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Seerat Marwaha
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Seerat Marwaha

Iowa State University

Masters of Science in Information Systems

Gerdin- Ivy College of Business

Ames, Iowa- 50014

(515) 357 9460 Office

Internet: seerat25@iastate.edu

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ABSTRACT

Financial consumer rating is a great way to track an individual consumer's financial health, their financial decisions, and their financial management. Many countries use financial consumer ratings to gauge how responsible their citizens are when it comes to money. This allows them to know how good one is with their money, and how risky it is for them to lend any type of loan to someone. (Avery et al, 2003)

Similarly, many countries now also use rating systems in relation to online platforms and in the 'sharing economy', such as eBay, Uber and Airbnb. This rating system helps consumers evaluate their experience and rate in order to help new consumers to make better decisions. (Avery et al, 2003)

However, compared to the already existing rating systems in the Western countries, the emerging Chinese Social Credit System suggests a paradigm shift. The Chinese Social Credit System's target is to formulate a comprehensive rating design based on a mechanism of penalty and reward. (Mac et al, 2009)

The government of the People's Republic of China under General Secretary of the Communist Party of China Xi Jinping's administration has developed a national blacklist called

the Chinese Social Credit System in which China rates its own citizens – which includes everything from offline to online behavior. (State Administration of Taxation, 2014)

Using Information Technology, the Chinese government intends to maintain and fortify legal, regulatory and policy processes and the Chinese Social Credit System is the manifestation of that intention. (Creemers, 2018)

TIMELINE

The World Economics and Politics Institute of the Chinese Academy of Social Sciences started researching and planning the implementation of the Chinese Social Credit system in China as long back as 1999 (Schaefer, 2020). Lin Junyue was one of the most important people behind this research project. (Schaefer, 2020) According to Lin, the initial thought was to just build a financial credit system which would simply gauge financial practices and punish any kind of breach of trust by the consumer. (Schaefer, 2020)

However, in 2009, one of China's central government's most powerful administrations, - The China's National Development and Reform Commission (NDRC) created a social integrity score which not only measured the financial credit but also took into account the social and political behavior of individuals. The regional trials of such a program started in 2009 itself. (Ding and Zhong, 2020)

In October of 2011, Wen Jiabao the then Chinese Premier for the first time formally introduced the Chinese Social Credit System during one of the State Council Meeting. (Lee, 2020). By 2014, eight credit scoring firms were introduced and a national pilot was launched. (Ding and Zhong, 2020)

In 2018, these eight firms got centralized under the People's Bank of China. (Ding and Zhong, 2020)

It was initially intended to standardize Social Credit by 2020. (Hatton, 2015) However, in December 2020, China itself missed the deadline that it had set for itself in 2014. Therefore pushing the implementation further. (Schaefer, 2020)

According to Liu Xinhai who is a researcher at Peking University, the Chinese Credit system is typically led by two entities- namely the NDRC and the Central Bank. One is responsible for integrity credit while the other monitors financial credit. Therefore, the concept that the Social Credit system is only one system is a myth. There is a difference in how both the institutions understand and monitor credit and there is still no true theoretical basis to what exactly the social credit system is. Since there are multiple departments involved, sharing of information is also unclear. (Tseng and Li, 2009)

History

In the US it may be viewed that the Chinese Social Credit System presents an entirely novel concept of social surveillance. However, for a number of centuries, mass surveillance has been implemented in China in order to better detect crimes and the acts of law- breaking. Such kind of surveillance helped serve both a political as well as a military role in discouraging dissidence while strengthening law enforcement. (Barrios, 2020)

China had dynasty rule for centuries and most of the time the dynasties were settled in capitals. Mass surveillances helped facilitate communication between the rural and the capital areas. This helped the rulers maintain a tight grip over the areas that were far away from the capital. (Hsiao, 1972)
It has been documented that the Sung dynasty under Wang An-shih in 1070 was the first one to implement a surveillance system as such. (Hsiao, 1972)

After the Sung dynasty, the Ming dynasty created a four system of geographic and demographic division in order to gather more sophisticated control than the previous dynasties. The four systems were namely the county system, the baojia for surveillance, the lijia for tithing, and the covenant system. (Barrios, 2020)

These four systems were in true sense the very basis of the future systems that were implemented in China- especially the one by the Qing dynasty. (Hsiao, 1972)
The history of surveillance in China is important to understand why the current surveillance system of the Chinese social credit system is so much more socially acceptable by the Chinese citizens. (Kangxi, 1979)

How will China keep a score of social behavior?

