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Digital Leviathan: Digital Convenience and Digital Domination in the Information Age

-- An Analysis based on Dialectics of Nature

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ABSTRACT

Big data technology is a pivotal scientific and technological achievement of the information age. Its integration with state political power and market capital has given shape to the digital Leviathan. From the theoretical perspective of dialectics of nature, this paper argues that big data technology has driven a paradigm shift in humanity's understanding of the world, fostering acceptance of the ambiguity of data and emphasis on the correlations between data. Meanwhile, big data technology has enhanced humanity's ability to transform the world, empowering traditional government governance and market industries, and driving improvements in governance efficiency and productivity through technological innovation. However, big data technology has undergone alienation while empowering political power and market capital, forming the digital Leviathan. Through the coercive power of state authority and the developmental momentum of the market economy, it has become an instrument of domination over humanity, resulting in infringements on the rights of individual members of society.

KEYWORDS

Big Data; Dialectics of Nature; Digital Leviathan.

1. INTRODUCTION

In the second half of the 20th century, the rapid development of communication and information technology and the global proliferation of the internet gradually propelled human society from the industrial age into the information age. Since the 18th National Congress of the Communist Party of China, the Party Central Committee with Comrade Xi Jinping at its core has gained a profound insight into the trends of the new round of scientific and technological revolution and industrial transformation, firmly seized the historic opportunities of global informatization development and digital transformation, and attached great importance to, made comprehensive plans for, and advanced in a coordinated manner the development of a Cyberpower and Digital China. On the one hand, big data and information technology hold tremendous value, necessitating the understanding, application and unlocking of its potential. On the other hand, big data has brought profound changes to the entire national and social system, transforming the state-society relations, organizational forms and concepts of political power formed in the industrial age in the information age. Exploring the impact of big data technology application on social development and analyzing the underlying changes in political power structure in this context is of great significance for the development of the national big data strategy in the new era.

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Literature Review

On September 4, 2008, Nature published a special issue titled "Big Data", which put forward the concept of big data for the first time, and discussed how to study big data streams at the petabyte scale, as well as the latest strategies being developed to make the fullest use of massive data. Big data, also known as massive data, refers to information sets with such a huge volume that they cannot be captured, managed, processed and organized within a reasonable time frame through mainstream software tools to deliver more proactive decision-making support for the subject.[1] Due to its characteristics of volume, velocity, variety, low value density and veracity, big data cannot be processed with shortcuts such as random analysis, but requires the analysis and processing of all data. Big data technology is a technical system for processing and analyzing massive data, designed to rapidly extract valuable information from various types of data, covering multiple key areas including data acquisition, data storage and data processing.[2]

As the concept of the big data era has taken root and big data technology has advanced, governance issues surrounding big data have become the focus of social science research. In May 2012, the United Nations Global Pulse initiative released Big Data for Development: Challenges & Opportunities, which elaborated on the opportunities and challenges for global development in the big data era, as well as the application of big data. On one hand, big data can serve as a technical instrument to empower governance. Digital government governance integrates government governance theory with modern digital technology, holding that leveraging the utility of digital empowerment can advance the digital transformation of the government and improve government efficiency.[3] Meanwhile, the big data era facilitates exchanges and cooperation between individuals, social organizations and government agencies, driving state-society collaboration.[4] First, big data promotes the free flow of information, enhances the public's ability to select and disseminate information on public issues, and empowers citizen participation.[5] Second, it empowers social organizations, enabling the virtualization of organizational forms and the blurring of organizational boundaries, and improving the internal autonomy of organizations.[6] However, in concrete practice, the phenomenon of governance technology capture is widespread, resulting in digital empowerment at the grassroots level actually becoming a digital burden on local communities.[7]

On the other hand, big data itself has become an important object of governance. Social life has been fully digitized in the information age, and data tools led by online media have brought tremendous freedom and convenience to social life, and even play a role in maintaining the stability of social order.[8] Yet against the backdrop of the pervasive digitization of social life, the restraint of data and information power and the protection of individual information rights have become twin issues,[9] leaving individuals tiny and helpless in the face of the massive algorithmic machinery. Digital authority and digital dictatorship have become issues that must be guarded against in the big data era, and national data security and personal information and data security represent new governance requirements facing the country today.[10][11] Some scholars have paid attention to the changes in traditional political issues in the big data era. In his work Leviathan, Thomas Hobbes used the term "Leviathan", a mythical sea monster, to describe the powerful institution established by human beings through the cession of rights via social contract, in order to escape the state of war of "every man against every man" in the primitive state of nature. As a synonym for the powerful state, the Leviathan, while providing people with security, order and a sense of belonging, carries the risk of getting out of control and backlashing against humanity.[12] As a monopolistic, high-barrier technology, big data technology, when combined with political power, forms a "digital Leviathan", which may bring the risk of political centralization and become an instrument dominating society and individuals.[13]

