Surveillance Creep in Times of Crisis: The Alipay Health Code and Implications for Privacy, Civil Liberties, and Social Control

Jerry Li, Dr. Sarah Clayton

Ivy Mind: High School Research Program, the Social Impact of Technology

Corresponding Author: **Jerry Li, Ivy Mind: High School Research Program, the Social Impact of Technology*

Abstract: *This paper illustrates the ways in which governments can infringe upon civil liberties and expand surveillance measures in response to a crisis, through employing technological determinism as a vehicle to examine the Alipay Health Code system. The system was developed by Alipay and introduced in China in 2020 in response to the Covid-19 crisis to help monitor and control the spread of the virus, but was heavily criticized on social media by many Chinese people and was eventually scrapped in December 2022. It argues that surveillance technologies are inherently deterministic as they shape societal structures and power dynamics, often reinforcing existing hierarchies and inequalities. While social constructivism could be employed to analyze surveillance technologies, many stakeholders are not able to actively participate in shaping the discourse, utilization, and governance of these technologies due to limited access to information and power differentials, and the technological "black box" makes it challenging for citizens to fully understand and influence the decision-making processes and algorithms that govern their lives. It further argues that it is inevitable that the government will use another crisis to implement a surveillance system that expands its monitoring capabilities and further encroaches on individual privacy in the future. As a society, we must decide how to balance the need for public safety with the protection of civil liberties, ensuring transparency, accountability, and citizen participation in shaping the deployment and governance of such systems so that the deterministic nature of these technologies is tempered by ethical considerations and safeguards to prevent abuses of power.*

Keywords: *surveillance, technological determinism, China, contact tracing, Covid-19, Alipay Health Code*

1. INTRODUCTION

Surveillance permeates nearly every aspect of society, spanning across numerous domains. It is pervasive and deeply entrenched, and can be an effective tool to identify possible problems and maintain social order. However, the abuse of surveillance driven by greed or power raises social concern and citizens may decide to redress the balance of power with the state through protest or other means.

A new type of coronavirus disease, known as Covid-19, originated in Wuhan, Hubei, China, in late December 2019. This disease, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), resulted in severe pneumonia in some individuals. With its high infectivity and ability to spread between humans, Covid-19 quickly spread across China and eventually evolved into a global pandemic affecting countries worldwide.

What accompanied the spread of the virus was a wave of panic. Starting from China, governments around the world tried to come up with various coping strategies, including but not limited to the development of vaccines, mass quarantine, restriction on traveling, city lockdown, and the implementation of large-scale surveillance. Among all these methods, the Alipay Health Code system has been able to achieve significant success in regulating people's movement and reducing the risk of contagions. This is a digital health tracking system created by Ant Financial Services Group, affiliated with Alibaba Group, as a response to the Covid-19 pandemic. It uses a color-coded QR code (red, yellow, or green) to indicate an individual's health status and their potential risk of spreading Covid-19. To obtain the code, users must complete a health declaration questionnaire through the Alipay app, sharing details about their travel history, current health condition, and potential exposure to the

virus. This is a pass for citizens to travel nationally and to public areas. A red code means instant quarantine and the restriction of movement for others around him. Even though this online surveillance system is able to temporarily control the spreading of virus, stabilizing the society, the implementation of the Alipay Health Code during the Covid-19 crisis raises profound concerns regarding privacy, civil liberties, and social control, as viewed through the lens of technological determinism.

2. LITERATURE REVIEW

The government has used surveillance throughout history to exert power and control over its citizens, especially during times of social crisis, enabling it to monitor dissent, suppress opposition, and maintain social order according to its own interests and agenda. The heightened levels of surveillance then give rise to apprehensions regarding the potential encroachment upon civil liberties and the infringement of privacy rights.

Surveillance is not new; those in power have used it throughout history to monitor and control populations, suppress dissent, gather intelligence, maintain social order, and consolidate their authority. What makes surveillance systems concerning is the opacity, which tends to reinforce the existing power dynamics. When governments, corporations, and other entities gather vast amounts of data from individuals through surveillance systems, online tracking, data brokers, and other means, people's privacy is compromised as their personal information becomes exposed. This data collection has become an integral part of our everyday lives, and often happens without our knowledge or consent (Schneier, 2015).

However, public health surveillance is a unique form of surveillance that focuses on preventing and controlling disease, improving public health, and monitoring the health of communities. It serves as a vital tool in quantifying health issues, understanding disease patterns, detecting outbreaks, facilitating research, evaluating interventions, monitoring changes in health practices, and allocating resources effectively (Lee et al., 2012). Given the social apprehensions regarding public health, a lot of governments consider large scale surveillance to be the best solution to either solve or stabilize certain crises.

