

Artificial Intelligence in Democracy: Unraveling the Influence of Social Bots in Brexit through Cybernetics

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Abstract. This paper delves into the implications of AI on the democratic process, particularly concerning the manipulation of information flows via cybernetic mechanisms. Through the lens of cybernetics, AI orchestrates information dissemination on web platforms, notably through Social Bots, autonomous programs simulating human behavior to sway public discourse. This study examines how AI's manipulation of information, exemplified by the case of Social Bots in the 2016 UK Brexit referendum, influences democratic participation and election outcomes. Amidst a regulatory landscape characterized by lax oversight, understanding the intricate interplay between AI, cybernetics, and democratic processes is imperative for addressing ethical concerns and safeguarding democratic integrity. This paper underscores the urgency of establishing industry benchmarks to regulate AI's role in shaping public discourse and its consequential impact on democratic decision-making.

Keywords: Artificial Intelligence; Cybernetics; Democratic Process; Social Bots; Information Manipulation; Brexit Referendum.

1. Introduction

The application of AI has penetrated all areas of social life in the era of digital technology. AI has brought not only revolutionary progress but also crises and challenges. With the spread of algorithms and automated systems on web platforms, the impact of AI on the democratic process is becoming more prominent, and there are ethical concerns about its nonnegligible impact. The current regulatory environment for the AI market is very loose and largely private, there is no industry benchmark to constrain the development and use of AI. Therefore, the mechanisms by which AI guides and shapes public discourse, and thus affects the democratic process are at the heart of the concern.

As a study of feedback loops and control in systems, cybernetics provides a suitable framework for AI to manage and manipulate information flows in cyberspace. Social Bots are a form of AI which is an autonomous program that mimics human behavior on a web platform. It uses feedback loops on social platforms to amplify specific narratives that are aligned with the interests of its holders to hide objections and thus influence public judgment. Such information manipulation is likely to mislead democratic participants and even alter election results. The 2016 United Kingdom European Union membership referendum (Brexit) on Social Bots on Twitter is a case in point. Social Bots use feedback loops to shape public discourse to influence voters' decisions at crucial moments in European history. This paper discusses in depth the information manipulation of AI through cybernetics and examines the Brexit case in detail to illustrate the impact and challenges of AI in the field of the democratic process.

2. Literature Review

AI is to simulate human intelligence in a machine and make the machine act like a human by programming. According to Hajli et al. (2021), as a broad branch of computer science, AI has evolved numerous functions through algorithm training and program editing, including computation, optimization, and decision-making. At the same time, the application of AI is also very wide. Whether in health care, manufacturing, finance, or even public initiatives, AI can perform human intelligence

tasks efficiently. This trend of infiltration means that humanity is entering a new period of transformation. However, the complexity and speed of technology development also mean high risk. The growing technological power of AI also represents an increase in its destructive potential (Hendricks et al., 2023).

According to Hendricks et al. (2023), all sectors of society including AI developers, policy makers, and leaders have expressed concern about the rapid development of AI. Because of its short history, the field has yet to undergo a historic transformation, which can produce principles or norms that will unify the industry. Because of its commercial nature, the development of AI is not faced with a unified client goal, so the balance between public and private interests is difficult to maintain (Mittelstadt, 2019). As a result, the lack of principles and the additional ethical costs of using AI have drawn attention to the ethical issues involved.

In recent years, there have been several corporate initiatives around the world that seek to define the values and principles of artificial intelligence concretely, thereby preventing the moral hazard of its irregularity. For example, the four principles endorsed by OECD9 and the European Commission's high-level panel on AI (HLEG) are expected to be directly embedded in the development process, they are respect for human autonomy, protection from harm, fairness and interpretability (Mittelstadt, 2019). These principles are expected to improve the risks of AI use, especially in the area of communication. According to Hendricks et al. (2023), AI can pollute the information ecosystem by creating false information on a large scale and efficiently, which greatly reduces the common understanding of reality. AI will be driven according to the algorithm for Internet users to create information in line with the interests of certain groups of cocoons. Thus, the role of AI in the spread of information is far-reaching.