A review of existing literature shows that while big data in the information age provides new governance technologies and improves social governance capacity, it also brings new governance

challenges. Regrettably, current research mainly focuses on big data or big data technology itself as a technical means or governance object, with relatively few studies on the integration of big data with traditional political subjects. In fact, the "digital Leviathan" formed under the current social power structure not only serves the production and life of society and individuals, but also carries the risk of infringing on the rights of society and individuals.[14] Furthermore, following the separation of the state and the market, influential financial capital formed in the economic market has emerged as a new "Leviathan",[15] which has likewise combined with big data to form the "digital Leviathan". This paper focuses on the "digital Leviathan" formed by the integration of big data with political power and market capital, and explores its important role in the information age, the underlying structural causes of its formation, and the resulting issues of digital domination.

2.2. Theoretical Framework

Dialectics of nature is an important component of Marxist philosophy. It is the science that studies the general laws of the development of nature and science and technology, the general methods for humanity to understand and transform nature, as well as the role of science and technology in social development. It is the product of the philosophical generalization and summarization of the achievements and activities of humanity in understanding and transforming nature.[16] The main contents of dialectics of nature include: first, the dialectics of nature, emphasizing that the development of nature follows the laws of its own dialectical movement; second, the dialectics of natural science, which studies the nature, characteristics, social attributes and development laws of natural science based on its history and current situation; third, the dialectics of natural science research, namely the epistemology and methodology of natural science.[17]

Among them, the methodology of science and technology refers to the universal scientific and technological theories, laws and methods in various subject areas of nature. It is a key component of the system of dialectics of nature. Just as dialectics of nature falls into the category of Marxist philosophy, the methodology of natural science and technology also belongs to the philosophical category.[18] The methodology of science and technology holds that, first and foremost, labor is the fundamental premise for humanity's rational understanding of nature, science and technology. In the process of labor, human beings make and use tools, thereby understanding nature and science, and transforming natural science into technology to be applied in the practice of transforming the world.[19] Second, from the perspective of human beings as the subject, humanity's understanding of nature and science and technology is purposeful and dynamic, and all human cognition and transformation of the objective world stem from human needs themselves.[19] Finally, in line with the law of human self-development, the continuous development of cognitive ability is the objective guarantee for humanity's in-depth research on science and technology. The mission of human thinking is to continuously understand the objective world, creating an inexhaustible source of intellectual power for humanity to transform the world.[19]

As the most representative scientific and technological achievement of the information age, big data and big data technology are themselves products of human labor, providing new technical means for humanity to understand and transform nature, and exerting a profound impact on human society.[20] Analyzing big data and big data technology from the perspective of the scientific and technological methodology of dialectics of nature can help us gain a deeper understanding of the important role of the digital Leviathan in the information age, as well as a more accurate grasp of the potential problems of digital domination.

3. SOCIAL TRANSFORMATION UNDER THE INFLUENCE OF THE DIGITAL LEVIATHAN

Dialectics of nature not only regards science as an independent social phenomenon and explores the laws of its development and function in a given society, but also studies technology closely related to science as an independent social phenomenon. The development of big data technology in the current information age is built on the advancement of other foundational technologies, and is a product of humanity's need to understand and transform nature, developing within society and exerting a significant impact on it.

3.1. The Impact of the Digital Leviathan on Humanity's Understanding of the Natural World

Humanity's ability to understand the natural world is closely linked to the level of scientific and technological development of the times. Advanced science and technology help human beings understand the world more accurately, while also shaping humanity's perception of the world. Big data is a product of the development of the information age, and its emergence has driven humanity to advance science and technology to further understand the world. Big data technology, which makes full use of information systems and the data processing capabilities of computers, is regarded as the fourth way for humanity to understand the world, and has promoted a fundamental transformation in humanity's mindset and concepts for understanding the world.