According to Khan et al (2014), public health and emergency management literature was part of the strategy used to construct the surveillance system in any type, whether it is online, passive, or active. Four axes were used to make it. The first factor was the type of natural catastrophe, the second the stage of the disaster cycle, the third the impact of the disaster (on the economy, infrastructure, and health), and the fourth the primary finding of the study (i.e., injuries or infectious diseases).

As Nsubuga et al. (2006) suggested in their chapter on Public Health Surveillance: *A Tool for Targeting and Monitoring Interventions*, there are multiple types of surveillance during public health crises, including:

1. Active and passive surveillance: data collection by organization (active) or clients (passive)

2. Categorical surveillance: Active or passive systems focusing on diseases/behaviors of interest to intervention programs aid program managers but can be inefficient locally due to multiple form requirements for patients across different programs. Allocating limited surveillance experts to one program neglects others, and reconciling data from diverse systems for national estimates proves challenging.

3. Integrated surveillance: An integrated system combines active and passive approaches to gather information on multiple diseases/behaviors for intervention programs. Program managers should be involved and evaluated based on the integrated system's outcomes. However, maintaining categorical systems for disease-specific data quality control may lead to duplication and inefficiency.

4. Syndromic surveillance: Syndromic surveillance uses clinical features instead of specific diagnoses, such as counting cases of diarrhea instead of cholera. It is a cost-effective and rapid method, commonly used in developing countries. However, the lack of specificity requires additional investigation at higher levels, as one disease causing a syndrome can mask an epidemic of another.

It is important for governments to be conscious about the types of surveillance implemented to the citizens after the consideration of each unique circumstance. For instance, the Chinese government needs to examine whether large scale active surveillance is effective when it is facing a population of billions. The poorly applied or abuse of the surveillance system will lead to the deterioration of situations; for example, the weak surveillance system in Africa during Covid period actually worsened the situation with its connection with Ebola virus (Aborode, 2021). Since large quantities of supplies have already been used on Ebola treatment, the appearance of Covid-19 further scared the resources. Under such a chaos, the surveillance system implemented in Africa, which has "inadequate involvement and contribution of resources from stakeholders" (Aborode, 2021, p. 2), led to misjudgement of data and ineffective application of medical infrastructures. This sets a great example of how surveillance systems can be misused to create worse situations, giving us implications on future development of certain systems.

3. SURVEILLANCE DURING CRISES

Throughout history, governments have typically used surveillance monitor and acquire all the information they can when encountering a global crisis, such as a natural disaster, a terrorist attack, or a public health emergency, as fear and uncertainty creates a fertile ground for the government to justify the implementation of more extensive surveillance initiatives under the guise of protecting public safety. During the later part of the Middle Ages, for example, governments in Western Europe took on the responsibility of safeguarding the health and providing healthcare for the inhabitants of their towns and cities. This entailed implementing basic methods of tracking illnesses, enacting regulations to prevent pollution of streets and public water sources, issuing guidelines for proper burial practices and food handling, as well as offering certain types of care (Thacker & Berkelman, 1988). In the 17th century, John Graunt, a statistician, examined the Bills of Mortality, which were weekly records that provided information about births, deaths, and causes of death, to monitor disease occurrences in London. Then, in 1766, Johann Peter Frank proposed a more comprehensive system of public health surveillance in Germany, which encompassed areas such as school health, injury prevention, maternal and child health, and the maintenance of public water and sewage systems. Information was then collected among each section, culminating into a comprehensive assessment of public health. Furthermore, specific governmental measures were established to safeguard public health during this period (Thacker and Berkelman, 1988).

The principles outlined by Foucault (1975) in his analysis of the Panopticon's constant observation of prisoners align with the implementation of such governmental measures. The Panopticon design creates a situation where the prisoners are aware that they are under surveillance, leading to self-discipline and control of their behavior. Foucault (1975) also extends the concept of the Panopticon beyond the prison system to various other social institutions and mechanisms of power in society. He argues that the Panopticon serves as a comprehensive framework of disciplinary power, functioning through observation, surveillance, and the internalization of norms and expectations. This is something that we see today through the increasingly sophisticated methods employed by governments to monitor and control their populations.

Global crises are often used as catalysts to justify the expansion of surveillance mechanisms, claiming the need for enhanced security and protection of public health. For instance, the 9/11 terrorist attacks led to the introduction of the Patriot Act, which resulted in significant expansions of surveillance powers and increased monitoring capabilities by government agencies. The Patriot Act aimed to strengthen national security and prevent terrorism by granting U.S. law enforcement and intelligence agencies expanded surveillance and investigative powers. It allowed authorities to access a wider range of personal records, including financial, medical, and educational information, and enabled increased surveillance of communications and internet activities. While this law granted broader surveillance powers to intelligence agencies and law enforcement, and enabled authorities to access a wide range of personal data without the need for a warrant, the US government suggested that it aimed to find the balance between the protection against terrorism and the preservation of civil liberties (Legis 435). Lyon (2003) explains that everything changed in regards to surveillance after 9/11.

