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COMMENTS

Xiaolong ZHENG, Gang ZHOU, Daniel Dajun ZENG

Platform governance in the era of AI and the digital economy

1 Introduction

Companies that supply online services such as Twitter, Weibo, and Taobao are known as platform companies (Gorwa, 2019). Many top companies offer their services through platforms and use Internet technology to facilitate economic transactions, transmit information, connect people, and make predictions (Fenwick et al., 2019). Such platforms cover all areas of society, including politics (Gillespie, 2017), labor relations, cultural production (Scholz, 2016; van Doorn, 2017), and consumption (Nieborg and Poell, 2018). The rapid development of Internet technology has increased the influence of network platforms. Such platforms have changed the rules of global business operations and influenced the global political landscape. Following some high-profile negative events, calls for strengthening the regulation of online platforms and holding them accountable have been growing (Suzor, 2019). For example, the person who killed more than 50 people at the Al Noor Mosque in Christchurch, New Zealand, in 2019 livestreamed the shooting on Facebook. Within hours, hundreds of thousands of versions of the video, some with watermarks or other edits, were reuploaded to sites such as Facebook, YouTube, and Twitter (Sonderby, 2019). In December 2020, a group of investors united on Reddit to raise the stock price of the game company GameStop, thereby short-squeezing institutional investors. In this incident, a large number of financial institutions and retail investors suffered heavy losses. The short-selling company Citron Capital, for example, declared bankruptcy and announced it would not engage in short-selling in the future (Zhou et al., 2021). In addition to the dissemination of harmful content and the generation of collaborative behavior, algorithm discrimination is another type of harmful behavior that is not easily detected on platforms. Laws prohibit discrimination, but the ambiguity of human decision-making often makes identifying discrimination legally difficult (Kleinberg et al., 2018). Examples of such discrimination include differences in gender recruitment rates and the price difference between regular customers and new users. Yet, determining whether an algorithm has performed such discrimination remains difficult. Although platform companies have affected every aspect of people's lives, relatively few studies have investigated platform governance. Negative events have occurred on these platforms, causing disruptions in people's lives and posing challenges for governance. Thus, policymakers need to develop effective policies to regulate platform companies. However, the question of how platforms should be governed is not easy to answer.

This paper is organized as follows. Section 2 introduces the basic concept of platform governance. Section 3 introduces some problems with platforms and the existing platform governance models. Section 4 summarizes the advantages and disadvantages of existing governance models and provides an outlook on directions for future research on platform governance.

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Xiaolong ZHENG (✉), Gang ZHOU, Daniel Dajun ZENG
The State Key Laboratory of Management and Control for Complex Systems, Institute of Automation, Chinese Academy of Sciences, Beijing 100190, China; School of Artificial Intelligence, Chinese Academy of Sciences, Beijing 100190, China
E-mail: xiaolong.zheng@ia.ac.cn

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2 What is platform governance?

Understandings of the term "platform" have changed over time. The earliest appearances of the concept were in the context of computers, computer networking, ARPANET, and early bulletin boards. In the 1990s, software developers defined their products as "platforms" on which code could be developed and deployed, not just software programs. In recent years, the term has been used as shorthand for the services provided by various

technology companies, referring specifically to data-driven online applications and services. In the face of changing social needs, "platforms" can provide users with data, services, and technology, thereby creating public value (Janowski et al., 2018). Stoker (1998) suggested that governance be needed to create ordered rules and collective action conditions. In this context, a platform can be considered a function and a specific, complex interactive network spanning different participants and behaviors.

As an important international regulatory issue, platform governance predominantly aims to make platforms transparent and responsible and to protect the basic rights of users. Platform governance involves participants such as users, governments, and platform companies (Gill et al., 2015). A set of legal, political, and economic relationships should be constructed among those participants to promote the development and advancement of the platform (Gorwa, 2019). In this relationship, rules should be in place regulating the behavior of both platform users and platform companies. Importantly, a platform has the responsibility to formulate good rules to prevent malicious behavior by users. However, a platform should also ensure that competition on the platform is fair and beneficial to users. Given the existence of many participants on a platform, many researchers have regarded platforms as "ecosystems" (Gulati et al., 2012). Governance of a platform ecosystem implies a need to define standards for all participants in the ecosystem (Tiwana et al., 2010). Such standards can help the platform ecosystem operate stably; a good platform governance approach reconciles and balances the contradictions among all participants (Parker and van Alstyne, 2005).

