The Nexus of Logistics and Social Control: Mass Surveillance in the Digital Era

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Abstract

Modern logistical technologies—such as the Internet of Things (IoT), delivery drones, and blockchain—are increasingly employed as tools for mass surveillance, raising significant concerns about individual privacy. The traceability of logistical flows facilitates not only the tracking of products but also extends to individuals, generating data that is frequently repurposed to control or influence behavior. In smart cities, for example, citizens' movements and consumption habits are monitored in real-time, further undermining the notion of anonymity. This trend reflects a model of "consensual surveillance," where individuals willingly exchange personal data for perceived benefits, such as convenience or customized services, often without fully grasping the extent of its commercial exploitation. Mass surveillance raises pressing ethical issues, including risks of algorithmic bias, discrimination, and increased social control by governments or corporations. While regulatory frameworks aim to protect individual rights, they frequently struggle to keep pace with the innovation in logistical technologies. Addressing the societal challenges posed by mass surveillance requires a delicate balance between fostering technological progress and preserving fundamental liberties. Achieving this balance calls for the integration of ethical principles and the development of transparent supply chain solutions that prioritize privacy protection.

Keywords: blockchain, drones, ethics, Internet of Things (IoT), logistics, mass surveillance, privacy, social control, supply chain, tracking

1. Introduction

Traditionally focused on managing product flows, logistics has evolved into a field deeply intertwined with sophisticated mass surveillance technologies. The increasing adoption of advanced tools such as blockchain, the Internet of Things (IoT), delivery drones, and geolocation systems is profoundly transforming how societies oversee exchanges, movements, and even individual behaviors. In an era of "intelligent" supply chains, the distinction between logistics management and mass surveillance strategies has grown strikingly blurred, raising critical questions about whether tools originally designed to optimize product flows have, perhaps unintentionally, become powerful instruments of social control. These logistical innovations, which gained significant momentum during the Covid-19 pandemic (Sułkowski *et al.*, 2022), are ostensibly aimed at improving efficiency and speed in delivery processes. Yet, they simultaneously enable unprecedented levels of mass surveillance over human activities, often without the knowledge of those being monitored. Furthermore, the ethical ramifications of these developments demand urgent scrutiny, as they deeply affect privacy, autonomy, and trust within modern society.

Examining the implications of the evolving nexus between logistics and social control raises a crucial question: *to what extent can logistical technologies and innovations be leveraged to scrutinize individual behavior, monitor populations, and reinforce systems of power, whether governmental or private?* For instance, the accumulation of data through product traceability, real-time tracking of individuals via geolocation, and the ability to intervene instantly in physical flows using delivery drones have emerged as powerful tools for imposing increasingly intrusive oversight over citizens (Prince *et al.*, 2021). Moreover, the capacity to analyze this collected data enables the creation of detailed profiles, which can be used to predict and even influence behavior. The ethical issues rise further when such tools are applied without transparency or clear accountability mechanisms. While digital tools undeniably offer

significant benefits in terms of security and efficiency, their use also prompts critical ethical concerns surrounding privacy, individual liberties, and the potential for manipulation.

This article adopts a critical studies perspective, examining how advanced logistical technologies are increasingly being repurposed as instruments of mass surveillance and social control. The primary aim is to analyze the efficiency of informational and physical tools such as blockchain (for comprehensive flow traceability) and delivery drones (for ultra-fast deliveries), emphasizing their pivotal roles in managing the flow of products and people. Additionally, we aim to explore how these tools intersect with mass surveillance policies and their potential applications in regulating populations on a large scale. Our analysis seeks to shed light on the social and ethical consequences of misusing logistical innovations by evaluating their broader impact on the relationships between key stakeholders and societal structures. Following Crespo de Carvalho *et al.* (2014), the goal is to introduce fresh perspectives and innovative concepts into the logistics field, enriching its body of knowledge while addressing the complex challenges posed by emerging technologies.