"The loss of some liberties is portrayed as the price paid for security, which is another dubious deal. While tracking down the perpetrators of violence is entirely appropriate and laudable, reinforcing surveillance without clear and democratically defined limits is not" (Lyon, 2003, p. 1).

The London Bombings in 2005 also exemplify the correlation between major disasters and the subsequent proliferation of surveillance systems. There was an increase in the utilization of Close-Circuit Television (CCTV) surveillance systems. While CCTV cameras were already in place throughout London, the attacks promoted a surge in their installation and coverage (Gill et al, 2008). Authorities acknowledged the value of CCTV cameras in monitoring and deterring suspicious behavior, as well as aiding in the identification and investigation of potential suspects. The expansion of the CCTV network aimed to enhance surveillance, particularly in busy areas and transportation hubs.

The balance between national security and individual liberties in relation to surveillance has a significant impact on the rights of citizens. The existing and emerging technology have also played an important factor in the exertion of some "hard" and "soft" security strategies (Levi and Wall, 2004). :

Hard security strategies focus on physical measures and strong deterrents to protect assets and maintain security. These strategies typically involve tangible and visible security measures such as barriers, locks, alarms, surveillance cameras, and armed personnel. The main objective of hard security is to prevent unauthorized access, control entry points, and deter potential threats through visible and tangible means. Examples of hard security measures include security fences, access control systems, and security guards.

Soft security strategies, on the other hand, emphasize non-physical and non-coercive methods to address security concerns. These strategies typically focus on addressing underlying causes of conflicts, building trust, and promoting cooperation. Soft security approaches often involve diplomatic negotiations, dialogues, confidence-building measures, and cooperative frameworks to mitigate security risks. The main objective of soft security is to prevent conflicts, foster stability, and promote peaceful resolutions. Examples of soft security measures include diplomacy, negotiations, conflict resolution mechanisms, and international cooperation frameworks.

No matter what surveillance systems are implemented, it is a common coping mechanism derived from history by governments. When facing a crisis, getting the knowledge of the whole picture, which is information on every aspect of society, is often a promising start. However, none of them can perfectly balance between the demand for information to form solutions and the concerns on security raised by the public.

4. THE CHINESE GOVERNMENT'S APPROACH TO SURVEILLANCE

With the rapid advancements in technology and the increasing availability of data, in recent years, the Chinese government has utilized surveillance technologies on an unprecedented scale to monitor its population. Whether it is under worries for public health or safety, the expansive application of various kinds of surveillance technologies has raised distress among citizens.

Currently, there are three aspects of issues that are under the surveillance of the Chinese government: (1) public health, (2) Internet for control on national conspiracy, and (3) mortality. The last aspect seems reasonable, because accurate and up-to-date data on mortality is crucial for informing the creation, execution, and assessment of health policies by governments. However, China, with its population of 1.41 billion, has not yet implemented a comprehensive vital registration system (Liu at al., 2015). It can be helpful to use surveillance to manage a population as vast as 1.41 billion people, especially as The collection of birth and mortality data does not inherently jeopardize people's privacy. However, the surveillance upon social media and public health, which necessitates extensive information gathering, raises significant concerns among many people. For example, as King et al. (2017) reveal in their study on Chinese social media,there has been persistent speculation about the Chinese government's alleged employment of a substantial workforce, possibly numbering around 2 million individuals, to covertly introduce a substantial volume of pseudonymous and misleading content into mainstream social media platforms, presenting them as authentic viewpoints from regular individuals. Furthermore, various actions have been taken based on the observation of surveillance

systems in social media. The Chinese government's censorship of blogs addressing certain political topics has occurred in conjunction with an expansive surveillance apparatus, raising worries about the erosion of privacy and the potential for state intrusion into individuals' lives (Wang and Hong, 2008).

Other forms of surveillance infrastructures have also been employed by the Chinese government. The Social Security system in China incorporates a comprehensive surveillance infrastructure that includes a social credit score (SCS) -based system of rewards and punishments. This system not only determines access to various resources such as education, markets, and tax deductions for both citizens and organizations, but also plays a significant role in monitoring and controlling societal behavior. Furthermore,

It is essential to approach discussions about Chinese surveillance and indeed China's social credit score system with an understanding of the country's unique political and social landscape. China's long-standing emphasis on social harmony and stability, rooted in Confucian principles and the concept of a "harmonious society" influences the development and implementation of such surveillance systems. Some researchers, such as Liang et. al (2018), suggests that China's social credit score system is a complex framework primarily concerned with regulating financial and commercial activities rather than political ones.. Whereas, other researchers and indeed the media, especially in the west, express valid anxieties and criticisms regarding China's social credit score system.