With the continuous development of the information age, humanity is faced with larger and more complex data bodies in the process of understanding the natural and social worlds, and is also equipped with more powerful data processing and analysis capabilities. First, in the information age, human beings have access to a far greater volume of data, which reflects the volume characteristic of big data. Big data technology has enhanced humanity's ability to collect information, enabling the digitization of all activities in human social life and the natural world, with the technical capacity to record and store massive amounts of data.[21] Enabled by big data technology, humanity's understanding of the world no longer relies on simple data obtained through random sampling, but is based on the analysis of all relevant data on a given phenomenon. Second, with the ability to acquire and use all available data, the increase in data volume brings about data complexity and inaccuracy, which corresponds to the variety and veracity characteristics of big data. This has brought a new method for humanity to understand the world: with the shift from small data to big data, human beings can have a higher tolerance for the imprecision of data. When in possession of massive amounts of information and data, the accuracy of a single data point has an insignificant impact on the correct understanding of the whole, and human beings can accurately understand the object and judge its development trend through the analysis of the overall data. Finally, the development of big data technology has enhanced humanity's ability to process vast amounts of data. In the big data era, "in the face of massive information, each person only needs the information that is beneficial and useful to them", which reflects the low value density characteristic of big data. However, with the powerful data processing capacity of computers, big data technology can extract value from the complex and diverse data phenomena, embodying the velocity characteristic of big data. This is beyond the reach of traditional information and data technologies. Human beings are no longer helpless in the face of massive data; instead, they have the ability to conduct in-depth analysis of these data and discover the inherent connections between them amid enormous complexity.

Under the influence of big data and the development of big data technology, humanity's mindset and concepts for understanding the world have undergone a tremendous transformation. As analyzed above, given the volume and variety characteristics of big data, when understanding the world constituted by data, human beings should no longer be obsessed with pursuing the precision of data, nor is it possible to achieve the precision of all data. Based on the ambiguous understanding of data, it is impossible to accurately obtain the causal relationship of events in human society and the natural

world. Similarly, under the logic of the big data era, there is no need to explore the reasons behind phenomena; knowing "what is" is sufficient, and there is no need to know "why". In the process of understanding the world, human beings need to shift from the original concept of unilaterally exploring and understanding the world, and instead learn to let the data "speak for itself", focusing on the correlations between data behind events rather than blindly considering the causal relationships between events. By identifying a good correlate of a phenomenon, correlation can help human beings understand the current world and grasp the future.[22] That is, if A and B often occur together, we only need to notice that B has occurred to predict that A will also occur. For example, through the analysis of product sales data, Walmart found that before seasonal hurricanes hit, sales not only of flashlights increased, but also of a specific type of egg tarts. Therefore, when seasonal storms approach, Walmart places its stock of egg tarts close to hurricane supplies to accommodate hurried customers and boost sales.[23] Certainly, the impact of big data technology on the transformation of humanity's mindset for understanding the world is not about replacing causality with correlation, but about complementing causality and correcting "false" causal relationships. Enabled by big data technology, proving correlation requires less experimental cost and time compared to proving causality. Daniel Kahneman, the Nobel laureate in Economics, points out that human beings have two modes of thinking. The first is effortless and fast thinking, through which results can be obtained in seconds; the second is more effortful and slow thinking, which requires thorough consideration of specific problems.[24] In daily life, affected by thinking inertia, fast thinking tends to dominate, so human beings may conjure up certain causal relationships in the process of understanding the world, leading to a wrong understanding of the world. By analyzing the correlations between data, big data technology can correct the errors in some causal relationships formed under original intuition.

3.2. The Transformation of Social Productivity Driven by the Digital Leviathan

Dialectics of nature holds that technological innovation is the key to the development of social productivity, as well as a critical factor in productivity and social transformation. Innovation in science and technology can drive the transformation of production modes and the progress of social development. In the big data era, on one hand, big data itself as an emerging industry has unique development value. On the other hand, big data technology can empower traditional government governance and market industries, realizing improvements in governance efficiency and production efficiency through technological innovation.

