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# ARTIFICIAL INTELLIGENCE IN CHINA: THE DEVELOPMENT OF SOCIAL CREDIT SYSTEM AND ITS USE IN THE "WAR OF PEOPLE" AGAINST COVID-19

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# 前言

2015 年，中国宣布了一项国家战略计划，其目标是在 2049 年底前成为一个占主导地位的全球技术超级大国。从那一刻起，《中国制造 2025》就成为党和国家领导人习近平的一个重要优先事项。

作为 ″十三五 ″和 ″十四五 ″规划的一部分，中国打算改造自己的工业能力，从一个劳动密集型的大国变成一个更加注重技术的大国。换句话说，中国试图摆脱其 ″世界工厂 ″的地位。

为此，它提出了改造中国的三步走战略，符合 ″创新驱动、质量第一、绿色发展、结构优化、以人为本 ″的方针和 ″市场导向、政府引导、立足当前、着眼未来、整体推进、重点突破、自主发展、开放合作 ″的基本原则（刘，2016；李，2017；张，皮克，皮卡斯，&李，2016）。

到 2025 年，第一阶段将从制造大国变为制造强国。到 2035 年，第二阶段将达到全球工业强国的中等水平。第三阶段的目标是巩固中国的制造大国地位，到 2049 年，中国的完整制造实力将位居世界第一。

″中国制造 2025 ″战略将智能制造作为成功的关键领域优先考虑。中国将建立智能工厂和数字化车间，作为促进智能制造的主要领域的新举措；加快先进制造技术和设备在生产链中的应用，如人机智能互动、机器人系统、智能物流管理和制造技术，并促进模拟优化。

凭借其最大的科技公司对研发的推动力，中国是全球人工智能改进的驱动中心之一。对中国来说，到 2049 年成为世界人工智能的领导者的目标也意味着有机会改变国家的声誉，从廉价商品的出口商转变为以开发和销售高质量产品为中心的国家。显然，这是一个长期项目，也需要外部投资者的支持。人工智能在涉及人类福祉的方面具有突出的能力，可以为医疗保健系统、教育系统和安全系统提供相当大的改善，这在大流行病期间得到了证明。但是，鉴于其边界没有明确的定义，相反是相当模糊的，它提出了伦理、法律和证券问题，在最终将人工智能引入我们的日常生活之前，一个准备充分的治理机构应该解决这些问题。

如今，与人工智能在我们生活中的传播和认可有关的讨论最多的话题之一是社会信用体系：该体系通过在传统和大数据基础上计算的分数来衡量每个人和公司的信用度，根据个人或公司在财务、政治和社会方面的行为是否符合政府的一般路线来决定奖励或惩罚的属性。

这种系统在 Covid-19 的传播期间达到了它的势头，事实上，它是用来试图减少病毒传播的管理工具之一。该系统得到了加强，以帮助应对大流行病的努力，并减少在突发事件的情况下其持续运行所带来的伤害风险。大流行病也是对 SCS 的一次压力测试，领导层从中吸取了宝贵的经验教训，以备将来之用。本论文根据中央和地方政府的记录和官方媒体的描述以及学者们在 2019 年至 2021 年期间发表的研究报告，研究了该大流行病对 SCS 的短期和长期影响，以及对大流行病第二阶段的影响。

**ABSTRACT**

*In 2015, China announced a national strategic plan whose goal is to become a dominant global technological superpower by the end of 2049. From that moment onwards, Made in China 2025 has become a major priority for both the Party and the state leader Xi Jinping.*

*As part of the Thirteen and Fourteen Five-Years Plans, China intends to transform its own industrial's capacity, passing from being a labor- intensive powerhouse to a more technology focused powerhouse. In other words, China seeks to leave behind its status as "world's factory".*

*To do so, it proposed a three-step strategy to transform China which is in line with the guideline of "innovation-driven, quality first, green development, structurally optimizes and human-oriented" and the basic principle of "market orientation, government guidance, focus on the present, look into the future, overall promotion, key breakthroughs, independent development, opening and cooperation" (Liu, 2016; Li, 2017; Zhang, Peek, Pikas, & Lee, 2016).*

*By 2025, the first stage will be to pass from being a manufacturing giant to a manufacturing powerhouse. By 2035, the second phase will be to achieve a medium level of global industrial power. The third stage aims to solidify China's position as a manufacturing power, with China's complete manufacturing strength ranked first in the world by 2049.*

*The "Made in China 2025" strategy prioritizes intelligent manufacturing as a key area for success. China will set up intelligent plants and digitalized workshops as new initiatives in major fields to promote smart manufacturing; quicken up the application of advanced manufacturing techniques and equipment to the production chain, such as human-machine intelligent interaction, robotic systems, intelligent logistics management, and manufacturing techniques and also promote simulation optimization.*

*With its greatest tech companies driving force for R&D, China is one of the driving worldwide centers of artificial intelligence improvement. The aim to become the world leader in artificial intelligence by 2049 for China would also mean having the opportunity to change the country's reputation from exporter of cheap goods to one that put at the center the development and sale of high- quality products. Clearly this is a long-term project that also need the support of external investors. Artificial intelligence has the outstanding capabilities for what concerns human welfare to provide considerable*

*improvement in the health care system, in the education system and in the security system and this was proven during the pandemic. But, given the fact that its borders are not clearly defined, on the contrary are quite blurred, it raises ethical, legal and securities issues that a well-prepared governance should address before finalizing the introduction of artificial intelligence in our daily life.*

*One of the most discussed topic nowadays related to the diffusion and acknowledgment of artificial intelligence in china daily life is the one of the Social Credit System: a system that measure the creditworthiness of each individual and company through a score calculated on the basis of traditional and big data, determining the attribution of rewards or punishments depending on whether the individual or company behaves financially, politically and socially correct according to what is the general line followed by the Government.*

*This kind of system reached its momentum during the spread of Covid-19 in fact it was one of the governing tools used in the attempt of reducing the spread of the virus. The system was enhanced to help with pandemic response efforts as well as to reduce the risk of harm from its ongoing operation in the scenario of unexpected events. The pandemic also served as a stress test for the SCS, from which the leadership learned valuable lessons for the future. This thesis examines both the short- and long-term effects of the pandemic on the SCS, as well as the implications for the pandemic's second phase, based on central and local government records and official media accounts as well as researchers published by scholars between 2019 and 2021.*

## INTRODUCTION

When it comes to think about China in the 21 Century, what is quite obvious to our mind is the fact that is run by a single party of which Xi Jinping is the current leader, who wants to stay in the office as long as possible. The question we should ask ourselves is what sort of power the Party wants and how it wants to implement it. (Brown, K., 2016)

Xi Jinping and his generation have underlined many times that the Party existed in its youth was one of revolution and then become one of governance after the victory of the 1946-9 Civil War (Brown, K. *ibid*.).

Xi Jinping pointed out that China's cultural past has shaped the country's future (Zheng, W., 2021) and as a consequence, "misdemeanors and sins in the past, can easily be discounted with the riposte that things have now come good" (Brown, K., *ibid*).

So, the Xi Jinping era, should not be seen as a dramatic break from what happened in the past, on the contrary, it should be seen as an era "where the same issues are being tackled with a different set of political and ideological tools" (Brown, K., Bērziņa-Čerenkova, A., 2018).

The major difference we can see from the past is the fact that the Party's previous culture of violence and coercion are now, on the surface, disappeared. Mao's figure went hand in hand with the images of brutal power and iron discipline, it was a certainty that those who tried to challenge him, inevitably perished.

Things changed rapidly after the fallout of 1989 and the gun became not an easy option. The use of violence as a political tool passes from being the norm to being an exception and today the official discourse is one of peace and harmony. The Party wants to "seek harmony", "replace weapons of war with gifts of jade and silk" and "foster friendship with neighbors"[1]. It's especially in this last point - to foster friendship with neighbors - that the Chinese Communist Party today locates its legitimacy (Brown, K., *ibid*).

[1] The quotes are taken from Speech by H.E. Xi Jinping President of the People's Republic of China At the Körber Foundation, March 28 2014 (https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/t1148640.shtml)

More specifically, it refers to the "reform and opening-up"[2] process started in 1978. From this year onwards, China has always been recollected to the term "miracle" due to its economy rise which has been unprecedent in terms of scale and speed and clearly the Party wants to take as much of the credit as possible (Brown, K., *ibid*).
What has been the key ability of the Party is to exists for power. Besides the differences which have been occurred towards the years, the Party's desire for power has always been a certainty, the only difference is the fact it had to change the way to exercise it.
It is in this organization that Xi leads, to understand him without understanding the Party is quite hard. (Brown, K., *ibid*).