2. Logistics for Mass Surveillance

Advanced technologies such as blockchain, delivery drones, and real-time traceability systems are significantly transforming supply chains while simultaneously raising concerns about their potential role in social control (for an in-depth discussion on social control concept, see Horwitz [1990]). Companies increasingly leverage these innovations to enhance the efficiency of logistical processes, customize services, and reduce operational costs. However, the vast accumulation of data at every stage of a product's lifecycle or interaction with consumers creates new avenues for heightened mass surveillance of individual behavior. By cross-referencing collected data, advanced algorithms can construct detailed profiles, which may sometimes be utilized to track or infer social and political practices. While these technologies undeniably offer substantial benefits in optimizing product flows, they also provoke critical ethical questions about privacy and individual liberties. Striking a balance between technological advancement and the protection of fundamental human rights is, therefore, an imperative that warrants serious reflection.

2.1 Data

The digital era has facilitated the digitization of nearly every stage of modern supply chains (Seyedghorban *et al.*, 2020). From production to consumption, products in our daily lives are now monitored through sensors, RFID chips, and real-time tracking technologies. Online and offline retailers utilize this data to optimize inventory management, streamline delivery routes, and enhance returns processing. The resulting improvements in responsiveness to demand not only reduce operational costs but also significantly enhance the customer experience. These technologies allow for more customized management of supply chain networks and swift adaptation to market fluctuations, enabling offerings that align closely with consumer expectations and foster increased loyalty (Garrouch *et al.*, 2011). However, the pervasive collection of data at every point of an individual's interaction with a product reveals a dual function: economically, to improve service efficiency, and insidiously, to monitor behaviors—for example, gauging positive or neutral responses to promotional offers.

Data gathered from online purchases, shopping preferences, delivery histories, and even interactions on social networks enable highly detailed consumer profiles to be constructed. This data feeds advanced algorithms capable of predicting future behavior and customizing marketing offers with remarkable precision (Boone *et al.*, 2019). When accumulated and centralized, such information can serve as a powerful tool for governments or corporations in implementing sophisticated social control programs. Indeed, cross-referencing data can reveal an individual's habits, movements, preferences, and even opinions. For instance, by combining purchasing data with geographical and temporal information, it becomes possible to map an individual's daily activities with striking accuracy, providing insights into their personal life and behaviors. Thus, data collection transcends logistical dimensions, evolving into a mechanism of influence and control, raising significant ethical questions in societies increasingly defined by mass surveillance and the erosion of privacy.

2.2 Blockchain

Among the technologies raising significant concerns about social control, blockchain stands out as particularly problematic. Originally developed for the decentralized management of monetary transactions, blockchain has increasingly been integrated into logistical systems. By ensuring the transparency and immutability of data, it allows products to be meticulously tracked throughout the supply chain. In a globalized and digitized world, this provides companies with an unparalleled ability to trace flows with precision (Xu *et al.*, 2019). Products can now be monitored from their origin to their destination, passing through every stage of their journey. Blockchain also helps

reduce the risk of fraud and counterfeiting by verifying product authenticity at every checkpoint. These capabilities lead to optimized logistical processes and foster greater inter-organizational trust. However, the heightened transparency that blockchain enables also poses significant risks, as it facilitates the collection of sensitive personal data, potentially opening the door to abuses in tracking individual behaviors.

Indeed, while blockchain can guarantee the provenance and journey of a product, it also has the capacity to track the movements of individuals who interact with that product, especially when they purchase it online and have it delivered to their homes. Every transaction, every exchange, and every movement are recorded and transparently accessible, resulting in the collection of personal data on an unprecedented scale. Given that blockchain can be used by governments or corporations to centralize and cross-reference data, as previously discussed, it becomes a potentially oppressive surveillance tool. A government, for example, could identify "suspicious" behavior based on product movements or frequent visits to certain types of shops or online services (see Vignette 1). By consolidating data on purchases, consumption habits, and places visited, it becomes easy to construct detailed profiles of individuals, paving the way for intrusive and potentially harmful mass surveillance practices that can infringe on privacy and individual liberties.

Vignette 1. Blockchain: a danger to privacy

In the hands of an authoritarian government, the technology behind blockchain allows for the surveillance of a citizen's every action. By cross-referencing information stored in multiple state-run registries, blockchain transforms into a versatile and omnipresent mass surveillance tool, warns Frank Braun, a prominent figure in crypto anarchism, in an interview with Medium.com: "If you combine an identification blockchain with a payment blockchain, a car ownership blockchain, a vaccination tracking blockchain, an online shopping blockchain, etc., you end up in a situation where every individual and all their actions are permanently and publicly recorded. Humans are ultimately tagged and monitored like livestock."