"The dignity of movement of an iceberg is due to only one-eighth of it being above water." This is the "iceberg principle" put forward by Ernest Hemingway. Using the iceberg as a metaphor, he argued that in literary creation, the author should only describe the part of the iceberg above water, while the part underwater should be supplemented and imagined by the reader through the hints in the text. Big data in the current information age shares the same characteristic: what is revealed is only the surface, while its truly enormous value is often hidden beneath. The transformation of modern social productivity is developed on the basis of this cognition, taking into account not only the current role of data, but also the value generated by its various potential future applications. The grasp of the potential value of data has greatly improved the industrial productivity of the big data industry and its role in social development. The value of this dormant data can only be unlocked by combining it with other completely different data sets, and mixing these data in new ways can lead to groundbreaking discoveries.[25] Designing for scalability at the start of data collection is an important way to promote the reuse of the potential value of data. However, this is often difficult to achieve in social practice, because human beings always realize this long after the data has been collected. At the same time, the value of some used data for their primary purpose may diminish, but their potential value remains strong.[26] This "data exhaust" is a by-product of users' online interactions, such as which pages they browse, how long they stay, where the mouse cursor hovers, what information they enter, and so on, which may play an even greater role with the development of subsequent analytical technologies. This has given rise to a large number of emerging industries

related to big data. The first is value generation based on data itself, that is, entities that own a large amount of data or at least can collect massive data, but do not necessarily have the skills to extract value from the data or use it to generate innovative ideas, existing as data providers. The second is value generation based on technical skills, such as providing consulting, technology supply or analytical services, which does not require ownership of data, with technicians acting like machine operators in the industrial age. The third is value generation based on innovative thinking, which does not require mastery of analytical technology or even the data itself, but creates value through unique ideas on how to tap new value from data, with the actors serving as inventors in the information age.[27]

Among data providers, the government is the largest original collector of large-scale information, while competing or cooperating with market enterprises on the massive data under their control. The technical value of big data for the public sector is the same as that for market enterprises, and most of the value of data is latent and needs to be released through innovative analysis. Both the public sector and market enterprises can realize the value of big data through big data technology, further empowering governance and production. From the perspective of government governance, on one hand, big data technology can improve the internal operational efficiency of the government. The government management process and management methods have undergone tremendous changes driven by both the advancement of big data technology and government reform practices.[28] With the support of big data technology, the recording and analysis of data traces in the government's internal decision-making process can improve the government's decision-making procedures, optimize decision-making objectives, enhance the quality of government decisions, clarify the effects of policy implementation, and facilitate the evaluation of government administration. On the other hand, big data can improve the government's external governance efficiency.[4] Big data technology brings transformative opportunities for the government's digital transformation, empowering the government with new governance capabilities centered on data-driven governance, technology embedding and social collaboration. In the big data era, the scope of government governance has further expanded into the digital space, requiring the full integration of online digital governance and offline physical governance. Using big data technology, the government can analyze public affairs and policy processes across a wider scope, longer time frame and finer granularity, grasp diverse demands more accurately, timely and in-depth, predict and judge social development trends and potential social risks, and enhance its decision-making, supervision and service capabilities. From the perspective of enterprise production, big data technology can promote the improvement of the level of new quality productive forces in regions, with significant differences influenced by geographical location, industrial structure endowment, scientific and technological level, and financial development environment of different regions.[29]

4. DIGITAL DOMINATION FORMED BY THE DIGITAL LEVIATHAN

Dialectics of nature puts forward the theory of alienation of labor and technology, holding that with the development of social division of labor and production modes, human labor and technology are continuously alienated, losing their original autonomy and creativity and becoming the opposite of laborers. On one hand, the development of productivity divides labor into different processes and sectors, making workers' labor tedious, repetitive and monotonous, and stripping it of creativity and autonomy. Workers are deprived of control over working conditions and working hours, with labor becoming increasingly onerous and oppressive. On the other hand, the development of technology has been alienated, with technology becoming an accessory controlled by capitalists and a tool to deprive workers of their creativity. When technological progress is not aimed at liberating human productivity and improving humanity's ability to understand and transform the world, but at controlling and exploiting human beings, the alienated big data technology, combined with state political power or market capital, becomes the digital Leviathan, deepening the contradictions and antagonism between individual members of society and state political power or market capital.

4.1. Digital Domination by Political Power

In traditional agrarian or industrial societies, "domination" refers to the concentration of the management of material means in the hands of the dominator.[30] In the information society, the alienation of big data technology is mainly manifested as digital domination. While transforming humanity's mindset for understanding and transforming society and improving social productivity, big data technology has become a tool of domination for those with concentrated political power, evolving and integrating into the "digital Leviathan", which concentrates the management of digital resources and technical means in addition to material means.[14] With the rapid development and gradual application of new technologies in national governance practices in the digital society, big data technology has delivered digital intelligence, empowerment and efficiency enhancement to state political power and authority institutions, leading to a rapid improvement in the state's capacity for management and governance. Enabled by big data technology, the government has innovated its policy tools, gained more scientific organizational decision-making capabilities, and can take more agile actions to provide high-quality public services, advancing the evolution of the organizational form of the public sector. Examples include the development of digital government,[31] face recognition and inspection technology in public security systems, and the dynamic monitoring technology to prevent poverty relapse in the battle against poverty.[32]