China, unlike the US and other countries, has the largest amount of phone payments made each year. People in China almost exclusively rely on their phones to make payments. China took advantage of this modern behavior and has been able to develop these applications called "superapps" namely WeChat Pay and Alipay which are much more than just payment applications. There are built- in social networks within these applications which are able to provide services like ordering food, scheduling a salon appointment, checking into a hotel, making a restaurant reservation, etc. Therefore, all of this data is then harvested to create a social credit score. (The Week, 2018)

Alipay, which is a subset of the E-commerce giant called Alibaba also launched an independent company called "Sesame Credit" just for the purpose of social credit tracking. (The Week, 2018).

How does the Social Credit System work?

The social credit system assigns individuals a score between 350 and 950. The lower the score, the lesser are the perks. In fact, the more an individual's score decreases, the more taxes they have to pay, or the more deposits they have to do to make reservations for hotels, flights, etc. The larger the score, the more the perks. (The Week, 2018).

Video Surveillance

Apart from using phone data, the government tracks people's behaviors and actions in a multitude of other ways. Video surveillance is an excellent way to track everyone through facial recognition. (Galič et al., 2017)

Given the advancements of technology in China, there are apartment buildings already in place which use facial recognition to unlock doors. There are provisions for "smile to pay" which allow customers in restaurants and grocery stores to make easy payment while their facial features are connected to an entire network of data which is further effectively connected to the rest of the data about them. (Galič et al., 2017)

China has invested in and built a number of technological surveillance projects, one of which is known as 'Sharp Eyes'. Sharp Eyes ensures that there are more than 200 million public and private security cameras installed across China. (The Week, 2018)

In 2016, China came up with a 5-year plan to realize 100% coverage of China's public spaces in 2020. Given the global pandemic that hit the world and set the clocks behind a year for every nation's yearly goals, it is safe to say that available reports show that China has gotten very close to hitting its goal of 100% public surveillance if it hasn't absolutely achieved it yet. (Galič et al., 2017)

How Sharp Eyes works is that security cameras are discreetly installed in stores and on the streets, which capture data and integrate this data into surveillance platforms. Thereafter, this mountain of video data is left to artificial intelligence to analyze. (The Week, 2018).

All the digital data that is collected is used to construct unique profiles for each individual on different apps and platforms (Galič et al., 2017)

Chinese Social Credit System- Pilot Projects

The Golden Shield Project

The Golden Shield Project was one of the earliest pilot projects which aimed to integrate all of China's individual surveillance networks into one large central database in order to facilitate information sharing. (Wong and Dobson, 2019)

The government of China enlisted eight Chinese companies and gave them the allowance to build and implement their own pilot credit systems in order to better understand the algorithms at work. (Hatton, 2015)

Alibaba launched a pilot project called Sesame Credit and because Alibaba has an enormous database of consumer information, it gives a Sesame Credit Score to every individual based on factors like financial transactions and timely bill payments. (Hatton, 2015).