Source: Adapted from https://cryptoast.fr/blockchain-danger-liberte-vie-privee/ (Accessed September 10, 2024).

2.3 Drones

Originally developed to handle ultra-fast e-commerce deliveries, drones are increasingly being adopted due to their effectiveness in accessing hard-to-reach areas (Benarbia & Kyamakya, 2021). Their ability to navigate diverse terrains, whether urban or rural, makes them a preferred tool for various logistical applications. While drones are commonly used to transport small packages, they are also capable of undertaking more complex tasks that other modes of transport struggle to accomplish, such as delivering to remote locations or handling fragile items. Their use could broaden the possibilities for product flow and inventory management, reducing operational costs while enhancing flexibility and speed in regions where transportation infrastructure is limited or nonexistent. Moreover, delivery drones could help reduce the environmental impact of traditional transport systems by lowering carbon emissions and easing congestion in urban areas, particularly for very small package deliveries (Rodrigues *et al.*, 2022). The potential for widespread use in cities, delivery networks, and even emergency response scenarios, presents new opportunities for innovation. While this technology offers clear advantages in logistics, it also raises new possibilities for organizing urban spaces and territories, presenting significant challenges in integrating it into existing environments and regulatory frameworks.

Thanks to their real-time data-gathering capabilities, drones can record video, capture thermal images, and detect sound, offering a detailed view of the environments they fly over. This explains their success over the past decade, according to Abro *et al.* (2022). Some drones are even programmed to follow predefined routes or detect anomalies in observed behavior (Clarke, 2014). These devices can also analyze human movement patterns and identify sensitive or high-traffic areas. When used in mass surveillance systems, drones become highly effective management tools, collecting detailed data on people's movements and activities. Cross-referenced with other data, such as information from smartphones (Timan & Albrechtslund, 2018), drones provide an in-depth understanding of habits and movements, which can be easily analyzed through big data analytics and predictive algorithms. Additionally, their ability to integrate with other technologies, such as facial recognition, further enhances their social control capabilities. While drones offer significant benefits in managing logistical operations, their use raises serious ethical concerns regarding privacy, personal data protection, and the potential for mass surveillance (see Figure 1), particularly when deployed without appropriate oversight.

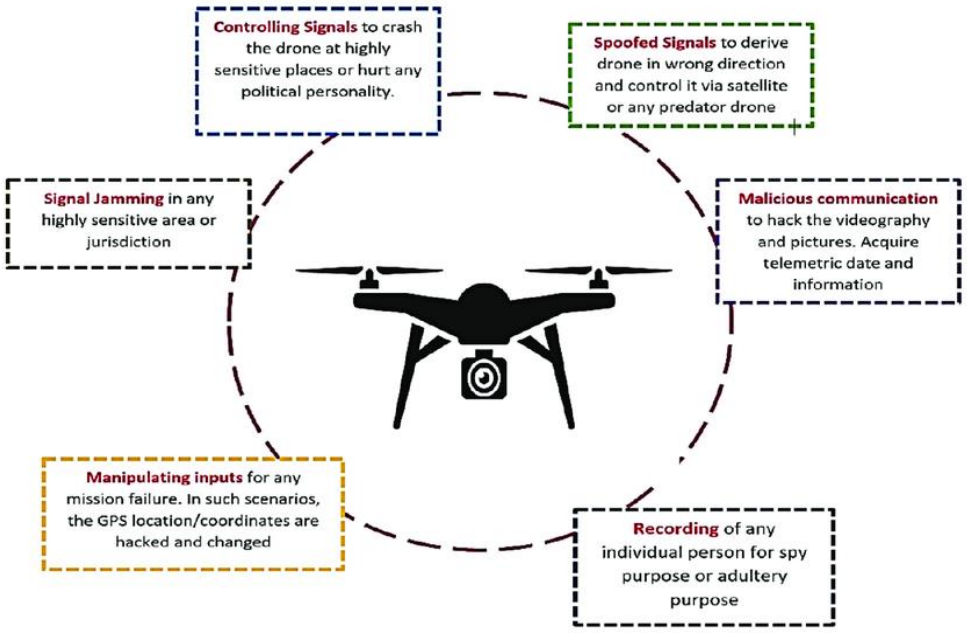

Figure 1. Security and privacy threats of drones

Source: Abro *et al.* (2022).