The other side of the coin is that the rapidly enhanced state control has transformed the original form of domination of the public by state political power, evolving into digital domination by political power. It is mainly manifested in the use of big data technologies such as data and computing power resources, on the basis of mastering massive data, to carry out national governance, public service supply and political order construction through coercive, inductive and manipulative means of domination. The public power attribute of state political institutions endows digital domination with "legitimacy" to collect data and apply big data technology in the public and even private spheres. As discussed above, the national government is the largest original collector of data, and the social governance system captures and records all the activity information of the public for storage, analysis and processing while providing a full range of services to the public. Compared with traditional political power, the power execution mode of the digital Leviathan is more concealed. On one hand, the digital Leviathan leverages the ubiquitous nature of digital technology and social individuals' dependence on it, making the inherent coerciveness of power domination less perceptible. On the other hand, algorithmic black boxes and complex code programs are hidden behind the overt power domination, making it difficult for individuals to detect the acquisition, storage and use of their information by power subjects, let alone know when and for what purpose the power holders will impose access restrictions on the data applications they use. At the same time, the rapid advancement of big data technology empowers state political institutions, realizing the efficient operation and rapid expansion of public power. On one hand, the subjective will of the holder of state political power can directly implement instructions through the digital programs of big data technology, reducing the constraints of human beings as intermediaries in power execution, and accurately locking in the dominated object and exerting influence anytime and anywhere through digital technology.[33] On the other hand, in the information age, information about society, individual members of society and the natural world can be fully digitized and permanently preserved with the development of storage technology, expanding the scope of domination of state political power.

Meanwhile, with state political power empowered by big data technology, the digital Leviathan can generate data discrimination, bringing huge risks and harm to marginalized social groups. On one hand, it amplifies society's inherent exclusion of marginalized groups. Big data is a mirror of society, and big data algorithms obtain data features through training on historical data, and all these features together constitute the feature space of the data.[34] Therefore, the structural racism and negative prejudices against certain ethnic minorities existing in the whole society will be reflected in the data, and these biases will be truthfully summarized by big data technology and affect specific social practices. On the other hand, it makes correlation-based predictions about events that have not yet

occurred. Big data technology can infer currently unknown information from past data, and in the operation of state political power, the correlation between big data blurs the line between poverty and crime. State power institutions predict the possible actions of certain groups in the future based on historical behaviors and their social networks shown in big data, with predictive variables derived only from very limited data. The application of high-tech big data has instead left vulnerable groups facing stricter digital tracking, surveillance and even punishment, firmly trapped in a network of data sentinels, algorithmic analysis and supervision, and unfair information feedback loops.[35] Therefore, when the digital Leviathan operates under conditions of insufficient data volume, weak data representativeness, the presence of data noise and junk data, data overfitting and underfitting, and the lack of a dynamic algorithm monitoring mechanism, big data technology will deepen the inherent biases in society, and these biases will become even more large-scale and even "legitimate" driven by state political power.

4.2. Digital Domination by Market Capital

In the information age, big data presents an "iceberg effect", with all data holding enormous untapped value. With the development of big data technology, big data itself as a data resource has unique value, and the integration of big data technology with market capital has improved the efficiency of the industrial market. In current social practice, academic discussions on digital domination mainly focus on the digital infringement of the public by market entities in the data collection link.[36] Driven by the profit-seeking principle, various types of privacy of the public, such as mobile phone numbers, address books, call records, text messages, online shopping records, travel records, map navigation, food delivery, financial lending, online social interactions and internet browsing preferences, are all regarded as a "cash cow" by market entities. Through big data technology analysis, these seemingly useless data "waste" can be used as the basis for user profiling, enabling market entities to achieve precise digital marketing. To occupy the high ground in the digital landscape, market capital is keen on collecting data resources, collecting personal information beyond the authorized scope and in a mandatory manner. Meanwhile, some lawbreakers illegally collect personal information and eavesdrop on personal conversations to resell them for high profits. Mobile devices such as smartphones have increasingly become an indispensable product in modern human life. Some mobile app development and operation companies have various partnerships with advertisers. After obtaining user permissions such as voice, call and location permissions, platforms and merchants may record users' audio, upload the relevant recording files to the server, and even transfer some user information to relevant advertisers without the user's consent, so as to improve the accuracy of advertising placement.