5. TECHNOLOGICAL DETERMINISM AND SOCIETAL IMPLICATIONS

Technological determinism asserts that technological development drives societal change and shapes human behavior. According to this perspective, technology is considered the primary driver of social, economic, and cultural transformations, with little room for human agency or social context (Ellul, 1964). It suggests that the introduction and diffusion of new technologies have inherent and predictable impacts on society. The discussions of technological determinism have existed across multiple fields, with each holding some different understandings upon the factor of the role that technology   plays in society. Supporters argue that technology is an autonomous and all-encompassing force that shapes and controls various aspects of human life (Ellul, 1964). Ever since the development of computers dated back to the early 19th century, people have developed this gradual dependence on technology. All the way from automated streamline, data collection system, and smart furniture, it is hard to deny the fact that technology encompasses not only the artifacts themselves but also the actors, organizations, policies, and infrastructures that surround them (Bijker, 1987).

The expansion of surveillance technologies, driven by technological determinism, often leaves citizens with limited control over their personal data, privacy, and overall surveillance practices. One key factor contributing to this limited control is the asymmetry of power between individuals and the entities wielding surveillance technologies. Even though the development of surveillance does not fall under "Hard TD"--technology is the main or the only significant driver (Adler, 2006), the ripened technology around information control gave rise to surveillance in every country. The use of SCS, CCTV, facial recognition, and Covid QR codes were not possible if there were no such technology. Big data and computational revolutions have also substantially promoted surveillance and social sorting (Cheney-Lippold, 2018). The value of data was further emphasized with the help of advancing technology.

Critics of technological determinism assert that it is important to note the multidimensional nature of technological change, as societal change is not solely driven by technological forces but also shaped by social actors, cultural values, and power dynamics (MacKenzie, 1999). Scholars of the Social Construction of Technology reject technological determinism as they believe that technology is socially constructed, shaped by the interactions and negotiations of various social actors, and not an autonomous force driving societal change (Bijker et al., 1987) Society and technology have a mutual relationship and technologies are socially shaped and influenced by various actors, institutions, and contexts. These scholarly works and debates contribute to an enhanced comprehension of the relationship between technology and society. They recognize the reciprocal influence and co-creation that takes place, rather than attributing all social change exclusively to technological factors. In this

vein, Winner (1980), particularly in his influential article "Do Artifacts Have Politics?", asserts that technological artifacts have embedded political and social values. He suggests that technologies are not neutral but can shape power dynamics and social structures, thus challenging deterministic views.

However, while SCOT offers a valuable perspective for analyzing the social implications and ethical considerations of certain technologies, a deterministic approach is more suitable for studying the impact of surveillance technologies given the limited agency and control individuals have over their implementation and use. As technological advancements outpace legal and policy frameworks, and governments and private companies often implement surveillance systems without citizen consultation, citizens are increasingly marginalized and left with limited recourse to challenge or influence the proliferation of surveillance systems. This reinforces a power imbalance where individuals' privacy and civil liberties may be compromised without their consent or meaningful input, and it can therefore be argued that surveillance technology indeed plays a significant role in shaping society with limited human agency.

The implementation of surveillance systems in China serves as a compelling example that highlights the close connection between technological determinism and the development of surveillance systems on a broader scale. By examining the Chinese context, we can discern how technological determinism influences the design, implementation, and impact of surveillance technologies. The expanding database collected and generated by all sorts of surveillance technology allows the government to supervise people's lives more effectively and comprehensively, gradually exposing people's privacy to bigger institutions for "proper usage" within a black box (Pasquale, 2015).[1]

6. THE HEALTH CODE SYSTEM

Institutions and authorities often believe that it is helpful and necessary to carry out surveillance during a public health emergency to ascertain the breadth and depth of the health consequences on the impacted populations (Public Health Surveillance During a Disaster, 2022). In order for public health officials to assess community health impacts, data on deaths, injuries, and illnesses is often systematically collected, analyzed, and interpreted. Disaster surveillance enables the government to pinpoint interventions, track disease trends, identify action items, and identify risk factors. It enables governments and officials to examine potential issues with planning and prevention as well as the effects of disasters on human health.

However, surveillance during times of crisis tends to cover more comprehensive aspects of people's lives. With the government facing financial drawbacks during the early stages of the pandemic and citizen riots, the Chinese government has decided to implement a Health Code system which is an integration of various databases to trace public health situations under extreme circumstances and maintain the vulnerable national security, both socially and economically.

7. OVERVIEW OF THE ALIPAY HEALTH CODE SYSTEM

Covid-19 broke out in 2020. The Chinese government dealt with the crisis by implementing a multifaceted approach that included stringent surveillance measures, extensive contact tracing, and the utilization of advanced technologies for monitoring and controlling the spread of the virus. One such mobile technology implemented Covid QR codes to keep track of citizens' Covid status to monitor public health.