On the outside, it might paint a picture, that Sesame Credit is based on credit score systems in countries like the United States. However, in reality, Sesame Credit also takes in account "fulfilment capacity", interpersonal relationship, and as well as purchasing history. (Greenfield, 2018)

In terms of purchasing history Sesame Credit notoriously shapes the buying habits of the Chinese citizens in which it nudges them towards some products while having them avoid the others. (Botsman, 2018)

Credit scores for the consumers are shared publicly. However, the algorithms behind this trade are kept a secret so that the consumers/ users are unaware as to how their personal information is being collected, used or shared by Alibaba. This lack of transparency causes the users to accept whatever score they get as there is no way for them to find out how they got it. (Hvistendahl, 2017)

Honest Shanghai

Honest Shanghai is a separate pilot project which is currently operating in China. Individuals can sign up for the application of Honest Shanghai using the identification number from their resident identity card. They can also sign up using facial recognition technology. (Creemers, 2018)

The Honest Shanghai software mainly depends on facial recognition technology in order to recognize and discover chunks of data associated with an individual consumer across a multitude of private, public and government platforms. As per reports from 2017, this application is able to draw 3000 pieces of information from 100 public authorities. The technology has seemed to advance in the last 4 years. (Schmitz, 2017)

A tailor made credit report based on the data collected and integrated is then produced and put forth. (Wong and Dobson, 2019)

Advanced Technology to gain control- How Are You Being Watched?

According to Foucault's theory of biopower, the regulation of the body is the best and most efficient method for states to govern people (Ball et al, 2014)

With 626 million surveillance cameras as of 2020, China has the world's largest camera surveillance network. (Grenoble, 2017).

Many cameras are implemented in every corner in public and can be seen everywhere on the streets. The government also uses geo-tracking, body scanning, and facial recognition in order to gather information about individuals and identify each and every citizen. (Lianzhang, 2017)

Megvii

Megvii is one of the major technology companies in China which is grandly involved in the implementation of the Social Credit System by designing image recognition and Deep learning software. (Yiting 2017). This Beijing based US$4 billion company develops artificial

intelligence technology for businesses and also is the largest provider of third party software in the world. (Dai, 2019)

Megvii's software product is called Face++ and it is the world's largest open source computer platform. This facial recognition technology is typically used to identify jaywalkers with intention to punish them with a lower credit score. (Barrett, 2018).

SenseTime

Established in Hong Kong, SenseTime is the world's most valuable Artificial Intelligence company. (Russell, 2018)

SenseTime uses technologies like face recognition, object detection, video analysis, image recognition, medical image analysis, remote sensing and autonomous driving to facilitate the development of its AI technologies. (Marr, 2019)

SenseTime has been in controversies ever since its facial recognition technology was massively deployed in the extensive surveillance and detainment program of the Uyghurs and other ethnic and religious minorities. (Wang, 2020)

Super Camera

According to Global Times, Shanghai-based Fudan University, Changchun Institute of Optics Fine Mechanics and Physics of Chinese Academy of Sciences in Changchun developed

an AI-based cloud camera service called the "Super Camera". This "Super Camera" has a resolution of 500-megapixel which is five times more detailed than the 120 million pixel resolution of the human eye. This camera is able to instantly recognize every single human face in a crowd credited to its ability to shoot panoramic photos (Louise, 2019)

How Does Facial Recognition Actually Work?

There is very little information available on what system China uses to compile all the data. (Kshetri, 2020) However, since facial recognition is used heavily in China, we can understand that biometrics are used to map facial features from videos and photos. The geometry of the face is read by facial recognition software. There are key factors that are important while documenting individual faces. Those factors are the distance between the forehead and chin and the distance between the eyes. The software also then identifies facial landmarks. All these features put together give result to a facial signature. This facial signature is essentially a mathematical formula. This mathematical formula then enters a face recognition database of millions of such mathematical formulas. Moving forward, whenever a face is scanned, the mathematical formula of that face is matched with the mathematical formula found in the database and then determination is made if the faceprint matches an image in a facial recognition system. (Kshetri, 2020)

Face recognition systems can make mistakes under challenging conditions of poor lighting, low quality image resolution, and suboptimal angle of view. (Ryan-Mosley, 2021)

When it comes to facial recognition errors, two concepts are key- A false negative and a false positive. A false negative result is when the face recognition database erroneously returns zero

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results when asked a query. A "false positive" is when the face recognition system erroneously matches a person's face to an image in of another person's face in the database. Even though errors should be at a minimum for everyone's safety- it is still better to have false negative results than false positive results. A false positive result can result in misidentification and an innocent person might have to bear the consequences of a crime something he/ she did not commit. (Ryan-Mosley, 2021)