Over the past decades, China has undergone a major transition in leadership structure and governance. This shift has been characterized by a move from an era shaped by powerful strongmen like Mao and Deng to an era of collective leadership where both Jiang Zemin and Hu Jintao were seen as "first among equals" (Li, C., 2012). This change has also implied a major transformation of the Politburo Standing Committee (PSC)[3], as a result, China's political structure and decisions appear to have changed dramatically (Li, C., 2016.

The use of collective leadership as a term can be traced back to the Chinese Communist revolution. However, Deng Xiaoping made the most noteworthy commitments to the improvement of collective leadership both in practice and in theory. He was the first to recollect this term to the role and function of the Politburo Standing Committee. On December 24, 1990 Deng said to the then CCP general secretary

[2] The reform and opening-up or the Chinese economic reform is the program led by Deng Xiaoping started December 18, 1978. After the fallout of Tiananmen Square in 1898 the reform went into stagnation but was taken back during Deng Xiaoping' Southern Tour in 1992. (Wikipedia) Available at:
https://en.wikipedia.org/wiki/Chinese_economic_reform#cite_note-3

[3] The Politburo Standing Committee (PSC), officially the Standing Committee of the Central Political Bureau of the Communist Party of China, is a committee consisting of the top leadership of the Chinese Communist Party (CCP). Historically it has been composed of five to eleven members, and currently has seven members. Its officially mandated purpose is to conduct policy discussions and make decisions on major issues when the Politburo, a larger decision-making body, is not in session.

Jiang Zemin and then premier Li Peng that "the key to China's stability lies in the collective leadership of the Politburo, especially its Standing Committee."[4] (Li, C., *ibid*, 2016).

The definition of collective leadership is given by the Party Congress Communique of 2017 which defined it as follow:

> "a system with a division of responsibilities among individual leaders in an effort to prevent arbitrary decision making by a single top leader"[5].

Therefore, both the Chinese elite and the public have been concentrated on the composition of the PSC. (Li, C., *ibid*, 2016)

This means that the Standing committee of the Politburo makes policy decisions based on consensus and compromise. However, achieving consensus in the Standing Committee of the Politburo it's just the tip of the iceberg. There's a larger set of norms of collective governance which have been described by Wang Chunxi and Red Chan in an article published in 2016 (Oftedal, Siv H., 2017)[6]. These includes:

1. *The collective way of transferring power from one leader to the next:* the choice to choose the next leader is not made by the current leader but is made based on the consensus at the top.
2. *The collective set-up in the party organization:* inside the party responsibilities are divided between individual and collective tasks.
3. *Collective study sessions for and by the leadership*
4. *Collective gathering of information:* the collective leadership principle is characterized by consultation and the documents drafted are the result of years of deliberation.
5. *Policy decisions:* Politburo Standing Committee is the top authority of the CCP. Currently it has seven members and to reach valid policy

[4] Deng Xiaoping*, Deng Xiaoping wenxuan* [Selected works of Deng Xiaoping], vol. 3 (Beijing: Renmin chubanshe, 1993), 365.

[5] Hu Jintao: Yi gaige chuangxin jingshen quanmian tuijin dang de jianshe" [Hu Jintao: Promote comprehensive party building in thespirit of reform and innovation], Xinhua, October 15, 2011 (http://news.sina.com.cn/c/2007-10-15/113314089759.shtml).

[6] Oftedal, Siv H., *China's Collective Leadership at a Crossroads?* Norwegian Institute for Defence Studies, 2017, Available at: www.jstor.org/stable/resrep25801. Accessed 12 Apr. 2021.

decision, it needs majority or consensus amongst these seven members. (Wikipedia)

6. *Internal supervision:* individual is constantly supervised by the collective

This kind of collective leadership has become more and more institutionalized and China's post Mao periods stand out as an example of effective power-sharing (Guerguiev, D., 2018)[7]. However, some analysts believe that this kind of governance has not worked well in the past and has not future because it only leads to political infighting and bureaucratic deadlocks (Li, C., 2016). These problems can be summarized in the Hu-era phenomenon of "policies decided at Zhongnanhai not making out of Zhongnanhai" [8] meaning that heavyweight figures were able to "make CCP leader Hu Jintao a mere figureheaded." (Sing Tao Daily in Li, C., 2016)[9]

After the change of leadership in 2012, there have been adjustments in central leadership dynamics (Martina, M., Lim, B.K, 2016). Soon afterwards, Xi Jinping became a much more visible figure as a representative of the Party (Martina, M., Lim, B.K, *ibid*, 2016) and he has become arguably the most powerful Chinese leader since Chairman Mao (The Guardian, 2016). This rapid concentration of power in Xi Jinping has raised questions about the efficacy and durability of Chinese power sharing institutions, raising the question whether or not "the collective leadership is dead"[10].

Following the 2017 Congress, when CCP has given president Xi Jinping the title of "core" leader the discussion exacerbated (The Guardian, 2016. Giving Xi Jinping the title of "core" leader put him on

[7] Guerguiev Dimitar, *Dictator's Shadow: Chinese Elite Politics Under Xi Jinping,* China Perspective available at: http://journals.openedition.org/chinaperspectives/7569, 2018

[8] Tan Xiongwei, "*Why Do the Policies of the Central Government Sometimes Fail to Make It Out of Zhongnan*hai?" Zhongguo qingnian bao [China Youth Daily], November 17, 2005.

[9] Sing Tao Daily, March 10, 2015

[10] Jeremy Page and Chun Han Wong. "Xi Jinping Is Alone at the Top and Collective Leadership 'Is Dead'," The Wall Street Journal, 25 October 2017, www.wsj.com/articles/chinas- xi-elevated-to-mao-status-1508825969 (accessed on 12 April 2021).

par with past strongman like Mao Zedong and Deng Xiaoping (Martina, M., Lim, B.K, *ibid*, 2016). The communique released by the Party stated that the collective leadership "must always be followed and should not be violated by any organization or individual under any circumstance or for any reason", but all members "closely unite around the central committee with comrade Xi Jinping as the core" (Xinhua, 2016). Giving this title certainly marks a significant strengthening of Xi's position.

It must be noticed that when using the term "core" leader, it's the collectiveness which emphazised rather than the hierarchy. (Oftedal, Siv H., *ibid*, 2017). The leader at the core is the person within the group who has additional obligations, rights and representation but who cannot be named top leader without making an inconsistency in terms with the collective authority concept. "Core" represents a balancing act (Oftedal, Siv H., *ibid*, 2017).

In addition, Xi Jinping represents no exception because Mao, Deng Xiaoping and Jiang Zemin were all core leaders, meaning that they had almost absolute authority. The exception instead could be found in Hu Jintao since the term "core" disappeared from official texts for a decade. In theory, we are just observing a return to past origin (Oftedal, Siv H., *ibid*, 2017).

Although the previous considerations, Xi's rapid consolidation of power is seen as a "return to a more normal political reality in China" meaning that the system of collective leadership is over (He, P., 2015). This belief is due to the effective political moves and policy undertakings of Xi Jinping at his arrival in 2012.

First of all, Xi Jinping was able to manage and conclude the so called "trial of the century" or the Bo Xilai trial (Lai, A., 2013). Bo Xilai was a member of the CCP, he became Party secretary of Chongqing, China's largest city and had the ambition of entering into the country's highest circle of power: Politburo Standing Committee. However, his dreams faded away when he was found guilty of corruption by Chinese court

(BBC, 2013)[11]. This trial represented a big challenge for the Party but Xi and his colleagues were able to handle it wisely. President Xi has frequently vowed to crack down on "tigers and flies" in order to "keep power restricted withing cage of regulations"[12]and certainly, Bo Xilai represented a tough tiger. (Broadhurst,R., Wang, P,. 2013) The charge against Bo Xilai has spread the light over a bigger problem. In fact, this scandal exposed the lifestyles of many others high-ranking party leaders which were found guilty besides corruption, also of drugs, money laundering and even murder.