Beyond data collection, technologies such as big data analytics empower market capital and enhance its ability to dominate society and individual members of society. After obtaining a large amount of raw data through technical collection methods, market enterprises can use big data technology to classify, profile, automatically analyze and systematically evaluate the economic status, health and credit level, and behavioral habits of the individuals from whom the data is sourced, accurately grasp user preferences and information sensitivity, and store and sell these data to market capital. Correlation has become cheap and convenient with the application of big data technology. The use of big data algorithm recommendation technology has enabled the communication technology in social production to rapidly shift from the "people searching for information" model to the "information finding people" model. While solving the high-cost problem of "people-information" matching, it has realized the personalization, customization and intelligence of information push. Therefore, behind the increasingly accurate information delivery by various online platforms and market merchants based on their growing understanding of the needs of society and individuals, lies the actual digital domination of society and individuals by market capital, which dominates user behavior by capturing their attention.[37] For example, under the same time and location conditions, there are huge differences in order prices when using different models of mobile phones to hail ride-

hailing services, with even larger price gaps in high-value consumption such as travel and hotel bookings. Or on various online shopping platforms, there are cases where the higher the membership level, the more expensive the goods. These are all concrete manifestations of "big data price discrimination against regular customers" under the digital domination of market capital.

The national government is the largest original data collector in the information age, holding the most massive big data, while market capital continuously updates and develops big data technology driven by interests. The digital Leviathan under political power and the digital Leviathan under market capital are not mutually antagonistic; instead, they cooperate in specific events to form a more powerful force of digital domination and digital hegemony, even with the ability to influence the domestic and international political landscape of a country. According to reports by The New York Times and The Observer of the UK, Cambridge Analytica, a British political consulting firm, purchased data on 87 million users from Aleksandr Kogan, a professor at the University of Cambridge, which included information on users' personality traits, value orientations, life experiences and behavioral patterns. In the 2016 US presidential election, the company used psychological profiling technology to manipulate the emotional responses of a large number of voters by precisely placing political advertisements to target audiences, ultimately helping Donald Trump win the votes in key swing states and become the 45th President of the United States. In the information age, both national governments holding political power and market enterprises with financial capital have evolved into the "digital Leviathan" through the empowerment of big data technology, enhancing their ability to dominate society and individuals, so as to ensure the stable grip of state power and the acquisition of higher economic benefits.

5. CONCLUSION AND DISCUSSION

Big data technology is the most representative and important scientific and technological achievement of the information age. Dialectics of nature emphasizes the role of science and technology in promoting productivity, holding that science and technology are a vital force for the development of productivity, and the driving force for the transformation of production modes and social progress. Big data is characterized by volume, velocity, variety, veracity and low value density. Through the collection and analysis of massive data, big data technology can transform humanity's mindset in understanding the world, fostering acceptance of the ambiguity of data and emphasis on the correlations between data, thereby enabling a more objective and accurate understanding of nature and human society. As an important commercial and political resource, big data is an emerging industry under the development of the information age. Big data technology empowers government organizations and market industries, realizing improvements in governance efficiency and production efficiency through technological innovation, and exerting a significant impact on all aspects of the world, including agriculture, industry, healthcare, social sciences and humanities.

The digital Leviathan has the dual attributes of emancipation and oppression. Big data technology not only empowers society and individuals, enhancing their ability to participate in politics and express demands, but also empowers political power and market capital, evolving to form digital domination. Compared with the state and large market capital as the owners of big data and the masters of big data technology, individual members of society appear tiny and insignificant. Therefore, in concrete social practice, the digital Leviathan mostly exists as an alienated instrument of domination. In national governance, it is highlighted by the dilemma that human security, order and freedom in the digital age are highly dependent on the sovereign digital state, yet human beings are powerless against the potential algorithmic bias and domination of the sovereign digital state. In market enterprises, the digital Leviathan is manifested in the fact that while human beings gain access to convenience in production and life, digital access opportunities and participation in digital activities, they have no choice but to unconditionally accept the service terms provided by commercial institutions, and are helpless against the abuse of their personal data, algorithmic black boxes and other forms of digital

domination. Therefore, human beings need to adopt a scientific approach to understand big data and use big data technology through dialectics of nature, so as to better utilize newly developed technologies to serve social development.

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