Clearview AI is a controversial facial recognition software that China is known to be using in its Social Credit System. Mr. Ton-That who owns and runs Clearview AI recruited a few engineers who designed a program that could automatically collect people's images from across the internet, such as Facebook, Venmo, educational sites, employment sites, news sites, and other social networks including YouTube, Twitter, and Instagram. Thereafter a perfect facial recognition algorithm was written by those engineers that was derived from academic papers. The result created a system that converts all the images into mathematical formulas, or vectors, based on facial geometry. A vast directory was created by Clearview which clustered all the photos with similar vectors into "neighborhoods." When a photo is uploaded onto Clearview's system, it converts the face into a vector and then shows all the photos stored in that vector's neighborhood, along with the links to the sites from which those images were taken. (Hill, 2020) Clearview AI is now also used by the FBI. Sergeant Ferrara from the FBI said that Clearview's nationwide database of images is much larger than any other facial recognition software and its algorithm doesn't even require photos of people looking straight into the camera. Therefore, as law enforcement agency, they can even use imperfect photos of people like those of people wearing hats, or glasses, or pictures with side profiles. The results are still 99% accurate for Clearview. Clearview AI is under controversy because Facebook, Twitter and other social

networking sites disallow such scrapping of people's personal pictures as it is a breach of privacy but Mr. Ton-That does not seem to care about the same. (Hill, 2020)

Pilot SCS in Rongcheng

Rongcheng, which is a city in the Shandong province has already implemented the Social Credit System and is being operated and handled by the state government. 1000 points are given to each resident of Rongcheng to start with. Depending on their scores, they receive grades between A+++ to D (Mistreanu, 2018)

To be considered a model citizen and to be a part of the "red list" which comprises all the model citizens of China, individuals need to have a score of 1050 and more.

Individuals with a score of 849 are under warning as anything below this score will cause them to suffer from restrictions. (Farrell, 2017). Anything below a 599 adds individuals to a "black list" also making them an 'object of significant surveillance' (Farrell, 2017). Between grading A+++ and D, the individuals when they reach the C grade, they start experiencing imposed restrictions and can have regular visits by government authorities. However, citizens who have managed to dip their grade to a terrifying D end up losing all their creditworthiness and can no longer apply for certain jobs irrespective of how qualified they might be on paper. (Deutschlandfunk, 2017).

Under watchful eyes in Xinjiang

Urumqi, which is the capital of Xinjiang, was one of the first cities to be fully under high-tech social control. In the city, almost all aspects of daily life of the citizens are carefully monitored. The license plates of all the cars, entering and leaving the city are strictly monitored using surveillance cameras and the government is alerted if any out-of-region car is seen in the area. As minute as chat applications and videos that could potentially be politically dissonant are strictly checked. There are police checkpoints all over the city which have high tech machines which scan ID cards, faces and even eyeballs. The cops do not need a reason to arrest Uighurs who potentially drew suspicion. It is a scary thought but what happens in Xinjiang could be the fate of the rest of the Chinese citizens as well. (The Week, 2018).

How the Social Credit System Works.

As discussed previously, the Social Credit System gathers data using phone applications, facial recognition techniques, video surveillance data, etc to formulate a credit report for each individual. Depending on the score that each individual has on the credit report an individual's chinese social credit score is identified. Scores typically range between 350-950.

The Social Credit System also consists of 'blacklist' and 'red list' systems that propagate the mechanism of reward and punishment (Creemers, 2018). If the credit score is high, it allows the individual to benefit from certain perks. However if the score is low, the individual has to perish and face challenges caused by the government. (Creemers, 2018) According to China's government the Social Credit System is a way to produce model citizens. However many studies show that this is just a way to control each and every action of each and every citizen of China,

in order to ensure that all citizens are aligned with the propaganda of the government. (Yin, 2014)

How Scores Can Increase?