The Chinese government took various measures following the breakout of Covid-19, including epidemiological investigation, tracing confirmed cases and their contacts, and centralizing the mobilization of national resources, border control, and technological research, which contained health codes as a part of it (Cheng et al., 2021).

The Alipay Health Code was a digital health tracking system developed by Ant Financial Services Group, an affiliate of Alibaba Group, in response to the Covid-19 pandemic. It assigned individuals a color-based QR code (red, yellow, or green) based on their health status and potential risk of Covid-19 transmission which was used to determine access privileges and entry restrictions to various

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[1] A black box refers to complex systems, algorithms, and decision-making processes that are opaque to outsiders, preventing individuals from understanding how they work and the consequences they entail.

locations and services. To begin, users were required to provide personal details including their name, national identification number, and physical health status (e.g., presence of fever, fatigue, dry cough). Then they were required to fill out a health declaration questionnaire, providing information about their travel history, current health condition, and potential exposure to the virus. Users were also required to update their physical health status on a daily basis and facial recognition was used to streamline the verification process and match an individual's face with their personal information. The app also utilized spatial-temporal data collected from popular apps like Alipay and WeChat, which are commonly used by Chinese citizens in everyday life. By leveraging smartphone GPS and network carrier information, geolocation data can determine whether users had visited areas with widespread or ongoing Covid-19 transmission. Temporal data assessed the duration of time spent in high-risk areas. Lastly, the Health Code system utilized user networks and online transactions to assess whether individuals had come into contact with potential carriers of the virus (Liang, 2020). Health codes were integrated with various data sources, including health records, travel history, and Covid-19 testing results. This integration allowed authorities to make informed decisions about an individual's risk level and take appropriate measures accordingly.

The Health Code was mandatory for those who wanted to visit public spaces in over 300 cities in China (Mozur et al., 2020). Individuals needed a green QR code in order to travel outside their residence city. The yellow code indicated a medium risk level, suggesting that the individual may have been exposed to potential sources of infection or have traveled to areas with a moderate prevalence of Covid-19 cases. Whereas, individuals assigned a red code were considered to have a higher likelihood of being infected with the virus or being in close contact with confirmed Covid-19 cases. If individuals had a red or yellow QR code, they were often put into quarantine immediately and disconnected from people around them; although, the exact criteria for assigning each code may have varied depending on the specific guidelines and protocols established by the health authorities. Once a person entered a state of quarantine, databases from public cameras and tracking systems associated others who had interacted with them, and provided them with a yellow code. Individuals with a yellow code were subjected to certain restrictions or requirements, such as undergoing additional testing, observing self-quarantine, or limiting their access to public places, until they can demonstrate through a Covid test that they are no longer a potential risk and therefore they can recover their personal freedom.

Tyson (2022) highlights in her report that while the QR code system was initially implemented as a measure to control the spread of the coronavirus, concerns have been raised regarding its potential for expanding surveillance capabilities. Critics argue that the system could be used to collect and monitor vast amounts of personal data, infringing upon individuals' privacy rights. They express anxiety about the government's ability to track individuals' movements and create extensive profiles based on the data collected through the QR code system (Tyson, 2022).

8. EXAMINATION OF THE ALIPAY HEALTH CODE SYSTEM THROUGH THE LENS OF TECHNOLOGICAL DETERMINISM

The Alipay Health Code system embodies technological determinism by showcasing the power and control exerted through technology over individuals and society, with limited avenues for citizen input or influence. The system, created by the Chinese government in partnership with Alipay, uses artificial intelligence and big data to assign people a color-coded health status based on their travel histories and medical issues. Authorities have a lot of control over monitoring and controlling public health thanks to this consolidated control over health information, and they can also restrict people's access to and movement inside different public locations based on their health. As the system dictates access to public spaces and services based on an algorithmic assessment, it highlights the potential for technology to shape social behavior and restrict personal freedoms. The system's centralization and impact on individual liberty serve as a stark reminder of the consolidation of power in the hands of those who create and manage technology. The process of surveillance is often shrouded in secrecy, creating an impenetrable black box that leaves the public and society as a whole in a state of ignorance and vulnerability (Pasquale, 2015). The lack of recognition for possible bias or discrimination in the process of creating such surveillance systems further facilitates the centralization of powers (Smith, 1994).

The Alipay Health Code system also exemplifies the possibility of massive data collection and surveillance. The technology gathers personal information that can be used to track and monitor people, jeopardizing their privacy and liberty. The system's technological underpinnings strengthen the interplay of power between those in charge and those being watched. The Chinese government has been increasingly utilizing technology and data to strengthen its surveillance apparatus. It highlights instances where personal data collected through various means, including QR codes, has been used for purposes beyond public health monitoring, such as monitoring citizens' political activities and social behavior (Tyson, 2022). It is essential to explore the development of surveillance systems with the implication from Covid QR codes, which shows the power hierarchy of the government on controlling and managing its citizen's information.