Platform ecosystem governance has two crucial aspects (Tiwana et al., 2010). The first concerns the rules, which should clearly define each participant's rights and obligations to ensure smooth platform operation. Rule design has two important attributes, with the first being the stability of the rules. This means that some essential rules on the platform should not change over time. Thus, participants who join the platform at different times can have the same assumptions about the platform ecosystem without needing to validate those assumptions. However, because these rules cannot adapt over time, they need to be general. The second attribute of the rules is diversity, which refers to the fact that platform rules should aim to increase the diversity and flexibility of participants in the platform ecosystem. Thus, the challenge for decision-makers is to make rules that adequately and consistently bind participants without "overbinding" them.

The second important aspect of platform governance is values (Gulati et al., 2012). This refers to the value propositions that platform participants share and can continuously attract new members, thereby promoting the rapid development of the platform ecosystem. Multiple people with shared values flock to platforms and interact with each other, thereby forming a virtuous cycle and supporting the robust development of the platform ecosystem. Values can make participants consciously abide by rules and assume the corresponding obligations (Ouchi, 1980). Therefore, values should be the most important factor to be considered in platform governance, as well as the most valuable asset of the platform ecosystem. However, most studies have focused on governance rules while showing less interest in values.

3 Problems with platform governance models

Platform governance aims to address phenomena that harm the platform ecosystem. Such phenomena either harm the interests of platform participants, violate laws and regulations, or affect the platform's fairness. These problems damage the environment of an otherwise positive and healthy platform ecosystem. Below, we introduce several typical platform governance problems.

3.1 Problems in practice

3.1.1 Toxic content

Platforms constantly generate content and user communication. Thus, certain types of "content" are always present, such as personal attacks and other offensive remarks, including hate speech, profanity, defamatory claims, bullying, and harassment (Waseem et al., 2017). If such speech is allowed to spread unchecked among users, the platform can lose essential contributors. Gadde and Gasca (2018) referred to such content as "toxic".

3.1.2 Algorithmic discrimination and justice

In the era of big data, data are a fundamental resource, and algorithmic decision-making is the core engine. Data provide the foundation for algorithms and are inherently objective and neutral; however, artificially designed algorithms inevitably imply bias. For example, in the employment field, some groups are often discriminated against by search engines in job promotion and screening. Another example is marketing, in which Internet platforms analyze consumers' purchasing or browsing records, using big data to "profile" them. Then, in the case of providing goods or services of the same quality, "differentiated pricing" is sometimes implemented according to preferences and income levels. Such unfairness in automated algorithmic decision-making is called "algorithmic discrimination" or "algorithmic bias" (Kleinberg et al., 2018).

In recent years, algorithmic discrimination by algorithmic decision-making systems has been examined in

content moderation (Blodgett et al., 2016). If the content involves language or user characteristics, discrimination is likely. Therefore, content classifiers always discriminate against certain groups. Diversifying training data and teaching the model to understand context are critical to reducing bias. Automated auditing systems may not only help detect and quickly eliminate personal attacks but also have the potential to entrench unjust rules in rapid, global, and incomprehensible ways (Kleinberg et al., 2018).

3.1.3 Harmful collaborative behavior

In "collaborative behavior", a group of users embrace a common goal, plan and negotiate through a platform, and then organize to accomplish the same thing together (online or offline) (Whitford et al., 2010). Platforms create a good environment for users to communicate and interact with each other. People can carry out activities such as personnel recruitment, information release, capital turnover, and information dissemination on the platform, thereby providing a breeding ground for collaborative behavior (Boticki et al., 2015). When the nature of such collaborative behavior is harmful, it can have an enormous impact on society. Collaborative behaviors are often difficult to detect, thereby posing difficulties for platform governance. Cyberterrorism is a typical example of harmful collaborative behavior (Marsili, 2019). For example, the cyberterrorist group United Cyber Caliphate (Liang, 2017) often posts messages via the social media platform Telegram to provide information to supporters of the Islamic State terrorist organization. Based on such information, potential extremists or "lone wolves" (Hamm and Spaaij, 2017) can learn ideas, acquire skills, and effectively analyze targets, thereby receiving information and technology that can prepare them for terrorist activities.