The list of good and bad deeds is vague and incomplete. The full scope of actions that could be rewarded has not been well-defined, and could be at the discretion of many different agencies and officials. However, the general "model citizen" behavior would include actions like honestly paying the bills on time, following traffic rules, sharing positive and government praising social media content, limited usage of social media. Even purchasing diapers for your child could potentially increase the credit score as it indicates responsible behavior. Other ways to increase your score are exercising every day, eating healthy nutritious food and avoiding junk food, working overtime, limiting alcohol and cigarette consumption, etc. (Donnelly, 2021)

The Rewards.

Maintaining a high score can reap a multitude of benefits. It allows individuals to book and stay at the best hotels. More job opportunities and job positions open for these people. These people get easier access to loans with a much lower interest rate. They also get priority for school and university admissions. Free gym facilities, shorter wait time at the hospitals, and tax breaks are some of the other benefits they could receive. (Donnelly, 2021)

How Scores Can Decrease?

Gambling, over consumption of alcohol, cheating, dishonesty, missed loan payments, jaywalking, over consumption of junk food, etc. can decrease an individual's credit score.

Guilty by Association can also affect an individual's score. What this means is that if someone is in friendly association with someone who has a low credit score, their own credit score could also decrease just because they chose to be associated with a person with a low score. Also, it is important to be careful who you choose to be your online friends. Even if you're not in contact with them, your score can be affected by what your online friends say and do. If you are connected with someone online and they post anything negative, their score and yours will be dragged down. (The Week, 2018).

Punishments

The punishments could include a decrease in the internet speed, higher loan rates, increased taxes, etc. In some cases even your dog can be taken away from you as a form of punishment. Apart from that, public shaming is common. One can be publicly named as a bad citizen. Public Shaming happens by exposure either online or TV screens in public spaces of the name, photo, and ID number of blacklisted citizens. (Donnelly, 2021)

Some examples to the above mentioned discrimination have been reported in Dengfeng, which is a city in the Henan province. When trying to make a phone call, an audio message greets the individual instead of a ringing tone in order to inform the caller that the person they

are trying to reach is a dishonest and an irresponsible person when trying to call an individual who is on the system's blacklist (Wang, 2017).

LED billboards along with TV screens are used to publicly humiliate and expose blacklisted individuals in the city of Taishan. These billboards display the pictures of the blacklisted individuals along with their ID numbers. (Yu, 2018). A memorandum was signed by over 44 government departments in China to limit and restrict 'discredited' individuals across multiple levels (Yang, 2017). As a punishment for showing dishonest behavior, about 7 million people have been banned from taking flights since 2013. 3 million people have been banned from riding on high-speed trains by the Chinese government (Xu & Xiao, 2018).

Similarities around the World- The United States of America.

There are similarities to the Chinese Social Credit system in the United States. The FICO Credit Score system is a good example. It is public information and gauges an individual's financial management and allows/ disallows purchases based on the same. Moreover, rating mechanisms are present in platforms like Uber, Ebay and Facebook. Number of likes, stars, or ratings are calculated to assess the value of an individual, In the case of these applications (Hearn, 2010).

There is also a concept of "exchange relation" in the United States in which the public voluntarily submits itself to comprehensive monitoring in a progressive fashion in exchange for free, or cheap online services on social media. (Andrejevic, 2007).

Potential Benefits of a Social Credit System

There could be a variety of views on the Social credit system- some positive some negative. However, looking on the brighter side, one benefit of the Social Credit System is that hundreds of millions of Chinese people will be able to easily loan money without having an enormous financial history. (Hornby, 2017)**.** This factor is important because there was no concept of a credit in China until the 1990s (Chorzempa et al, 2018) and when payments became digitized via applications and cell phones, credit cards became less and less popular. Hence, it was always hard to create a credit score per se. (Trading Economics, 2021)

Moreover, organizing a consolidated metric system of creditworthiness works well with globalizing China's economy, developing a good global reputation of Chinese brands, as well as forming new areas of competitive advantage. (Chorzempa et al, 2018)

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