As a response, Xi intensified the CCP's fight against corruption and launched a massive institutionalized anti-corruption campaign that has nothing but increased the power of leaders at the top of the Party hierarchy. In 2013, the Central Commission for Discipline Inspection along with the Ministry of Supervision[13] handled 172,000 cases of corruption and investigated 182,000 officials. By May 2016, 160 leaders at vice-ministerial and provincial levels were dismissed (Broadhurst,R., Wang, P,. *ibid,* 2013).

In addition, since the beginning, Xi Jinping has also shown a certain expertise on the foreign policy front.

China's foreign policy under Xi has been a success. Xi's "proactive" foreign policy approach (奋发有为, fenfa youwei) represents a remarkable difference from that of his predecessor, Hu Jintao, who was considered to pursue a policy of "inaction" (无为, wuwei). China has numerous financial cards to play with countries of the European Union, and China's impact in Africa and South America has developed phenomenally strong (Li, C., *ibid*, 2016).

[11] BBC, *Bo Xilai found guilty of corruption by Chinese court*, BBC, 2013, available at: https://www.bbc.com/news/world-asia-china-24170726

[12] Ding Lin, 'Xi Jinping vows "power within cage of regulations"', Xinhua, (22 January 2013), available at: http://news.xinhuanet.com/english/china/2013-01/22/c_132120363.htm

[13] The **Central Commission for Discipline Inspection** (**CCDI**) is the highest internal control institution of the Chinese Communist Party (CCP), tasked with enforcing internal rules and regulations and combating corruption and malfeasance in the Party. Since the vast majority of officials at all levels of government are also Communist Party members, the commission is in practice the top anti-corruption body in China.

Another fundamental milestone reached by Xi Jinping was the "military reform" ((军改, jungai) between 2015-2016. Xi was able to reshape the PLA. Xi's ability to impose his will was the result of skills that predecessors lacked of[14].

Finally, Xi was determined to reform China's economy and he keeps showing his willingness.

XI's "Chinese dream" stands for the rejuvenation of the Chinese nation and the opportunity for all Chinese to become a middle-class population. As stated in the Third Plenum of the 18 Central Committee held in November 2013, one of the main goals is to make the private sector the driver sector of the Chinese economy.

Obviously, all these measures implemented by Xi Jinping have helped increasing public confidence. They show how Xi was able to identify threats that could dismantle party's legitimacy and supremacy and more than this, they are a demonstration of his ability to consolidate his power under the Party (Li, C., *ibid*, 2016).

Xi's consolidation of power was also sustained by the many top leadership positions that he has assumed. In fact, in contract to his predecessors, Xi became general secretary of the party and took control over the country's top military post at the same time. Xi chairs the newly established National Security Committee (NSC) and the Central Leading Group for Comprehensively Deepening Reforms (CLGCDF), two crucial decision-making bodies. He also holds top position in different leading groups such as foreign affairs, finance and economy. (Li, C., *ibid*, 2016).

Due to the monopoly of power reached by Xi, analysts have begun to call the current top leadership as "Xi administration" rather than "Xi-Li administration, referring to Li Keqiang. Nonetheless, recognizing the great power that Xi was able to reach is different from talking of a "new Chinese strongman" (Link, P., 2014). Many analysts are still skeptic in claiming that Xi has attained supreme stature because it's still too early to draw conclusions.

[14] Andrew S. Erickson, *Sweeping Change in China's Military: Xi's PLA Restructuring*, Wall Street Journal, September 2, 2015.

Xi Jinping Thought: Realisation of the Chinese Dream

What's for sure is that Xi Jinping was able to reach many milestones that could guarantee him a position of privilege. The most noteworthy one is without any doubt the fact that the National People's Congress in 2018 amended the Constitution to remove presidential term limits meaning that President Xi can rule indefinitely. This change in term limits aligns with other posts that Xi holds, as both head of the Communist party and Military, neither of which have terms limits. (Wu, A., Buckley C., 2018).

In 2017, The 18th Party Congress also officially incorporated "Xi Jinping thought on Socialism with Chinese Characteristics for a New Era (Xi Jinping xin shidai zhongguo tese shehui zhuyi sixiang 习近平新时代中国特色社会主义思想) into the CCP constitution.

Xi Jinping thought is based on Four-Pronged Comprehensive Strategy (si ge quanmian zhanlüe buju 四个全面战略布局) which is a list of goals for China, more precisely: 1. To build a moderately prosperous society, 2. Deeping reform, 3. Governing the nation according to law and 4. Tightening party discipline. Among other things, these 4 strategies call for a more prosperous China (BBC news, 2015) and they represent a key strategy because in this way the CCP is, once more, at the center of every aspect of economic decisions, law and governance giving less and less space for dissent voices (Garrick J., Bennet C,Y,. 2018).

1. Prong one: Building a "moderately prosperous society"

Xi highlights the need to "invigorate China" through the coordination of economic, political, cultural, social and ecological strategies. Building a moderately prosperous society requires China to move a socialist market economy characterized by "innovation-driven development, rural vitalization, coordinated regional and sustainable development and the military-civilian integration strategy"

(Garrick,J.,Chang Bennett,Y., 2018). The challenge to face regards the transition from a position advancing solid financial development no matter the costs, to one that advances sustainable development. Chinese macroeconomist Qiyuan Xu says that basic changes in demand and supply issues are necessary for sustainable improvement. On the demand side, "China needs to reduce its reliance on the two old engines of growth—investment and export—by stimulating domestic consumption." (Garrick,J.,Chang Bennett,Y., 2018). Key changes incorporate building a developed social credit system and diminishing exchange costs within the household advertise.

Thomas Piketty warned that China's economic growth is highly unequal. The "new normal" is one considered to be economically unequal and unfair (and thus potentially unsustainable): this inequality is shown in the difference between the wealth of the advantaged few princelings and wealthy second-generation elites (fuerdai 富二代) against those whose income has barely increased at all.

This raises two main issues to be addressed: income and wealth inequality. Knight makes the point that "income inequality is now falling whereas wealth inequality keeps raising". This disparity shows that the "new normal" narrative covers up the development of an imbalanced capitalist class system. (Garrick J., Bennet C,Y,. *ibid*, 2018). Nonetheless China's leaders are aware of this situation and Xi Jinpin's 2018 New Year speech spoke of poverty alleviation:

> "We are now one big step closer to the completion of a moderately prosperous society in all respects (...). It is our solemn commitment to lift all rural residents living below the current poverty line out of poverty by 2020. [15]"(Xi Jinping, 2018)

For Xi, "the principal contradiction facing Chinese society has evolved...and is now the contradiction between unbalanced and

[15] "Chinese President Xi Jinping Delivers 2018 New Year Speech," http://www.china.org.cn/china/ 2017-12/31/content_50181054.htm

inadequate development and the people's ever-growing needs for a better life." (C. McCahill Jr., W., 2017).

This drive for sustainable development cannot be easily seen into a particular paradigm, this because of the "property paradox": a socialist market economy developed within a state-controlled system in which all the land is government-owned.

The four-comprehensive strategy aims to address these kinds of issues, but it must face deeply rooted political obstacles (Zang, X, 2016).

2. Prong two: Deepening Reform

In his report, Xi is aware of the various challenges that deepening reforms implies, like the creation of a modern finance system and the relationship between central and local governments with a clear division of authority and responsibility, taxation reform and financial sector reform.

In the "Explanation of the Chinese Communist Party Central Committee Decision on Several Major Questions About Deepening Reform"[16] (hereby referred to as "Decision") he has made clear that "ideological unity continues to be forged around Deng Xiaoping's 'two-hands' formula: a market-based economy and uncompromising political control."[17]

In the Decision, Xi stated that the rule of law should goes hand in hand with the CCP leadership, in line with Socialism with Chinese characteristics and with economic reform at the center of deeping reform.

From an international point of view, until China's own development strategy won't undergone a significant change, global financial structures will face significant challenges.

[16] Available at: http://www.china.org.cn/china/third_plenary_session/2014-01/16/content_31212602.htm

[17] Third Plenary Session of 18th Central Committee of the Communist Party of China, 中共中央关 于全面深化改革若干重大问题的决定 (zhonggong zhongyang guanyu quanmian shenhua gaige ruogan zhongda wenti de jueding, Decision of the Chinese Communist Party Central Com- mittee on Several Major Questions About Deepening Reform), 12 November 2013, http://www.gov.cn/jrzg/2013-11/15/content_2528179.htm

China's banks pay interest far below international standards and China still have few alternatives for domestic investment vehicles.