3. What Threat to Individual Liberties?

The convergence of advanced logistical technologies and mass surveillance is raising increasing concerns about the creation of pervasive social control. As traceability systems and big data analytics are deployed, their potential to monitor and influence individual behavior extends far beyond the optimization of product flows. While logistics is traditionally intended to enhance the efficiency of production and physical distribution operations, it is also emerging as a powerful tool for social control and behavior modification. This development has significant implications, not only in terms of privacy but also with respect to social justice, equity, and the fairness of economic systems. From this perspective, it is crucial to examine how advanced logistical technologies reinforce and expand existing social control mechanisms, potentially leading to greater inequality and control over individuals' everyday lives and limiting individual liberties.

3.1 Social Control

One of the primary concerns raised using advanced logistical technologies in mass surveillance is their potential to reinforce social control mechanisms without individuals being fully aware. A well-known example is China, where the government has implemented a social credit system that relies heavily on data collected by logistical technologies and digital platforms (Liu, 2019). This system evaluates citizens' "reliability" through a broad range of criteria, including their purchasing behavior, punctuality in online payments, and the nature of their social interactions. In this way, every aspect of an individual's daily life—such as their movements, purchases, and even personal preferences—can be monitored, analyzed, and used to assign a reliability score. The episode of *Black Mirror* produced by Netflix and titled "Nosedive," broadcast in October 2016, offers a somewhat "romanticized" yet realistic depiction of this dystopian world where a panopticon-like surveillance system prevails (Serdar, 2023).

The model relies on integrating data from multiple sources, including logistical transactions such as online shopping deliveries and movements in public spaces via transport cards, creating an extreme form of state mass surveillance. The ability to collect and cross-reference data enables governments to subtly yet powerfully influence individual behavior, whether in terms of access to credit, the uptake of certain public services, or even employment opportunities. The system transforms citizens into "surveillance subjects," with every action potentially evaluated and judged based on politically defined values (see Vignette 2). In this context, logistical data management becomes a tool for social control, challenging the very notion of individual liberties. While this approach may be effective in promoting "good behavior" (Xu *et al.*, 2022), it raises critical questions about the balance between security and freedom, as well as the risks of manipulating behavior on an unprecedented scale.

Vignette 2. China gives Europe ideas

China's social credit system for rating citizens is inspiring similar ideas in Europe. In Italy, several cities are experimenting with a local point system to reward "virtuous citizens." In March 2023, the mayor of Bologna announced the introduction of a Smart Citizen Wallet, designed to award points for good deeds. The concept is like the points-based loyalty systems used in supermarkets. "The citizen earns rewards for actions such as sorting waste, using public transport, managing energy efficiently, or utilizing the culture card," explained the municipality. Each action earns a certain number of points, which can be redeemed for rewards," Bologna's mayor told Corriere di Bologna. *This point-based system is often compared to China's social credit system, although the Italian experiment does not include penalties. "We want people to understand that they are not losers and that their positive behavior will be rewarded," concluded Bologna's mayor at the presentation of the new system, which has also been introduced in Rome.*

Source: Adapted from *La Dépêche*, May 22, 2023.

3.2 Monitoring Economic and Social Flows

In addition to their impact on monitoring individual behavior, logistical technologies also play a key role in tracking economic and social flows. Companies now use data gathered on purchasing behavior not only to optimize production and physical distribution but also to manipulate consumer preferences, boost sales, and reinforce business models centered around over-consumption (Brintrup *et al.,* 2024). Data collection and analysis have become powerful levers for shaping market dynamics, influencing purchasing decisions, and even restructuring entire markets. By analyzing daily journeys to stores or regular online consumption patterns, mass surveillance systems offer a comprehensive view of social and economic behavior, which, in theory, enables more efficient resource management but also paves the way for stricter control over people's movements, interactions, and decisions. As these technologies continue to evolve, their integration into various aspects of daily life raises significant ethical concerns regarding privacy, autonomy, and the potential for exploitation.