Cybernetics has a long history of application in communication science, and it can provide a suitable framework for the manipulation of information by AI. In 1948, Norbert Wiener's cybernetics was published, which explained the origin of cybernetics and laid a theoretical foundation for its multidisciplinary development. According to Wiener (2019), research on the control of information flow in systems with feedback loops belongs to cybernetics. This means that cybernetics can provide quite complex observations that can exist in the biological and mechanical domains. Its core elements are information, sending, and responding, that is, feedback. These three constitute a certain balance. With the continuous complement and development of cybernetics, its application has been extended to the social field and has had a close relationship with communication. Many communication departments use it as a basic theory of learning. Cybernetics and media and communication research also have commonalities. As the key concept of cybernetics, feedback loops are widely used in the field of communication. Feedback is a system in which the output of loops of past events or phenomena will affect the occurrence of the same phenomenon at present or in the future. These cycles can be divided into positive feedback and negative feedback, respectively, to enhance and balance the role.

With the advent of the electronic age, cybernetics in the application of communication in the network social media also has a clear reflection. The Internet provides a time-sensitive way for people to communicate without being confined by space, with unlimited interactions through social media (Ross al., 2019). At the same time, social media is also an important way for people to access information, build their communities on different platforms, and exchange and convey information on them. According to Matook, Brown, and Rolf (2015), online interactions are strongly shaped by the social influence of peers in social networks. Therefore, using feedback loops to interact with users is one of the common strategies used to influence the public discourse formed on social networks.

Users are precisely segmented by the social platform when they use it. The platform divides users into groups based on characteristics such as gender and age. Conduct accurate psychoanalysis of users through exposure to user-related material (Kane, 2019). For example, Facebook could create a page filled with content that users might like within seconds, based on the information they provide when they sign up. Users can use the platform's affordance to provide feedback on what the algorithm

recommends, such as likes, retweets, and comments. This increased engagement encourages the algorithm to more accurately capture a user's preferences and push content to them, creating a self-reinforcing cycle. Thus, when certain narratives are amplified, real users may share and participate further, leading to wider dissemination. AI can reinforce false perceptions if it recommends false information or misleading content.

Social Bots is one of the best examples of AI on the social platform, an automated operating program. It takes the form of AI robots that learn and imitate human behavior on social platforms and disguise themselves as real human beings. Social Bots can produce and forward information quickly and in large quantities, so social media is also an important part of strategic management for different industries and organizations (Hajli et al., 2021). According to Ross al. (2019), between 9% and 15% of Twitter accounts are social bots that simulate the behavior of other users and engage in communication with them.

Social Bots learn user behavior and mimic human behavior output by classifying, sorting, and assembling information. A large number of robots post information about an event to create the impression that they are "Astroturfers," and the information is pushed to the target user by the algorithm, making them think that messages sent by social bots are the opinions that most people hold. When a given point of view is amplified, the opposing voices are drowned out.

3. Case Study

In recent years, because of the rise of AI, social media has played a transformative role in shaping public discourse. The intersection of science technology and politics has received unprecedented public attention. The transparency and credibility of political ballots have come under intense scrutiny since the 2016 US election was revealed to have been rigged by AI. Cambridge Analytica employees have accused Donald Trump's team of employing AI services to cheat during the US election, there have also been reports of unusual spending during Brexit in 2016 that pointed to hiring AI to intervene in the outcome of the referendum.

Brexit is a watershed moment in British history and in relations with the European Union. According to Wogu et al. (2021), Twitter as a major battleground for public opinion is subject to political interference. In this political debate, it's not just citizens who are taking part. AI, in the form of Social Bots, is joining the fray, and playing a hidden role. These automated programs, which mimic human users, broadcast strategic narratives on Twitter to amplify certain ideas. This case study examines how social bots interfered with the outcome of the referendum during Brexit and explores whether they have had a more profound impact on the democratic process in the digital age.

4. Background Information of Brexit

Britain's relationship with the European Union is historically complex. Tracing its broad historical context is crucial to understanding the Brexit in 2016.