The journey from a command economy towards a liberalized economy is still far. If the market remains subjected to the Party- State it become more and more difficult to have an economic development.

3. Prong three: Governing the nation according to law

All legal amendments are built on a socialist rule of law with Chinese characteristics under Xi's leadership. In short, socialist rule of law can be seen as an instrument to be enforced under CPP. Xi urges further "reform of the judicial system and strengthened rule of law awareness among all our people while also enhancing their moral integrity"[18]. Xi has also remarked the need of both rule of virtue and rule of law where the two are complementary.

Nonetheless, Q. Zhang (2016) underlines the general skepticism about the judicial reform to really take place. The legal system is under the control of the Party and this means that it can do very little without a CCP sanctions. [19]

Prong three of the Four Comprehensives fortifies the Party's driving part in judicial reform, but it is hazy whether Party authority can be accommodated with the concept of "rule of law" as resting upon the guideline that law is unbiasedly connected to all individuals and public institutions.

Although the legal system may be a valuable device to discipline the lower levels of the bureaucracy, guarantee the usage of financial arrangement, and ensure rights, the Party is the ultimate referee of principal political questions.

4. Prong four: Tightening Party Discipline

[18] Xi Jinping, Secure a decisive victory in building a moderately prosperous society in all respects and strive for the greatest success of socialism with Chinese characteristics, op cit., 19 available at: http://www.xinhuanet.com/english/download/Xi_Jinping%27s_report_at_19th_CPC_National_Congress.pdf

[19] Zhng, Q, Judicial Reform in China: An Overview, In John Garrick and Yan Chang Bennett (eds.), China's Socialist Rule of Law Re- forms under Xi Jinping. London: Routledge. 17-29.

Xi Jinping in his full report identifies "sweeping efforts to strengthen Party leadership and Party building (...) [and a] commitment to examining ourselves in the mirror, tidying our attire, taking a bath, and treating our ailments"[20].

On the sixth Plenum two major documents on strengthening Party discipline were approved: "Guidelines on Inner-Party Life in the New Situation" and "Party Regulations on Inner-Party Supervision."

The mechanism to ensure political unity are "study session" and "democratic life meeting" which main focus is on Party ideology.

These gatherings are basically "self-criticisms" implied to guarantee the solidarity and virtue of the Party and to eradicate the "four (terrible) work styles"—formalism, bureaucracy, indulgence, and luxury.

When reading of "New Situation", this refers to the anti-corruption campaign previously mentioned started in 2013, which has increased the power of the leaders at the top position. This anti-corruption campaign also targets the military sector and emphasizes "the Party's absolute control over the People's Liberation Army (PLA)" (The Economist, 2015). As Fu (2014) claims, corruption is closely related with authenticity, and political pioneers in China have found it expedient to utilize anti-corruption campaigns to evacuate their political enemies and curb within the bureaucracy while enhancing their authenticity within the eyes of the common public. Fu's "Wielding the Sword" argument is that the Party's against- corruption campaign may be a device for the concentration of political control. The particular mobilization of key law reforms has the effect of nullifying the potential for alternative discourses and could be a central weapon within the Comprehensives' fourth prong (Fu, H., 2014).

The fundamental reason of Xi Jinping Thought is to proceed the journey of figuring it out the Chinese Dream. Against a background of China's rising universal emphaticiness and of domestic control progressively vested in Xi Jinping, it is no shock that the country's structure was revised to empower Xi's rule to expand the 10-year limit. In any case,

[20] Xi Jinping, "Secure a decisive victory in building a moderately prosperous society in all respects and strive for the greatest success of socialism with Chinese characteristics," op cit., 6.

close investigation of Xi Jinping Thought uncovers focuses at which the Leninist guardianship of Chinese society has slight edges. The fragile adjusting act of developing market change and socio-economic change happens beneath an authoritarian leadership model. The challenges of maintaining China's financial development whereas keeping up a firm grasp on Chinese society and fortifying Party control over the nation are large. Xi Jinping is aware of some of these frailties, referring to "acute problems caused by unbalanced and inadequate development".[21] in order to see the global ambitions realized, China undertook multiple reforms which include modernize the military, extending the borders far beyond Asia and take comprehensive market reform. Whether China will be able to realize the so-called Chinese dream, it will depend in large part on how well Xi Jinping and the Party will be able to go through such complex reforms and expansion. (Garrick J., Bennet C,Y,.2018).

**Made in China**

In 2015, China announced a national strategic plan whose goal is to become a dominant global technological superpower by the end of 2049. From that moment onwards, Made in China 2025 has become a major priority for both the Party and the state leader Xi Jinping.

As part of the Thirteen and Fourteen Five- Years Plans[22], China intends to transform its own industrial's capacity, passing from being a labor-intensive powerhouse to a more technology focused powerhouse. In other words, China seeks to leave behind its status as "world's factory". To do so, it proposed a three-step strategy to transform China laying on the basic guideline of "innovation- driven, quality first, green development, structurally optimizes and human-oriented" and the basic principle of "market orientation, government guidance, focus on the

[22] The Five-Year Plans (simplified Chinese: 五年计划; traditional Chinese: 五年計劃; pinyin: Wǔnián Jìhuà) are a series of social and economic development initiatives issued since 1953 in the People's Republic of China. (Wikipedia, available at: https://en.wikipedia.org/wiki/Five-year_plans_of_China#Fourteenth_plan_(2021-2025))

present, look into the future, overall promotion, key breakthroughs, independent development, opening and cooperation" (Liu, 2016; Li, 2017; Zhang, Peek, Pikas, & Lee, 2016).

By 2025, the first stage will be to transform from a manufacturing giant to a manufacturing powerhouse. By 2035, the second phase will be to achieve a medium level of global industrial power. The third stage aims to solidify China's position as a manufacturing power, with China's complete manufacturing strength ranked first in the world by 2049.

Following the release of this ambitious project, immediately both private and state companies started to focus strongly on this plan willing to have a part in the construction of the technological foundations of the so called "Chinese Dream".

This ambitious plan however catches the attention of the Western world which reacted negatively. Experts, in fact, believe that China was engaging in unethical business practices in its drive to become the world's technological powerhouse. The main concern from western rivals was that they would be forced out of the Chinese market and suffer strong competition in third markets, meanwhile China would become more competitive not only in sectors of its own domestic market but also in foreign market. (Zenglein M., Holzmann, A., 2019)

At the beginning of MIC25, Chinese leaders were quite shocked by universal criticism and pushback caught them to a great extent by surprise. As a reaction, China simply decided to opt for toning down the references to the strategic plan. Trigger words such as "MIC25" (中国制造 2025 Zhōngguó zhìzào2025) and "self-sufficiency rate" (自主率 Zìzhǔ lǜ), considered an explicit declaration of China's endeavors to replace foreign products and tech with "Made in China" substitutes, were generally dropped from official documents. As a demonstration of this, at the Central Work Economic Conference[23] in the past years

[23] https://www.chinabankingnews.com/2020/12/21/chinas-central-economic-work-conference-outlines-8-key-missions-for-2021/

neither President Xi Jinping nor Premier Li Keqiang made explicit reference to MIC25.

In addition to the external criticism, it became apparent that there were doubts also from the inside, in fact an occurrence in March 2019 shown that the strategy was additionally profoundly challenged internally. Lou Jiwei[24], the previous Minister of Finance (2013 – 2016) and a strong supporter of a more grounded interplay of market powers within the Chinese economy, freely criticized MIC25 for its improbable points and generally wastefulness. He indeed called the activity a waste of taxpayers' money.