As is easy to imagine, logistics contributes to a form of invisible social segregation. Delivery services, public transport management, and even certain products can become accessible or inaccessible depending on socio-economic factors, creating a new form of exclusion. The "privileged" enjoy easier, optimized access to resources, including logistics, while others are confined to less efficient, more expensive, or simply non-existent distribution channels. Isolated or disadvantaged territories, often ignored by technological innovations (Contigiani & Testoni, 2023), are particularly affected by these disparities. In this way, logistical technologies, while increasing economic efficiency, are helping to create a dual society in which social inequalities are exacerbated by the selectivity of product and service flows. This dynamic reinforces existing inequalities and paves the way for new forms of social control based on access to economic resources, accentuating the divide between different social strata, potentially limiting opportunities for upward mobility.

4. Logistics and the Erosion of Privacy

The convergence of logistical technologies and mass surveillance tools is driving profound societal transformations. The widespread use of data raises significant concerns about privacy, even challenging the very notion of anonymity in both public and private spaces. While logistical traceability systems enable real-time tracking of products and individuals, they also convert personal data into powerful levers of control over citizens. Whether they are aware of it or not, individuals are increasingly becoming participants in compliance with mass surveillance, without overt pressure, to use the terminology of Freedman & Frazer (1966) in social psychology. These emerging forms of social control present complex ethical dilemmas that logisticians, supply chain managers, and policymakers must address, balancing operational efficiency with individual liberties. It is critical to consider the broader implications for social justice, equity, and personal autonomy, ensuring that technological advancements do not come at the expense of fundamental human rights.

4.1 The End of Anonymity

As mentioned earlier, one of the major challenges posed by advanced logistical technologies and the resulting mass surveillance is the exploitation of individuals' personal data. Advances in this field, driven by the IoT and digital inventory management, not only enable real-time tracking of products but also facilitate the continuous analysis of personal information about recipients (Brau & DeCampos, 2024). Every interaction between a consumer and a

product—whether it is an online purchase or the receipt of a parcel—generates a substantial amount of data, raising concerns about transactional anonymity. In the past, product flows were managed in a relatively opaque manner: a product would arrive at its destination in a store or a pick-up point, and the consumer was not necessarily rigorously identified. With today's blockchain-based traceability systems, every purchase and interaction with a product is recorded, analyzed, and exploited for purposes beyond the original intent of data collection.

The rise of smart cities and the increasing integration of logistics into urban infrastructure management are intensifying this phenomenon. In these smart cities, with Singapore serving as one of the most representative examples (see Vignette 3), all individual mobility is interconnected and monitored in real time, to the point where Melgaço & van Brakel (2021) describe smart cities as a "surveillance theater." Citizens' personal data—including their movements, purchases, and habits—are collected through various devices, from sensors embedded in urban infrastructure to mobile applications used daily. This data, enhanced by artificial intelligence tools and advanced machine learning algorithms, is making the concept of anonymity increasingly ambiguous. Whether they are aware of it or not, citizens are becoming participants in an extensive data processing system, where their behavior is modeled, anticipated, and sometimes influenced, ultimately shaping more complex and interconnected urban environments.

Vignette 3. An example of a dynamic smart city

Singapore may cover just 276 square kilometers, but it is home to over 5 million people. In its drive to solidify its reputation as a smart city, Singapore has committed to developing autonomous vehicles by 2021, aiming to reduce commute times to 45 minutes. Already, students at the National University of Singapore travel to campus in self-driving shuttles, while the elderly and disabled benefit from an autonomous fleet of driverless shuttles to navigate medical complexes. The city's smart infrastructure extends beyond mobility, with short-term plans to implement a network of drones capable of delivering parcels and letters, as well as conducting building inspections. In May 2020, Singapore conducted a trial in collaboration with shipping giant Eastern Pacific Shipping. The trial successfully transported 2 kg parcel 2.7 kilometers from Marina South Pier to offshore waters in just seven minutes—while a boat would have taken over two hours to cover the same distance, considering logistical constraints.

Source: Adapted from https://fr.digi.com/ (Accessed July 6, 2024).