3.1.4 Privacy issues

Online platforms record users' identities, account passwords, chat records, browsing history, and payment information. With the development of big data, such records can be easily monitored or queried. Sometimes platforms can leak these information, violating users' privacy. The openness and sharing of online platforms and the transparency, mobility, permanence, and searchability of information make obtaining users' private information easy. However, the anonymity of the Internet and the rapid dissemination of private information make tracing such invasions of privacy difficult.

3.1.5 Copyright

Along with the rapid development of new media and the lowering of content production costs, the operation modes of Internet platforms have been transformed. To cope with the explosive growth of platform content and to meet users' personalized needs, Internet platforms increasingly use deep learning-based algorithmic recommendation technologies to replace manual operation. Today, many platform service providers, such as news, e-commerce, information retrieval, and video entertainment platforms, use algorithmic recommendation technologies as an essential part of their operations. However, the innovation of technical means often comes with the emergence of legal risks. Using algorithms to achieve personalized recommendations, Internet platforms that provide content-sharing services may recommend works that infringe on other users' content. For example, when Google acquired YouTube in 2006, Viacom, the third-largest media company in the US, sued YouTube users for massive copyright infringements, filing a $1 billion claim against YouTube.

3.2 Governance models

Deciding which governance model should be adopted for problems on platforms is a challenge for decision-makers. A good governance model should balance rules and values and address the aforementioned issues (Reddy et al., 2020). Next, we describe several existing governance models.

3.2.1 Self-governance

Self-governance is currently the mainstream approach to platform governance. Autonomy rules are nonnormative documents that apply to the internal activities and behaviors of platforms (Suzor, 2019). Such rules are not guaranteed through coercive state power but reflect "the right to the governance of the network platform" (Haggart and Keller, 2021). They are set by network platform operators under the premise of complying with laws, regulations, public order, and morals. Specifically, self-governance is the externalized expression of the "right to govern online platforms" (Haggart and Keller, 2021). For example, the well-known social networking site Reddit (Anderson, 2015) adopts self-governance, in which each subreddit has autonomy. Thus, different subreddits have different governance rules, which are specified by the subreddit itself. This governance model is subject to slight external oversight (Alexander, 2020). The autonomy model has many advantages. With a plurality of subjects and flexible rule-making, a platform's autonomy rules considerably reduce the costs of rule-making and trial and error and can make timely adjustments and improvements to content in accordance with the needs of platform governance, thereby compensating for the inevitable lag and limitations of algorithms (Sørensen and Triantafillou, 2016). A platform's autonomy rules can also promote platforms' social responsibility and regulatory obligations,

thereby expanding the dissemination of democratic values on the Internet. The autonomy model protects the diversity of values and allows users with different values to assemble in different communities. Yet, the autonomy model also has limitations. First, the legitimacy of autonomy rules is questionable (Gorwa, 2019). Second, the process of autonomy rule-making lacks openness and fairness. In general, self-governance is suitable for social media platforms.