After the Second World War, the European Coal and Steel Community was established to prevent future conflicts on the continent and to embrace the desire for unity. The European Economic Community that followed symbolized the arrival of economic prosperity in European countries. Britain, however, has not joined them. The British position changed in the 1960s. For development's sake, the British application to join the European Economic Community was initially opposed. However, in 1975, UK officially became the European Economic Community through a referendum with 67% of the votes. This was also the predecessor of the European Union. But the seeds of skepticism highlight Britain's concerns about sovereignty and economic contribution. As the pro-Brexit Independence Party came to power in Britain in 2010, the concern became more pronounced. Cameron, the Conservative Prime Minister, promised at the general election that he would hold a referendum on Brexit if his party won in 2015. Therefore, after the Conservatives' victory in 2015, preparations began for a referendum.

According to Wogu et al. (2021), The word “Brexit” is a combination of Britain and exist. As the name implies, Britain as a polity will be completely separated from the European Union. But the mood is not overwhelming. There was a heated debate ahead of the referendum on Britain's membership in the European Union. “Leave” and “Remain” have formed their campaign groups, active on social networks to change the opinion of voters. In the final referendum, the “Leave” group won by 51.9% of the vote. On January 31, 2020, Britain formally left the European Union, although only 72.2% of its citizens took part in the vote and there were complex provisions to be negotiated between the UK and the EU.

5. Social bots on Twitter and Brexit

British membership of the European Union has been hotly debated on social networking platforms, raising questions about whether artificial intelligence is interfering with public discourse on the topic. There is even a public perception that the outcome of the referendum might have been different if AI had not been used politically (Wogu et al., 2021). These doubts are not unfounded. In the 21st century, the use of AI has become global. Its application in the field of communication has been very common. Some scholars believe that AI provides opportunities and services for many political sectors (Wogu et al., 2021). Social Bots are one of those AI that are supposed to serve political communications.

As a large online social networking platform, Twitter has a market share of 23.8% in the UK, which means it is an important channel for political communication (Bruno et al., 2022). However, between 9% and 15% of Twitter users are not real people, but an automated program that mimics human behavior, known as social bots. The social bots are hidden on Twitter and masquerading as real people. They post a lot of information about a topic based on algorithms to give the illusion of astroturfing. This has had a huge impact on public opinion.

During the Brexit of 2016, there were a lot of social bots on Twitter. These automated accounts have a different division of labor, some spread false news, some spread extremist party news, and some only publish or relay information about one camp. These bots can generate cascading messages from other tweets, and “Brexit” is the main theme of these social bots, judging by the keywords they post or retweet.

According to Howard and Kollányi (2016), the most active users on Twitter make up about 8% of the user base and produce 32% of tweets related to Brexit. This doesn't mean that all of these highly active users are social bots, but without some degree of automation, it's hard for humans to maintain such high levels of social activity. Seven of the 10 most active users surveyed were social bots. Social bots' presence on Twitter adds a lot of information to the pro-brexit crowd. These social bots' high-frequency retweeting and tweeting in the run-up to the referendum magnified the specific pro-brexit narrative. They have consistently promoted specific messages under Brexit themes, such as using pro-brexit labels or pro-brexit arguments, making these arguments more mainstream than they otherwise would have been. This false “Popularity” reinforces the biases of the voters who receive it.

Also, according to Wogu et al. (2021), the number of social bots on Twitter increased significantly from 2% to 11% of users in the week before the referendum, suggesting that it's no coincidence that social bots are involved in public interaction on Twitter, it is because the choice of Brexit camp needs to be amplified. The massive growth of social bots-driven pro-Brexit content will give the impression that pro-Brexit content is mainstream. Voters who do not have a choice are likely to swing to a more “visible” majority a few days before the referendum.

Social Bots on Twitter feed messages related to Brexit discussions to targeted users and manipulate new messages based on feedback from users, such as likes, retweets, and comments. In the process, the information presented to the user is constantly adjusted based on the user's feedback, which can create an information cocoon for the user to believe that the information they are currently exposed to is public opinion. Also, social bots' large number and common accounts can give the targeted user

the illusion of “Astroturfing,” further reinforcing the message's credibility. In this way, the robots can influence the views of real voters through information manipulation.

According to Howard and Kollányi (2016), the extent to which social bots influence the Brexit is hard to gauge. But what is certain is that social bots did play a role in political communications in support of Brexit.