Nonetheless the strategic plan always remained a clear objective in the CCP's mind and the run for catching up the Western industrialized countries kept going together with the goal of gain competitive edge in high- tech and the government will adhere to President Xi's declaration in 2018 to turn the country into a world pioneer in science and innovation. (Zenglein M., Holzmann, A., , *ibid*, 2019)

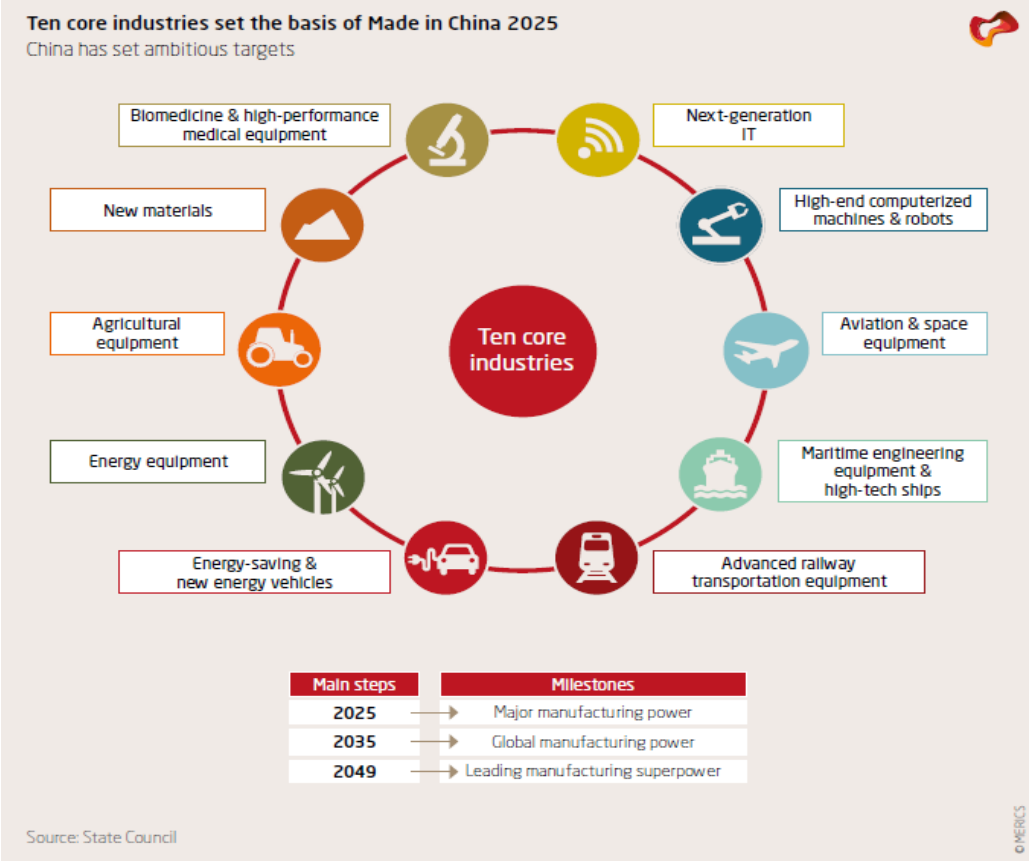
MIC 25 did not blur, on the contrary, it kept gaining more and more attention and it pass from blueprint to effective implementation.

In the last years, China's development has ceaselessly moderated.

In 2018, the economy extended by 6.6 percent, which was the weakest pace since 1990. The nation also risks being caught within the middle-income trap, a phenomenon that numerous developing nations face when rising wages eroded their comparative advantage, making them incapable to compete with the productivity and innovation of advanced economies. For China's authority, there was no other option but to significantly updating its mechanical and financial base. It must keep development levels over 6 percent until 2021 to fulfill its guarantee of thriving and keep up its authenticity.

[24] **Lou Jiwei** (simplified Chinese: 楼继伟; traditional Chinese: 樓繼偉; pinyin: *Lóu Jìwěi*; born December 1950), is a Chinese politician, and current director of the 13th CPPCC Foreign Affairs Committee.[1] Lou was Chairman of China's National Council for Social Security Fund, Minister for Finance, Chairman of China Investment Corporation and Central Huijin Investment, Vice Minister of Finance of China and Vice-Governor of Guizhou. (available at: https://en.wikipedia.org/wiki/Lou_Jiwei)

The only response to help overcome the risk of being caught in a middle-income trap was for the Chinese Communist Party to release the Made in China 2025 strategy.




(Source: Zenglein M., Holzmann, A., Merics, 2019)

The "Made in China 2025" strategy, which revolves around the strategic aim of becoming a manufacturing power, specifies nine tasks as priorities: 1) Increasing the level of manufacturing innovation; 2) Combining information technology with business; 3) Stabilization of the industrial base; 4) Promotion of Chinese brands 5) Making green manufacturing mandatory; 6) Fostering breakthroughs in ten key areas, including new information technology, numerical control tools, and robotics, aerospace equipment, ocean engineering equipment, and high-tech ships, railway equipment, energy-saving and alternative-energy vehicles, power equipment, new materials, biological medicine and medical devices, and agricultural machinery; 7) Supporting manufacturing restructuring; 8) Promoting service-oriented

manufacturing and manufacturing-related service sectors; and 9) Internationalizing manufacturing.

The "Made in China 2025" strategy prioritizes intelligent manufacturing as a key area for success. China will set up intelligent plants and digitalized workshops as new initiatives in major fields to promote smart manufacturing; quicken up the application of advanced manufacturing techniques and equipment to the production chain, such as human-machine intelligent interaction, robotic systems, intelligent logistics management, and manufacturing techniques; and promote simulation optimization. Furthermore, efforts will be made to accelerate the promotion and implementation of the product whole-life cycle management, customer relationship management, and supply chain management systems; improve integration of key links, such as group control and management, development and construction, manufacturing, finance and business; and realize intelligent control and management.

The implementation is expected to set up a strong, national development framework. Supported by an intense mechanical approach that continually keep pushing to move forward capital allocation, arrangement coordination and tech-related development, the point is to move China through the middle-income trap and change the country into a universally competitive manufacturing superpower to a great extent free of foreign technology. But the Chinese Communist Party (CCP) is additionally driven by a more profound political inspiration: it needs to ensure China's financial well-being to legitimize its progressively tight grasp on the nation.

Without any doubts, the decision taken by China to leave behind low-tech and labor-intensive manufacturing which represents an obstacle to the growth of developing countries was a blueprint of what Japan, Singapore, South Korea and Taiwan have already done. (Zenglein M., Holzmann, A., , *ibid*, 2019).

The "East Asian development model"[25] is characterized by industrial decision which are able to combine together business interest, including private as well as state-owned, with national interests. By using this approach, China trusts it can successfully overcome the middle-income trap and diminish its dependence on foreign technology.

But its implementation gained force two years ago in reaction to a slowdown of GDP growth and the ongoing dispute with the United States of America.

The methodology adopted by China is continually being balanced in order to face recently rising challenges. By the end of 2018, the Chinese government had issued a total of 445 official documents specifying execution measures, the body of national arrangement reports advancing MIC25 is colossal.

Local governments proceed to be exceedingly dynamic interpreting Beijing's national vision into neighborhood directives. Experiences within the starting of MIC25 have shown that local authorities compete to demonstrate their commitment to the national campaign. Uncoordinated competition has, within the past, brought about in overcapacities and wasteful assignment of reserves. As a result, the government is pushing for a centrally facilitated but intra-regionally separated usage of MIC25 which points at putting local comparative focal points to best utilize. Setting up advanced industry clusters and national show zones – two best needs the government cited in 2018 for quickened MIC25 implementation – are an essential implies to this conclusion.

The mission of MIC25 shows a completely different approach from past plans. The procedure has penetrated other major campaigns such as Internet+ (互联网+), a State Board activity propelled in 2015 that endeavors for greater connectivity and digitalization in eleven ranges

[25] The **East Asian model** (sometimes known as **state-sponsored capitalism**)[1] is an economic system where the government invests in certain sectors of the economy in order to stimulate the growth of new (or specific) industries in the private sector. It generally refers to the model of development pursued in East Asian economies such as Hong Kong, Macau, Japan, South Korea and Taiwan.[2] It has also been used to classify the contemporary economic system in Mainland China since the Deng Xiaoping's economic reforms during the late 1970s[3] and the current economic system of Vietnam after its Doi Moi policy was implemented in 1986. (Wikipedia, available at: https://en.wikipedia.org/wiki/East_Asian_model)

counting fabricating, and China's artificial intelligence aspirations. All these endeavors create a network of arrangements that do not only look for to accelerating the update of China's whole economy, but also seek to turn the nation into a worldwide fabricating (制造强国), cyber (网络强国) and science and innovation advancement superpower (科技创新强国).

Not at all like past national financial arrangement plans, MIC25 joins much more significance to private business (particularly that of little- and medium-size ventures, SMEs) as well as showcase mechanisms.