In response, the public may develop innovative strategies to circumvent or counteract the pervasive surveillance, aiming to preserve their privacy and assert their autonomy in an increasingly monitored society. Supporters of the system, who are more optimistic about surveillance, emphasize how well it tracks down contacts and contains the virus. They contend that the use of QR codes enables authorities to immediately detect possible Covid-19 cases and take the necessary precautions to stop further spread by tracking people's health status and travel history. Critics do, however, raise legitimate worries about the system's effects on human freedoms and privacy. They contend that the centralization of data collection for individuals via the QR code system raises uneasiness about surveillance and possible misuse of authority by authorities. Beyond the immediate context of pandemic containment, there are worries regarding the long-term storage, access, and potential exploitation of people's health and travel information. In response to the government's "zero Covid" policy tightening restrictions and the spread of more contagious varieties, there were protests and demonstrations all over China (Dyer, 2022). The growing surveillance on people's lives, spreading out from the Health Code system, also posed serious issues for citizens as they concern the disclosure of their privacy. People across the nation used a blank paper to demonstrate the restriction on conversations around Covid policies; in other words, petitioning for free speech. Certain individuals have made the case that this action serves not only as an expression of the suppression of opposing views but also as a daring act, almost questioning the authorities with a message along the lines of 'Will you take me into custody for simply holding up a sign that says nothing?' (Murphy, 2022).

The information was soon repressed by the Chinese government and whoever discussed it, by any means, was in danger of being blocked from their social media accounts. Protests in Hong Kong during Covid have also transferred its intention from political suppression to the surveillance system under Covid-19. The pandemic demonstrations shrunk in size, with irregular meetings when protesters organize sit-ins during lunch or congregate in malls to yell slogans (Ismangil & Lee, 2020). After the Xinjiang fire event when people were locked in the burning building and died, protests intensified. Finally after several months of demonstrations, following the government's announcement of a revision to its pandemic policy, workers throughout China removed some of the outward symbols of the nation's zero-Covid regulations, removing health code scanning signs from metro station walls and closing some gates (McCarthy and Cheng, 2022).

9. IMPLICATIONS FOR PRIVACY, CIVIL LIBERTIES, AND SOCIAL CONTROL

9.1. Analysis of the Implications for Privacy from a Technological Determinism Perspective

Surveillance technologies play an important role in strengthening power structures by giving tech giants or governments the supreme authority to access more or less any information they want. The problem within this statement is obvious. As early as when the telephone and telegraph were first introduced, interception of the call, which is the same as capturing the information, the public had raised concerns about privacy disclosure (Landau, 2010). Even though such risk has always existed, the advancement of technology intensifies the concerns as people realize how easy it is to get their private information. Technological determinism states that technology and society influence each other, but under the circumstances of a global pandemic, the society that affects the technology, which is Covid QR code, only consists a small portion of elites and governments, making the rest of the society vulnerable to information leakage (Smith, 1994).

In addition, with the ability to gather and analyze enormous amounts of personal information, technologies like facial recognition systems, biometric data gathering, and data analytics have raised worries about privacy erosion and overreaching monitoring (Csernatoni, 2020). The potential for widespread societal acceptance of surveillance is a major cause for concern. There is a chance that people will start to accept constant monitoring as the "new normal" as improved surveillance technologies spread and are integrated into more elements of daily life. This normalization can erode public awareness and resistance to privacy invasions by making individuals less sensitive to the possible intrusiveness of surveillance.

With the rapid advancement of sophisticated monitoring technology, safeguarding personal information has emerged as a critical and pressing concern. Large-scale personal data gathering, storage, and exchange provide risks for abuse, illegal access, and data breaches. To secure people's privacy and stop illegal access to sensitive information, it is essential to implement strong security mechanisms.

The interconnectedness of surveillance systems and the widespread data sharing between government entities and businesses raises significant concerns regarding data collection, aggregation, and profiling. This dynamic amplifies the potential for invasive breaches of privacy, abuse of power, and the erosion of individuals' fundamental rights to autonomy and self-determination. In-depth profiles of people can be created using data from a variety of sources, including social media, public records, and surveillance footage, allowing for precise tracking and targeting. Personal autonomy is put in danger because of the possibility of discrimination, social categorization, or manipulation based on these profiles.