6. Ethical Consideration

The use of social bots in Brexit has been hugely controversial. Meanwhile, according to Wogu et al. (2021), this is also considered a gross violation of British human rights. Data companies such as Cambridge Analytica have provided substantial sponsorship to Brexit campaign groups to collect private data to win votes from British citizens. This was seen as a form of cheating that not only infringed on the privacy of British citizens but also undermined the integrity of the referendum. As a result, some argue that the 2016 Brexit vote should be corrected or even called for a new referendum to make up for the damage that this deception has done to British democracy.

The use of AI as a political robot has not been stopped by People's doubts and objections. According to Howard and Kollányi (2016), the deployment of artificial intelligence in the political arena has already occurred in many countries, such as Russia, Mexico, the United States, and others. This kind of automated script is undoubtedly efficient for the dissemination of information in the political sphere. Experts say AI probably accounts for more than three-fifths of all online traffic. That's almost 20% more than it was a few years ago. The potential power of social bots to change trends allows them to manipulate sensitive topics in politics, which is certainly an effective means of controlling discourse.

7. Discussion

It follows that the use of AI can indeed affect the democratic process due to the lack of unifying principles.

The Brexit on Social Bots on Twitter suggests that they work within a cybernetic framework. According to Mira and Ana (2006), when a target is entered into the system, the feedback loop compares the input target with the output target to reduce the difference between the two. It makes multiple measurements of the target so that the output can be inferred more accurately. Social bots act as proxies in the social media ecosystem. They receive input from the algorithm, understand the target user's attitude and views on Brexit, generate feedback, and then continue to process this information back into the system. Just as the thermostat adjusts the temperature to the data it receives and then heats or cools to maintain room temperature, social bots adjust these specific statements to the “Temperature” of the public discourse. Moreover, the existence of algorithms reinforces the cybernetic feedback loop when social bots emphasizes or exaggerate the narrative in support of Brexit, the algorithm prioritizes content based on user participation, such as comments, retweets, and likes, further amplifying the pro-Brexit message. The feedback loop is reinforced.

This influence in the social media system is invisible to the average user, which is why social bots have been able to exert a hidden power over public discourse and public judgment in the Brexit vote. For citizens with democratic rights, social bots are unforgivable for undermining the democratic process. The use of AI is unstoppable on a global scale, and its impact on the field of communication is transformative. But just as social bots on Twitter are using feedback loops to shape the public discourse in support of Brexit, if AI were to become a tool for controlling the public discourse, it would defeat the purpose for which it was created.

However, AI itself is not the problem. For humans, the question of AI is not what can or can not be done, but how humans model and formalize these tools (Mira & Ana, 2006). According to Mittelstadt (2019), the AI industry has not experienced a historic moment of change, so its moral obligations are not clear, let alone translated into practice. Although there have been vague high-level principles so

far, these value statements have failed to translate into practice. Ethical issues such as those affecting the democratic process are difficult to resolve if specific knowledge can not be given in practice.

At present, key concepts such as privacy and justice in AI have been embedded in the political situation. Therefore, to reduce the further impact of AI on the democratic process, the development of AI should embed a more unified ethical framework to avoid conflicts between different norms. Moreover, the AI industry should serve different interest groups based on the search for broader unifying fundamental goals to achieve a balance between private and public interests (Mittelstadt, 2019).

In short, the impact of AI on the democratic process is irreversible, and Brexit is not the only example of automated tools influencing public discourse. In this case, the AI industry needs common ethics to avoid its use having a deeper impact on or undermining the democratic process.

8. Conclusion

In the digital age of social media, artificial intelligence has become a new tool for shaping public discourse. In the case of Brexit, AI's meddling in the democratic process is self-evident, posing a profound moral challenge to democracies. The use of social bots on major social platforms has caused controversy. Cybernetics provides a credible framework for this phenomenon. The process from algorithm input to algorithm output is based on feedback loops. The strengthened narrative represents the direction that social bots are taking and is a wake-up call for internet users. In the social media ecosystem, AI provides an efficient service for regulating and directing public opinion, but it can marginalize real issues and polarize public opinion even more. This destruction of the unified perception of reality can not be underestimated. To address the ethical dilemmas that the use of AI poses to the democratic process, it is essential to ensure that the AI industry has basic principles that are grounded in the public interest.

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