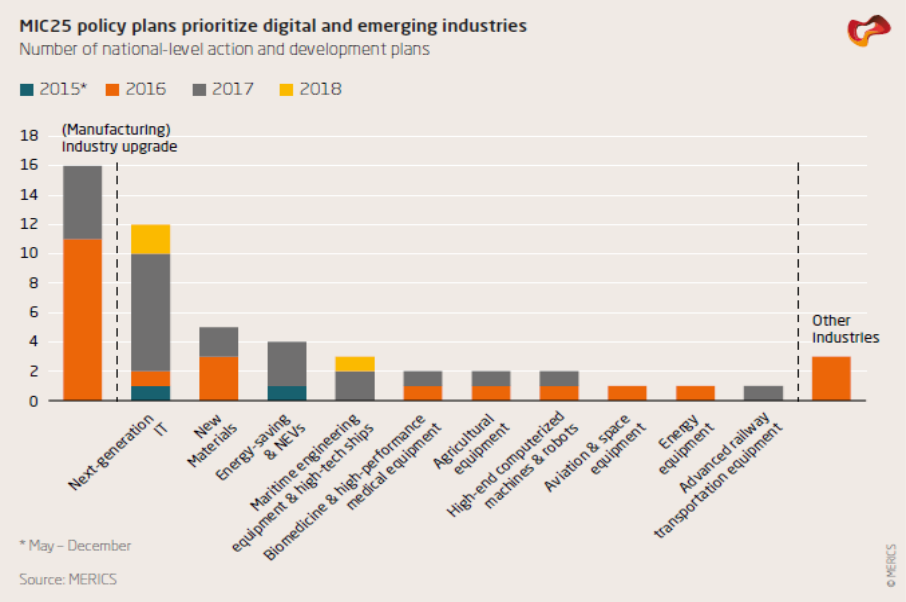
However, the comprehensive and versatile nature of MIC25 makes it quite difficult to evaluate the strategy's proficiency and forecast its success as an entirety. This difficulty is due to the fact that China has engaged targets like industry- or tech-specific creating an overabundance in this plan.

China has as of now manufactured ahead in areas such as 5G systems (next generation IT), highspeed railroads (progressed railroad transportation equipment) and ultra-high voltage electricity transmissions (energy equipment).

Even though China's progress is undeniable, there are still major weaknesses that need to be addressed, just to mention one, the development of advanced semiconductors (Zenglein M., Holzmann, A., *ibid*, 2019).

In addition, as it is quite evident from the image below, China is not focused on the ten core industries of Made in China 2025 in the same way and with the same intensity. China has decided to give priority to those industries related to the country's digital and high-tech ambitions. In fact, smart manufacturing and Artificial Intelligence are the two major priorities addressed by Made in China 2025. These two are the ones which have undergone a rapid development, and which are likely to have an impact in the long period. By now, 530 smart manufacturing industrial parks are born in China and most of them (21 per cent)

focuses on big data. Artificial intelligence instead covers different interconnected fields that goes from hardware to software and applications like the facial recognition.




What makes the difference in the implementation of Made in China 2025 is the fact that China can relate on a strong, sophisticated and technologically advanced domestic market.

There's adequate request and potential competition within the nation, particularly in traditional high-tech segments, including aerospace, machine instruments, or computer program building, to compensate for innovative lacks.

Nonetheless Chinese companies from these sectors still struggle to compete with international rivals and they face the challenge of catching up with foreign competitors.

When it comes to rising advances and digitalization, China wants to overatake foreign competitors. In 2016, the Central Committee of the Chinese Communis Party and the State Chamber mutually issued

"Outline of the National Development Driven Advancement Technique" (国家创新驱动发展战略纲要)[26].

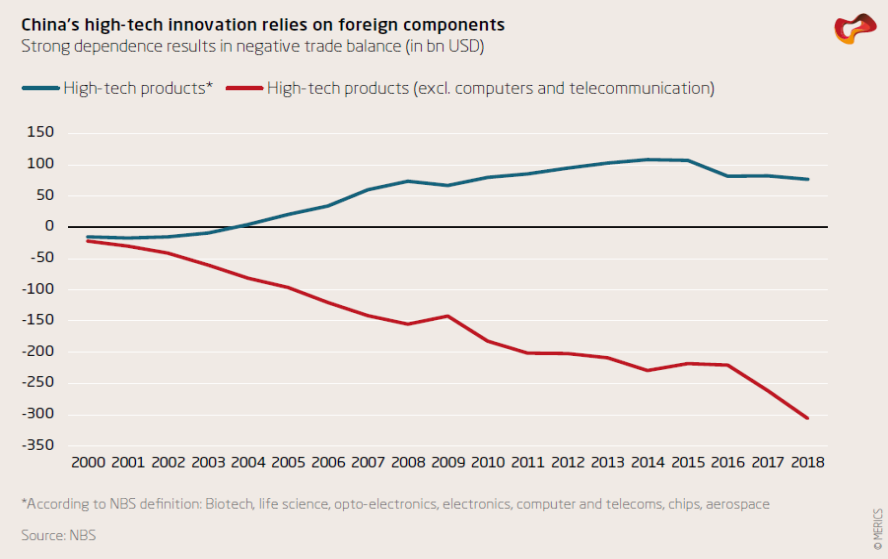
The 18th CPC National Congress proposed executing an innovation-driven development strategy, emphasizing that technological advancement is the key bolster for expanding social efficiency and national strength, and it must be put at the center of the nation's advancement as an entirety. This is a significant national strategy set up by the Central Committee in the new phase of improvement, one focused on major perspectives, which drives the overall improvement. This Outline has been set up in order to speed up the implementation of this strategy. So, the concept outlines the aspiration of getting ahead of other nations.

The gaps in technology in emerging businesses are more liquid, and China consequently sees the unique opportunity to have a driving position right from the begin.

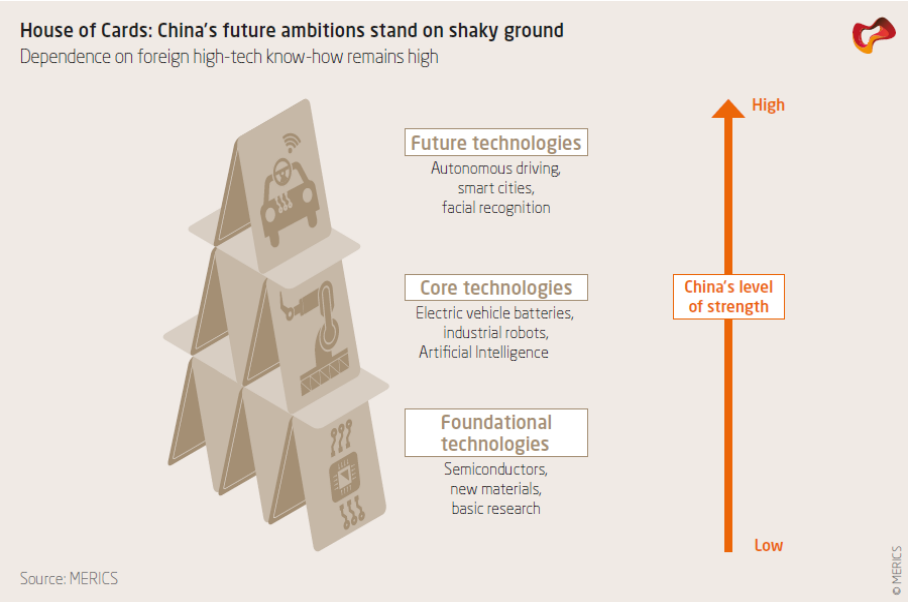
The fact that China can have a leading position in the digitalization advancement is almost a certainty but for the moment, it still has to fight its dependency: the dependency on foreign's countries high tech products. The problem is that the most progressed components and machinery still have to be be imported. The Chinese National Bureau of Statistics[27]' (NBS) stated that China's dependence on outside innovation comes about in a negative exchange balance.

[26] Translation available at: https://cset.georgetown.edu/publication/outline-of-the-national-innovation-driven-development-strategy/

[27] More information available at the following link: http://www.stats.gov.cn/english/




The solution for being completely independent is to master perfectly the innovations which are necessary for empowering innovative advance. This vulnerability is most evident within the areas of new materials, semiconductors and other key components for progressed apparatus and machine tools. Given the fact that this kind of process can't happen suddenly, it also must be noted that China has to overcome obstacles in matching quality, results is the lower level of returns on intangible investments.



