Taylor & Francis, 2017.

[101]. G. Els, Corporate Finance: A South African Perspective. 2020.

[102]. A. Ghermandi and M. B. Sinclair, "Passive crowdsourcing of social media in environmental research: A systematic map," *Global Environmental Change-human and Policy Dimensions*, vol. 55, pp. 36–47, Mar. 2019, doi: 10.1016/j.gloenvcha.2019.02.003.

[103]. Y. Ji, C. Li, M. North, and J. Liu, "Staking reputation on stakeholders: How does stakeholders' Facebook engagement help or ruin a company's reputation?," *Public Relations Review*, vol. 43, no. 1, pp. 201–210, Mar. 2017, doi: 10.1016/j.pubrev.2016.12.004.

[104]. A. B. Engelbrekt, K. Leijon, A. Michalski, and L. Oxelheim, *The European Union and the Technology Shift*. Springer Nature, 2021.

[105]. deutschlandfunk.de, "Neue Regeln für Facebook, Apple und Co. - EU-Kommission will Tech-Konzerne in die Pflicht nehmen," *Deutschlandfunk*. https://www.deutschlandfunk.de/neue-regeln-fuer-facebook-apple-und-co-eu-kommission-will-100.html

[106]. M. Zottler, "Gegen Facebook, Google & Co.: EU plant Operation am offenen Herzen der IT-Riesen," *https://www.kleinezeitung.at*, Dec. 27, 2021. [Online]. Available: https://www.kleinezeitung.at/politik/aussenpolitik/6078186/Gegen-Facebook-Google-Co_EU-plant-Operation-am-offenen-Herzen

[107]. Datenschutz, "EU plant Ausnahme: Dürfen Facebook und Co. (weiterhin) mitlesen?," *Dr. Datenschutz*, Dec. 2020, [Online]. Available: https://www.dr-datenschutz.de/eu-plant-ausnahme-duerfen-facebook-und-co-weiterhin-mitlesen/

[108]. T. Dzillak, Netzwerkdurchsetzungsgesetz als Vorstoß der deutschen Internetregulierung. Hasskriminalität im Fokus des Gesetzgebers. GRIN Verlag, 2023.

[109]. "The Digital Services Act package," *Shaping Europe's Digital Future*, Apr. 25, 2023. https://digital-strategy.ec.europa.eu/en/policies/digital-services-act-package

[110]. E. Thomasson, "Germany looks to revise social media law as Europe watches," *U.S.*, Mar. 08, 2018. [Online]. Available: https://www.reuters.com/article/us-germany-hatespeech-idUSKCN1GK1BN#

[111]. Hoover, A. and M. Goldbaum, *Locating the optic nerve in a retinal image using the fuzzy convergence of the blood vessels.* Medical Imaging, IEEE Transactions on, 2003. 22(8): p. 951-958.

[112]. Foracchia, M., E. Grisan, and A. Ruggeri, *Detection of optic disc in retinal images by means of a geometrical model of vessel structure.* Medical Imaging, IEEE Transactions on, 2004. 23(10): p. 1189-1195.

[113]. Huiqi, L. and O. Chutatape, *Automated feature extraction in color retinal images by a model based approach.* Biomedical Engineering, IEEE Transactions on, 2004. 51(2): p. 246-254.

[114]. Fritzsche, K.H., *Computer vision algorithms for retinal vessel detection and width change detection*, 2004, Rensselaer Polytechnic Institute: Troy, NY, USA.

[115]. Houben, A.J.H.M., et al., *Quantitative analysis of retinal vascular changes in essential and renovascular hypertension.* Journal of hypertension, 1995. 13(12).

[116]. Wasan, B., et al., *Vascular network changes in the retina with age and hypertension.* Journal of hypertension, 1995. 13(12).

[117]. Koozekanani, D., et al., *Tracking the Optic Nerve Head in OCT Video Using Dual Eigenspaces and an Adaptive Vascular Distribution Model.* Computer Vision and Pattern Recognition, IEEE Computer Society Conference on, 2001. 1: p. 934.