4.2 Consensual Surveillance

In a world where surveillance is omnipresent, a new form of control is emerging: "consensual surveillance." Instead of imposing surveillance systems by force, some companies and governments are encouraging individuals to voluntarily submit to surveillance in exchange for immediate benefits, such as convenience, price reductions, or a personalized customer experience. An example of this in the logistical field can be found in delivery apps that integrate real-time tracking features for product delivery (dos Santos *et al*., 2017), as seen with Amazon (see Figure 2). Users willingly agree to share their location, preferences, and other personal data in exchange for a better shopping experience or faster delivery. This data is then leveraged not only to optimize services, but also to create detailed consumer profiles that can be used for targeted marketing and behavioral manipulation, subtly influencing purchasing decisions. Over time, this builds a system of constant mass surveillance disguised as a benefit to the consumer.

The model of consensual surveillance is based on an exchange between the consumer and the company, but this exchange is often unequal. Consumers typically do not fully understand the extent of the information being collected or the implications of its use. Moreover, consent is sometimes obtained indirectly, making data collection almost invisible to the consumer, who may unknowingly opt for impulse purchases without realizing the broader consequences (Shahzad *et al.*, 2024). For instance, in online loyalty programs, where the goal for companies is to stabilize the flow of products, consumers are encouraged to sign up for consumption tracking initiatives without a clear understanding of the potential privacy risks—particularly when it involves sensitive products, such as those related to intimate use or regular alcohol consumption. Through these mechanisms, mass surveillance becomes an accepted and even desirable social norm, contributing to an environment where individuals actively, and sometimes unconsciously, participate in their own surveillance.

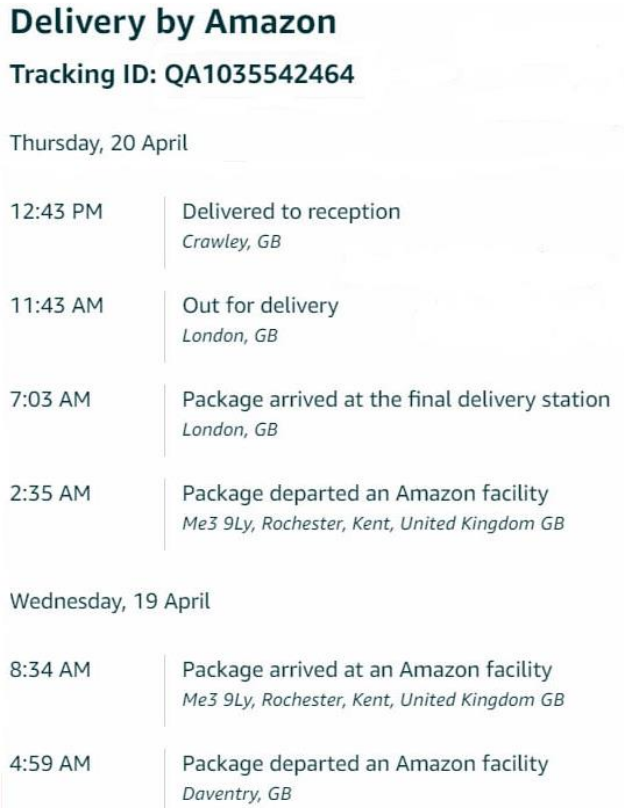

Figure 2. Amazon tracking system

Source: Company document.

4.3 Ethical Issues

As the ability to collect, analyze, and manage data in logistics grows, pressing ethical concerns have emerged. One of the most significant challenges is the protection of personal information: what should be done with data collected on purchasing behavior, consumer journeys, or lifestyle habits? How can this data be utilized fairly and responsibly, without infringing on privacy or rights? Companies argue that exploiting data allows them to better address targeted consumer needs while enhancing the efficiency of their services. However, this optimistic vision often masks potential abuses, which are widely acknowledged. For instance, the misuse of data by companies to generate profits can result in large-scale discrimination (Custers *et al.*, 2013), limiting access to services or products for individuals deemed "less profitable" or "less reliable." This raises critical concerns about fairness, equity, and the potential for societal harm in the digital era, where privacy is increasingly compromised for profit.

Governments, for their part, can exploit these same data as part of totalitarian strategies of social control. By cross-referencing logistical data with other governmental databases, they can establish social or economic profiling systems, categorizing citizens based on potentially arbitrary or discriminatory criteria. These systems can result in discrimination in access to credit, education, or other essential public services, exacerbating existing inequalities and creating new forms of social exclusion. In response to these challenges, protective regulations have been implemented to regulate the use of personal data and ensure greater transparency and accountability. However, the question remains: how can we ensure ethical and fair management of logistical data in "surveillance capitalism," to use Zuboff's (2019) term, where the collection process is becoming increasingly intrusive, pervasive, and omnipresent? In short, what political responses are feasible and effective in addressing and mitigating these complex issues?