Have the access to core components is the key for China's advancement in emerging industries and MIC25 plays a fundamental role in the path of gaining independence from foreign countries especially after Chinese tech firms have seen denied the access to high tech components. Recently, the advancement of the plan to ban approvals for hardware in U.S. broadcast communications systems from Chinese companies deemed national security dangers like Huawei and ZTE has been accepted by the U.S Federal Communication Commission after they voted unanimously. (Zenglein M., Holzmann, A., , *ibid*, 2019).

## CHAPTER 1: CHINA'S INTEREST IN DEVELOPING ARTIFICIAL INTELLIGENCE

Since the 18th Party Congress[28], development has always been put at the center of the country's development plan by Xi Jinping, who particularly keeps stressing the importance of artificial intelligence (AI) development.

Artificial intelligence is believed to be a fundamental milestone to reach for the improvement of the level of intelligence in both the economic and social development and it is considered to be a great solution for the strengthen of public service and city management abilities.

The birth of artificial intelligence is generally considered to be in 1956 when, for the first time, the concept of artificial intelligence was officially proposed.

The aim of this field is to create machines with human-like abilities such as perception, learning, thinking, making decisions, acting, and so on.

After more than 60 years of development, artificial intelligence has reached significant milestones and is now widely recognized and used in the economy and community. This set off a chain reaction that resulted in a new round of technological transformations and milestones, pushing humanity into the Intelligence Era.

Global artificial intelligence implementation plans have already been developed by the United States, Japan, Germany, the United Kingdom, France, Russia, and other nations.

For what regards China, The New Generation Artificial Intelligence Development Plan (AIDP) was released by China's State Council in July 2017.[29]

[28] The full test available at: http://www.china.org.cn/china/18th_cpc_congress/2012-11/16/content_27138030.htm

[29] The China State Council's AIDP is available in English at Graham Webster, Rogier Creemers, Paul Triolo, and Elsa Kania (translators), "Full Translation: China's 'New Generation Artificial Intelligence Development Plan,'" New America, August 1, 2017. https://www.newamerica.org/cybersecurity-initiative/digichina/blog/full-translation-chinas-new- generation-artificial-intelligence-development-plan-2017/.

The National Development and Reform Commission[30], the Ministry of Industry and Information Technology[31], the Ministry of Science and Technology[32], the Ministry of Education[33], and other relevant national ministries and commissions, as well as the governments of Beijing, Shanghai, Guangdong, Jiangsu, and other cities, have all issued relevant policy documents to encourage artificial intelligence development.

China's pursuit of AI has been considered as both a wake-up call for China's increasing technological power and as a precursor for using AI in surveillance and military domains.

The key document (AIDP) issued by the State Council laid out key benchmarks for China's AI industry and renewed the message that AI is a major priority, and it emphasizes the areas where government could cultivate an environment suitable for technical progresses and advances.

[30] The National Development and Reform Commission (NDRC) is in charge of China's macroeconomic planning. It is responsible for formulating and implementing strategies for national economic and social development and coordinating major economic operations. The NDRC submits a plan for national economic and social development to the National People's Congress each year on behalf of the State Council. It also oversees the National Energy Administration and State Grain and Reserves Administration. (link available at: https://www.uschina.org/policy/national-development-and-reform-commission)

[31] The Ministry of Industry and Information Technology of the People's Republic of China was established in 2008 as a department under the State Council responsible for the administration of China's industrial branches and information industry.

The main responsibilities of the ministry:

-To determine China's industrial planning, policies and standards

-To monitor the daily operation of industrial branches

-To promote the development of major technological equipment and innovation concerning the communication sector

-To guide the construction of information system

-To safeguard China's information security.

(Available at: http://english.www.gov.cn/state_council/2014/08/23/content_281474983035940.htm)

[32] The Ministry of Science and Technology (MOST) of the People's Republic of China, formerly the State Science and Technology Commission, is the central government ministry which coordinates science and technology activities in the country. It succeeded the State Science and Technology Commission in 1998. In 2018, MOST absorbed the functions of the State Administration of Foreign Experts Affairs. (available at: https://en.wikipedia.org/wiki/Ministry_of_Science_and_Technology_(China))

[33] The Ministry of Education (MOE) of the People's Republic of China is the agency of the State Council of the People's Republic of China that regulates all aspects of the educational system in mainland China, including compulsory basic education, vocational education, and tertiary education. The MOE certifies teachers, standardizes curriculum and textbooks, establishes standards, and monitors the entire education system in an effort to "modernize China through education". It is headquartered in Xidan, Xicheng District, Beijing.[2] The MOE stresses technical education over other subjects. (Available at: https://en.wikipedia.org/wiki/Ministry_of_Education_of_the_People%27s_Republic_of_China)

The plan outlines three steps that China would take before becoming the leading country in AI:

1. By 2020, China's AI industry will be "in line" with the foremost progressed nations, with a center AI industry net yield surpassing RMB 150 billion (USD 22.5 billion) and AI-related industry net yield surpassing RMB 1 trillion (USD 150.8 billion).

2. By 2025, China points to reach a "world-leading" level in a few AI areas, with a center AI industry net yield surpassing RMB 400 billion (USD 60.3 billion) and AI-related industry net yield surpassing RMB 5 trillion (USD 754.0 billion)

3. By 2030, China seeks to ended up being the world's "primary" AI development center, with a center AI industry net yield surpassing RMB 1 trillion (USD 150.8 billion) and AI-related net yield surpassing RMB 10 trillion (USD 1.5 trillion).

In a wider sense, these three steps in China's agenda recalls the three key stages of artificial intelligence improvement: (1) catching up to the foremost progressed AI powers, (2) getting to be one of the world pioneers in AI, and (3) accomplishing power in AI development (Ding, 2018). The strategy has at least three other objectives in addition to the ones already mentioned.

First, the plan had a gigantic signaling impact, provoking numerous local governments to distribute their own AI plans and set up AI reserves. Second, the plan prioritized key arrangement levers, particularly the development of specialized measures that could empower Chinese companies to become the world's driving AI backbone (Ding, Triolo, & Sacks, 2018). Third, the plan called for worldwide participation and the foundation of more comprehensive AI controls and moral standards, in spite of the fact that it did not display any concrete recommendations on this.

AI, like all advanced technology, has two sides.

There is a "positive" side and a "negative" side when it comes to measuring AI' s social influence. Those who believed AI to be a positive goal to reach claim that scientific advancements and their developments in the world of artificial intelligence have made significant strides. They hope it will result in the fourth industrial revolution, which will have far-reaching implications in areas such as social, fiscal, and military affairs, among others. They claim it would help humanity in industries such as construction, housing, education, medical care, and utilities, among others. On the other party, many people believed AI to be a major threat to human beings as it can jeopardize the digital, physical and political stability of human civilization.

Despite the two contrasting views, the fact remains that AI over the past 60 years has made 4 main characteristics its own. It has made *new breakthroughs* and it has become the *new high ground* of technological competitiveness for countries all over the world, and the pervasive deployment of AI has brought a host of *new challenges* to human society. Consequently, it has been an attraction worldwide and it has started to be taken very seriously. Even though there are still questions regarding AI's potential innovation, it is generally acknowledged that the AI boom will result in a new social culture, foster economic revolution, and fundamentally alter people's jobs and lifestyle. It would be a technical revolution with far-reaching and long-term implications (Ding, J,. Hickert, C. 2018).

## 1.1 History and development of artificial intelligence

Just to give a historic background, it should be known that in the summer of 1956 different scientists at Dartmouth College (USA) started to discuss “how to use machines to stimulate human intelligence” and consequently the concept of artificial intelligence was born. From that moment on, academic circles have developed different perspectives over the growth of AI.

Nonetheless, generally speaking, the evolution of AI in the last 60 years can be split as following:

1. 1956- early 190s: these were the early stages of growth. Since the principle of AI was first introduced in 1956, it went on to produce dozens of new significant research findings, including computer theorem proofs, a checkers program, and the LISP (LISt Processor)[34] language, among others. This was the first time that AI production reached its pinnacle. Basic principle, data infrastructure, computing systems, and application scenarios are all required for AI development. When these elements are not present, big breakthroughs are impossible to obtain.

2. 1960- early 1970s: the period when development was reevaluated. People's hopes for AI have risen dramatically as a result of early breakthroughs in AI development. People started to take on more difficult challenges and set some improbable research and development targets. But a series of setbacks[35] forced AI creation into a rut.