3.2.2 External governance

In the wake of numerous public affairs scandals, massive algorithmic discriminations, and growing concerns about information cocoons and fake news, many have appealed for "external governance" (O'Mahony and Karp, 2022). Given the apparent dissatisfaction with the autonomy model, many countries have passed legislation to tighten platform control. For example, Germany's NetzDG (Gorwa, 2021) and the EU's General Data Protection Regulation (GDPR) (Wachter, 2018) require social media platforms with more than two million users to address inaccurate or inappropriate statements on their platforms within a certain time limit and report on their handling of such statements. Fines are imposed if the platform operators fail to enforce regulations. GDPR, which came into force on May 25, 2018, represents the most significant change in data protection legislation in almost three decades. It aims to strengthen the protection of the personal data and privacy of EU residents. GDPR also simplifies the regulatory framework for multinational companies by harmonizing data and privacy regulations. Twitter and Facebook have faced comprehensive legislative regulation in Germany. Thus, the rules governing them are dominated mainly by law, and only a small number of rules are set by the platforms themselves. This means that both platforms operate under an external governance mode. Strict legislation can harm the platform ecosystem. Nevertheless, some legal researchers believe that to improve platform governance, strong external oversight should be imposed, platform companies should be split up, or future acquisitions should be blocked (Schreieck et al., 2016). Compared with the autonomous model, external governance has enhanced the fairness and rationality of platforms as a result of legal intervention. However, the rules set by laws are generic; thus, the flexibility of rules is reduced. In terms of values, external governance can form positive values but may harm diversity. Given that external governance solves the problem of fairness in self-governance, it is more suitable for e-commerce platforms.

3.2.3 Cogovernance

Cogovernance is the third approach after self-governance and external governance (Li et al., 2022). Under cogovernance, platform governance is not unilaterally led by the law but requires collaboration between governments, online platforms, and individuals. Self-governance has been heavily criticized for giving too much power to corporations (Morozov, 2013), who tend to be mainly concerned with the economic bottom line and less concerned with social and environmental effects (Brinkley, 2015). Cogovernance encompasses "processes and structures of public policy decision-making and management" that engage "public institutions, levels of government, and people in the public, private, and civic spheres" in constructive ways (Gill et al., 2015). People in the public, private, and civic spheres constructively engage to achieve shared goals that cannot be achieved otherwise. In November 2018, for example, Mark Zuckerberg announced that the French government would embed regulators in the country's content policy processes, and Facebook would create a "supreme court" to allow for external appeals of content policy decisions (Cowls et al., 2022). The social media platform Weibo is also under a collaborative governance mode, where the law governs the platform's content and users. Still, the platform's specific rules are set by Weibo. Platform governance requires the active participation of governments, platform organizations, and third-party organizations, as well as the inclusion of a wide range of platform stakeholders in the governance process. Forming a collaborative platform governance mechanism requires establishing consensus regarding the values of platform governance, sorting out the value division among different platform governance subjects, combining the governance capacity of platform governance subjects, and choosing governance methods and tools suitable for the platforms. In the long run, cogovernance can offer users a fair and just digital economy. Cogovernance achieves the best balance in terms of rules and values (Ferlie et al., 2020). Cogovernance can also be considered universal among different platforms. However, in a collaborative governance framework, rules do not necessarily lead to fairness and justice for the platform. In the process of collaborative governance development, the generated rules often focus on the pursuit of spontaneous order. Such a governance network characterized by spontaneous order often does not represent fairness and justice for the platform.

4 Conclusions and discussion

The three management models discussed in this paper emphasize either users or governments. However, platform governance requires the participation of governments, platform organizations, third-party organizations, and major stakeholders. Establishing collaborative platform governance requires consensus regarding values, determining the division of labor, combining the governance

capacity of different subjects, and selecting the correct governance methods and tools (Matias and Mou, 2018).

Platform ecosystems are developing rapidly and dynamically, and governance cannot be perfectly optimized using a single model (Klonick, 2017). We might therefore need to find a new digital governance model. Nooren et al. (2018) suggested that normative and functional governance methods are needed, rather than static governance rules. In other words, we need principle-based governance rather than entirely rule-based governance. An effective approach to platform governance should address complex governance relationships and public policy challenges while considering how to benefit the many rather than the few (Fenwick et al., 2019).

Research on platform governance should focus on the enrichment of governance principles, such as fairness, accountability, transparency, ethics, and responsibility, and how to reflect those values through legislation and accountability mechanisms. Further research on platform governance, principles, and values is crucial for the future development of platform governance. One direction for future research is that because platform companies already have considerable influence in various areas, even in politics, and are pursuing market dominance, creative ideas are needed to help introduce fair, accountable, and equitable forms of platform governance.

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