4.4 Regulatory Initiatives

As mass surveillance and data collection have become ubiquitous, legislative and regulatory efforts have been implemented to frame these practices and limit their adverse effects on individuals' privacy. One of the most

significant examples is the General Data Protection Regulation (GDPR), introduced by the European Union in 2018. The regulation marks a major milestone in the recognition of individuals' rights regarding their personal data, imposing stringent obligations on companies and institutions concerning its collection, use, and sharing (Hoofnagle *et al.*, 2019). According to the GDPR, companies must obtain explicit consent for all data collection, provide transparent information on how the data is used, and adhere to principles of minimal data use. Furthermore, severe penalties are prescribed in cases of non-compliance, with fines reaching up to 4% of a company's global revenue. These measures reflect the increasing global concern over data privacy and the need for robust protection in an age of pervasive mass surveillance.

While this regulation represents significant progress, it remains insufficient in the face of rapid technological change. Increasingly sophisticated logistical systems, incorporating technologies such as the IoT and blockchain, are evolving at a much faster pace than legislation can keep up with. Legislation to protect privacy and regulate personal data is often seen as a delayed and reactive effort, struggling to adapt to the complexity of today's innovations and their broader societal impact. High-tech companies, particularly those in the logistics sector, often wield considerable influence over public policy through lobbying, which significantly slows the introduction of stricter regulations that could better address modern challenges. This creates serious concerns about the effectiveness of current regulations, particularly in the face of mounting pressure from private corporations that benefit greatly from the data they collect, while sometimes exploiting loopholes and circumventing existing legal limits. In short, mass surveillance highlights the urgent need for more proactive and adaptive legal frameworks.

5. Discussion and Conclusion

In a context where advanced logistical technologies are continually redefining the boundaries between economic efficiency and the management of social flows, examining their role as tools for mass surveillance raises critical ethical and societal questions. As logistics, traditionally viewed to optimize product flows, evolves into a powerful vector of social control, it brings significant issues related to privacy, individual liberties, and the concentration of power to the forefront. Major innovations, such as blockchain, IoT, and the use of delivery drones, are central to the growing mass surveillance dynamic in which the lines between convenience and intrusion are becoming increasingly blurred. We summarize the key contributions and limitations of our analysis, while looking ahead to future research that will help us better understand the broader societal changes underway and their long-term implications.

5.1 Contributions

By exploring advanced logistical technologies, this article highlights their potential to transform managerial practices into tools of social control. Through the massive collection of personal data and the management of product and human flows, logistics emerges as a pervasive infrastructure in everyday life, both practical and potentially oppressive. Two key conclusions can be drawn. On one hand, it is crucial to emphasize the central role of data collection in transforming logistics into a surveillance tool; total product traceability via blockchain, IoT and the use of delivery drones are not merely logistical solutions—they are increasingly becoming instruments for mapping, tracking, and monitoring human behavior in real time. On the other hand, an ethical debate must be initiated, addressing the paradoxical tension between the clear benefits of efficiency, security, and convenience, and the significant risks posed to privacy, autonomy, and individual liberties.

With reference to potential abuses, this article also offers a framework for reflecting on the social consequences of expanding surveillance. In China, for example, the social credit system illustrates how data management can create invisible forms of segregation and reinforce social control mechanisms through the traceability of individual behavior. Moreover, in liberal democracies, the centralization of personal data by private companies can fuel similar—though less visible—mechanisms, where access to certain services or opportunities is conditioned by opaque algorithms. This raises critical questions about the impact of mass surveillance on social cohesion and individual liberties. Our analysis underscores the profound implications of the convergence between logistics and mass surveillance, which could fundamentally alter power dynamics between citizens, companies, and governments. It also calls for a critical examination of the economic models and societal values that these innovations promote.