9.2. Examination of the Impact on Civil Liberties and Social Control from a Technological Determinism Perspective

The impact on civil liberties and social control with regard to the growth of governmental authority and the potential deterioration of those rights can be analyzed from a technological determinism perspective. Mass surveillance technologies, especially if left unchecked, can reinforce the notion of technological determinism by exerting autonomous influence over societal structures, norms, and power dynamics. The widespread gathering of data achieved through surveillance enables governments to monitor and regulate people without their explicit consent or knowledge, raising concerns about privacy, civil liberties, and the potential for abuse of power. Although these technologies may be first implemented as short-term solutions to solve particular crises or security preoccupations, there is a risk that they may eventually become permanent fixtures, which will continue to erode civil freedoms.

By framing the Covid health code as a tool for public health management and disease prevention, the Chinese authorities aimed to promote widespread adoption and compliance among the population. The Chinese Covid health code functions as a contemporary embodiment of the panopticon concept, where individuals are subjected to pervasive surveillance and monitoring without their explicit knowledge, creating a sense of constant scrutiny and the potential for self-regulation. It's so much more than a "health tracker" as it also collects people's health records, location, travel history, as well as many other aspects of their lives.

Apprehensions about the excessive invasion of people's privacy and the possibility of misuse are raised by the development of government authority through surveillance technologies. Governments may be able to follow citizens' whereabouts and forecast their behavior through the collection and analysis of enormous volumes of personal data. Individuals may self-censor or modify their behavior out of concern that they will be tracked and targeted, which can have a chilling impact on freedom of expression and association. Additionally, it raises concerns about how security and civil liberties should coexist, as the level of surveillance may exceed what is appropriate and essential in a democracy. Technology is shaped and determined by social factors, so it has the potential to turn things around as well, using the close connection with society, including data and information, for the fulfillment of greed.

Furthermore, a major worry is the possibility for mission creep in monitoring systems. Temporary measures implemented in response to catastrophes, such as public health crises or threats to national security, can become commonplace and remain past their original intent. This could result in ongoing

surveillance and tracking of people long after the crisis has passed, extending the authority and control of governments. Mission creep threatens the fundamental principles of checks and balances and society's ability to hold governments responsible for the use of surveillance technologies, potentially leading to the establishment of a surveillance state where civil rights are further compromised and individuals' privacy is increasingly eroded..

The notion of technological determinism asserts that the trajectory and impact of technological advancements are driven primarily by their own intrinsic properties, disregarding the influence of other factors. Certainly, the public at large had little say in the implementation and design of the Covid health code in China, as it was largely dictated by the government without extensive consultation, opportunities for meaningful public participation, or providing ample avenues for public discourse or consent. The technology certainly appeared to be an autonomous force, dictating the surveillance practices and exerting control over individuals' daily lives, diminishing their agency in the process. The health code was forced upon them, significantly altering societal dynamics and challenging established norms of privacy and personal autonomy.

In order to redress the balance, surveillance technology must be governed by strong legal frameworks and oversight procedures that are fostered through an inclusive and meaningful public discourse in order to protect civil freedoms and reduce the potential for excessive social control. To ensure that the use of these technologies stays within the parameters of necessity, proportionality, and respect for human rights, proactive measures should be adopted. In order to maintain civil rights in the face of technological determinism and to balance the potential rise of government authority, transparency, accountability, and democratic engagement are essential. As the public was severely impacted by the Covid health code in China, and they felt that they had been subjected to intrusive surveillance measures without sufficient input or consent, the result being a significant backlash among communities.

The impact of surveillance on social control and human agency is a complicated topic with potential benefits and drawbacks. On the one hand, surveillance can help preserve social order, prevent crime, and promote public safety. The potential for unequal involvement and inadequate responsibility, however, as well as the delicate balance between security and personal privacy, are also issues.

The lack of accountability and openness in relation to surveillance practices is of serious concern. Many surveillance operations run with little oversight, little openness, and little public participation. People find it challenging to comprehend the scope and nature of surveillance activities due to this opacity, which results in a feeling of helplessness and restricted agency. The risk of unrestrained surveillance activities and potential power abuses by those in charge of the surveillance systems increases in the absence of defined guidelines and accountability measures. Technologies such as Health QR code were introduced and forced onto people in daily use. Instead of being clear and transparent, the process and the system do not reveal the information it collected to its users. The inner workings of these systems, such as data collection, analysis algorithms, and decision-making processes, are often shielded from public scrutiny. This lack of transparency prevents individuals from fully understanding how their data is being collected, used, and shared, limiting their ability to exercise control over their personal information and challenge any potential misuse (Pasquale, 2015). The data and how it is used is "black boxed", away from public view.

Furthermore, monitoring has a negative impact on marginalized communities and can deepen power disparities and inequality. Further marginalization and social control may result from the excessive targeting of some groups and the unequal participation in decision-making processes. For instance, profiling based on racial, ethnic, or socioeconomic status may lead to higher levels of surveillance in underprivileged populations. In addition to restricting individual agency, this unfair treatment also upholds social injustices and systemic biases. Most of the public under the surveillance of Covid health code is the target, or victim.

10. CONCLUSION

Since the inception of the first surveillance systems, despite their limited effectiveness and scope, concerns about privacy intrusion have been consistently raised. Entering the 20th century, there was a boom of new technologies: innovations such as computers, mobile phones, or the internet, which all

connect with different aspects of surveillance systems. The capacity for surveillance has been greatly improved by technological improvements. The speed and precision of surveillance data have increased with the advent of modern data collection techniques, such as electronic health records and real-time reporting systems. The early detection of epidemics and prompt action are made possible by advanced analytics and machine learning algorithms that enable the discovery of patterns and trends in massive datasets. Additionally, combining data from other sources, like social media and remote sensing, enables a more thorough picture of the state of public health. Overall, technological developments have transformed surveillance, enabling more accurate and effective tracking of diseases and interesting behaviors. This is a trend of modernity developed by the rise of technology, as the central powers, sometimes governments, are trying to refine the administrative system by better collecting people's personal data (Misa et al, 2003). By this means, society can evolve in line with and in response to the influence of technologies that shape and impact societal development.

Among all these technologies, a timely invention, the Alipay Health Code system, aiming to aid the deteriorating Covid situation, caught the attention of the public and raised concerns. It is a surveillance system that uses three color codes (red, yellow, and green) to define citizens' health states, in order to further ensure public health. As a system that mainly depended both on passive and active data collection to control the spread of virus, it functioned extremely effectively. Even though this online surveillance system is able to temporarily control the spreading of virus, stabilizing the society, the implementation of the Alipay Health Code during the Covid-19 crisis raised profound concerns regarding privacy, civil liberties, and social control, as viewed through the lens of technological determinism.

As explained by the view of technological determinism, the Alipay Health Code system is a technology that is shaped by social perspectives–ways of implementations, data collections, and policies for travel regulations. However, what we see more, instead of humane policies, are more of the expansion of government power and gradual erosion of civil liberties. The comprehensive collection and utilization of information through these surveillance systems undermine the privacy and freedom of citizens. Governments use surveillance technologies to enforce regulations and control certain sectors or activities. The implications of this go way beyond the lack of democracy. The Covid Health Code was essentially put in place by the government without significant public input, possibilities for meaningful participation, or abundant opportunity for public conversation or consent. The technology exhibited a distinct sense of autonomy, acting as an independent force that appeared to influence and shape various aspects of society by monitoring and controlling people's daily lives while simultaneously eroding their agency. It is also because of this lack of consent and comprehension that caused the large-scale backlash in China. As we see from previous sections, protests and online comments against the system surged when people realized the opaque nature of the "Black Box" surrounding it.

In certain instances, social constructivism is also a useful theoretical lens to use to examine surveillance technologies, particularly when citizens actively participate in shaping societal discourse, influencing the utilization of technology, and challenging the dominant power dynamics inherent in these technologies. This lens allows for a deeper understanding of how different stakeholders influence the development and impact of these systems and emphasizes the agency and active participation of all stakeholders, including citizens, enabling a deeper understanding of how public opinion, activism, and social movements can challenge and reshape the trajectory of surveillance practices in favor of individual rights, privacy protection, and democratic principles. In the context of the Alipay Health Code, citizens played a role in influencing its development through their protests against China's stringent zero-Covid strategy and the mobile app that imposed limitations on their mobility. As a result of public backlash, the tracking technology associated with the app was eventually discontinued in December 2022.

Technology is a double-sided sword, in that it can be used as both a force for good and a potential source of harm. Powerful stakeholders such as governments implement surveillance technologies in a manner reminiscent of the panopticon, fostering an environment where power asymmetry is reinforced. Such technologies act upon society where the citizens have little-to-no input in its

development or the decision-making processes surrounding their implementation compared to those in power. Thus, these technologies exhibit a strong tendency towards technological determinism, exerting significant influence and control over societal dynamics and outcomes.

The Chinese government's swift implementation of the Alipay Health Code in response to Covid-19 did help to contain the spread of the virus at the beginning of the pandemic. However, what was intended to be a short-term solution to a temporary crisis turned out to be a prolonged infringement on civil liberties, fueling public dissatisfaction and protests, and raising concerns about the long-term implications of the system.

The Alipay Health Code System is only one of many examples throughout history of a surveillance system that was implemented during a crisis. Due to the inherent inclination of governments to increase power and control over society, it is almost inevitable that another surveillance system will emerge in the future. As a society, we need to consider how to establish safeguards and limitations to prevent the prolonged use of these systems that are implemented in response to a crisis that unduly restrict individual freedoms and privacy so that they remain subject to regular scrutiny. This requires robust legal frameworks, independent oversight, and active citizen participation to ensure that the design, deployment, and operation of such systems align with democratic values.

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