The novelty of this contribution lies in its effort to address part of the gap in mass surveillance research. Most existing studies focus primarily on the technical or normative aspects of logistics technologies, such as their operational efficiency or regulatory compliance (Hoofnagle *et al.*, 2019; Brau & DeCampos, 2024). This focus often overlooks broader societal implications, particularly their impact on individual liberties and the reconfiguration of power dynamics. For instance, the study by dos Santos *et al.* (2017) concentrates on optimizing delivery processes through IoT, yet it overlooks the subtle mechanisms of consensual surveillance. Similarly, while Zuboff (2019) offers an insightful analysis of "surveillance capitalism," she does not delve into the logistical dynamics that underpin it.

Moreover, much of the research lacks empirical perspectives, especially regarding how individuals perceive and engage with these technologies in their everyday lives. For example, Shahzad *et al.* (2024) examine the impact of algorithms on consumption behavior but do not incorporate testimonials or case studies that reveal the psychological and social dimensions of consensual surveillance.

Thus, in contrast to a purely technological or economic approach, our article highlights the convergence between logistics, mass surveillance, and ethical concerns. It posits that logistics, traditionally viewed as a tool for facilitating inter-organizational exchanges of products and information, is evolving into a sophisticated governance infrastructure that links the collection of personal data to mechanisms of behavioral control, subtle influence on individual choices, and predictive modeling of future actions. The analysis also examines the normative implications of these dynamics, questioning the responsibilities of both public and private entities in data management and their far-reaching effects on fundamental liberties and individual autonomy. In short, this exploratory research stands out for its commitment to integrating a critical, systemic, and forward-thinking perspective into a field often dominated by neo-liberal agendas focused on immediate efficiency and shareholder interests.

5.2 Limitations

As with any exploratory research on an original and innovative topic, this analysis has certain limitations. The field of logistics is constantly evolving, and traceability and mass surveillance technologies are still in the deployment phase, meaning their full societal implications are not yet fully visible. Delivery drones, IoT and blockchain are not universally integrated into all supply chains, and their use can vary considerably from country to country based on local regulations, technological adoption, and infrastructure development. Furthermore, this article primarily focused on the negative impacts of mass surveillance on individual liberties, without fully addressing the potential benefits that certain forms of mass surveillance could offer, particularly in enhancing security, preventing fraud, or improving public safety. For instance, product traceability could be used to ensure product quality, prevent criminal activity, improve consumer trust, and ensure more efficient supply chains.

In addition, the analysis primarily took a macro-societal perspective without incorporating concrete examples that illustrate how citizens, companies, or governments interact with logistical technologies daily, aside from the three illustrative vignettes. As a result, insufficient attention has been given to the diversity of regional or sectoral approaches, especially in contexts where logistics is implemented with sustainable development or social inclusion goals in mind. These settings suggest diverse examples, such as the use of intelligent solutions to optimize supply chains in rural areas, or the adoption of community-driven initiatives aimed at reducing the environmental impact of transport. Finally, the ethical concerns raised using logistical data have only been explored from a theoretical perspective, whereas they would benefit from a more comprehensive analysis through empirical studies, particularly focusing on issues related to the confidentiality, transparency, and accountability of algorithms.

5.3 Research Avenues

Research avenues in the nexus of logistics and social control are vast and promising. Firstly, a deeper exploration of international regulations would be essential to better understand how different countries approach privacy issues. Comparing countries where mass surveillance is more centralized—such as China—with those that prioritize privacy protection—such as the European Union with its GDPR—could offer valuable insights into the future of logistical technologies and their evolving regulations. Secondly, it would be relevant to study the social and cultural implications of new forms of mass surveillance in specific contexts, such as smart cities, where the management of product and human flows is directly linked to urban planning, governance, and public policy. This investigation could help us better understand the tensions between technological innovation and societal objectives, as well as propose more inclusive, ethical, and sustainable frameworks for future technological development.

Finally, the ethical use of logistical data deserves particular attention. Future research could explore technical solutions that ensure more transparent and responsible data management while maintaining the efficiency of supply chains. The implementation of informed consent protocols or the integration of citizen control mechanisms could provide valuable avenues for addressing the concerns raised by mass surveillance. In conclusion, the nexus of logistics and social control presents a complex challenge for contemporary societies. While technological advances offer significant opportunities in terms of efficiency, security, and convenience, they also raise critical questions regarding individual liberties, privacy, and autonomy. Achieving a balance between innovation and regulation, and between profit and the protection of human rights, will be essential if advanced logistical technologies are to benefit all without compromising fundamental freedoms in democratic societies.

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