3. Early 1970s- mid 1980s: the period in which development was applicated. The application was developed between the early 1970s and the mid-1980s. Expert systems first appeared in the 1970s, and they were designed to address problems in particular fields by imitating the expertise of experts. This marked a significant shift in AI research from theoretical to functional applications, as well as a shift from a general reasoning-based approach to the application of advanced expertise.

4. Mid- 1980s- mid 1990s: the period of growth decline. Expert systems' narrow fields of use, lack of common sense, difficulty learning information, simple logic processes, lack of distributed functions, and

[34] LISP, an acronym for list processing, is a programming language that was designed for easy manipulation of data strings. Developed in 1959 by John McCarthy, it is a commonly used language for artificial intelligence (AI) programming. It is one of the oldest programming languages still in relatively wide use. (Wikipedia)

[35] For example, the machines' inability to show that the sum of two continuous functions is a continuous function, machine translation making a farce of itself, and so on.

compatibility problems with pre-existing databases increasingly arose as the number of AI applications grew.

5. 1990s-2010: the period of rapid expansion. The integration of knowledge and data has been accelerating due to the growth of network technologies—particularly Internet technology—and the popularization of Web applications has accelerated AI innovation, therefore boosting the direct implementation of AI technology. In 1997 the IMB Deep blue computer defeated the chess world champion Garry Kasparov.[36]

6. 2011- present: development boom. Through the advancement in computer technology such as big data, cloud computing, the Internet, and the Internet of Things; the widespread use of data-gathering sensors; and developments in computing platforms such as graphics processing units (GPUs), AI technologies are increasingly evolving. This technology has made profound progress by resolving the technical gap between research and software and went from being unusable or difficult to use to being functional in a broad range of applications, such as image processing, voice recognition, information Q&A, human-machine gaming, and autonomous driving. The advancement of AI has reached a new level of explosiveness. (Ding, J,. Hickert, C., *ibid*, 2018).

### 1.2 Current status and impact of AI development

Traditionally, we've used computers' ability to produce more reliable performance (for example, by doing quicker and more complex actions than humans can). Software has been programmed with precise instructions on the functions that must be completed. But AI is a different story and consequently it has a completely different approach.

[36] Deep Blue vs. Garry Kasparov was a series of six-game chess matches between Garry Kasparov, the world chess champion, and Deep Blue, an IBM supercomputer. Kasparov won the first match, which took place in Philadelphia in 1996. Deep Blue won the second, which was held in New York City in 1997. The match in 1997 marked the first time a former world chess champion was defeated by a machine. (Wikipedia)

AI systems scroll through massive "big data" collections for correlations, connections, and ideas, and they do so by using a systematic learning approach. This allows them to respond to new data inputs without having to be reprogrammed directly. Machine learning algorithms have prediction and decision-making features, and deep learning systems on the cutting edge of the technology that are pushing the limits even further.

These computer systems have the ability to read, explore, and apply rules of their own. (Barton, D., Woetzel J., Seong J., Tian Q., 2017).

From a technology perspective, AI breakthroughs are focused on specialized intelligence, while general intelligence production is still in its early life: in fact, though recent breakthroughs in deep learning have created AI systems that can equal or exceed human intelligence in certain main functions, "general AI"—machines that can handle the full spectrum of cognitive tasks that humans can—is still decades away.

When we talk of either specialized AI or general AI, we're make references to the applicability of artificial intelligence.

Specialized AI has the characteristic of being oriented towards a single domain: it has a single mission, strict criteria, clear implementation limits, rich domain information and reasonably simple modeling, consequently breakthroughs in the AI sector have arisen. AI can surpass human intelligence. The majority of AI development has been focused in the area of specialized AI, with mathematical learning serving as the theoretical foundation for the implementation of specialized AI. Deep learning, reinforcement learning, and adversarial learning are statistical artificial learning theories that have been widely applied in computer vision, speech recognition, natural language processing, and human-machine strategy. AI algorithms have outperformed humans in large-scale, image recognition and facial recognition, voice recognition systems have a 5.1 percent error rate as high as a trained stenographer, AI systems treat skin cancer at the level of professional physicians, and so on.

Current path indicates that AI technology would soon be adopted internationally in a much broader range of environments and

industries—and one of the more significant implications will be robots performing a multitude of functions that have traditionally been done by humans. An MGI survey examined over 2,000 job practices in 800 professions across the global economy and it appears theoretically possible that 50% of today's job operations could be automated (McKinsey & Company, 2017). However, technological efficiency is just one aspect influencing the rate and scope of automation. Other factors to consider include the expense of designing and implementing specific applications, labor market conditions, economic gains, and legislative and social approval. Taking these variables into consideration, MGI's report on automation concludes that it may take until 2055 for half of all existing job operations to be automated—though this timing is subject to some ambiguity. AI might become an important platform for addressing some of society's most pressing issues in the future. AI would significantly improve our capacity to study the human genome and create customized and more appropriate therapies for each patient in health care. It has the potential to significantly boost attempts to treat cancer, Alzheimer's disease, and other diseases. Artificial intelligence (AI) programs will analyze weather rate and increasing energy quality on a large scale, improving our capacity to control and fight climate change. And the implications aren't limited to Earth; AI systems might one day pave the way for colonization of Mars and the outer limits of space. (Barton, D., Woetzel J., Seong J., Tian Q., *ibid*, 2017).

When we refer to General AI instead it is recognized that it's still in its early phase. The human brain is a general intelligence device that can derive information about other cases from one example, gain mastery through extensive analysis of a topic, and deal with a variety of issues such as vision, listening, judgment, reasoning, studying, dreaming, planning, architecture, and so on. It can be thought of as an all-purpose brain. A completely full artificial intelligence system should be a general intelligence system. While advances in specialized AI, such as image recognition, speech recognition, and autonomous driving, have

been made, technology and deployment of general intelligence systems still has a long road ahead to go, and the overall production level of AI is still in its early stages. The DARPA (U.S Defense Advanced Research Projects Agency) divides AI's development in three stages: rule intelligence, statistical intelligence and autonomous intelligence. DARPA believes AI to be still in the second phase. The foundation of the technology is statistical machine learning, which includes deep learning, reinforcement learning, and adversarial learning. AI systems have made significant progress in intelligence achievement stages such as understanding and learning, but AI systems still have very limited skills in fields such as reasoning and thinking. In general, current AI programs have intellect but wisdom, the have IQ but not emotional quotient. As a result, AI seems to have apparent shortcomings, and there are many "cannots," which is a far cry from human intelligence.

Today, artificial intelligence development is taking off. Global industry has completely recognized the importance of a new round of industrial revolution led by AI technology and has changed their growth strategies one after the other. The world of artificial intelligence is at the forefront of entrepreneurship and innovation.

The world of artificial intelligence is at the forefront of creativity and entrepreneurship. According to McKinsey, global AI research and development spending surpassed $30 billion USD in 2016 and is rapidly growing. According to CB Insights, a world-renowned venture capital consulting firm, 1,100 new AI startups were founded around the world in 2017.

AI has been elevated as an important growth tool for the world's big countries. AI is now the driving force behind a modern wave of economic transformation, which will gradually and deeply impact the trend of multinational market activity and a country's international competitiveness. The world's major developing countries have, one after the other, adopted AI growth as a major policy to boost international productivity and protect national security. They have increased their efforts to develop policies and improve their capital

deployments around key innovations, best expertise, and standards in order to gain supremacy in the current round of global scientific and technological competition.

The social influence of AI is becoming more visible. AI's social influence is diverse: It not only has the positive benefits of boosting the economy, serving people's livelihoods, and helping society, but it can also cause social problems such as a lack of influence over stability, a loss of legal precision, a loss of moral values, a loss of ethical order, loss of privacy, as well as opportunistic conjecture that exploits AI as a hot subject, posing the possibility of bursts.

firstly, AI, as a driving force in the current round of science and technological revolution and economic change, facilitates an exponential jump in social efficiency, accelerates the upgrading of existing manufacturing, and propels the accelerated production of the "unmanned economy". AI has a positive, optimistic effect in the fields of smart transportation, smart housing, smart medical care, and so on. Simultaneously, we should note that the legal and ethical questions raised by AI have grown in prominence, posing unparalleled challenges to the new social order and public management structure. For example, in 2017 Saudi Arabia became the first nation in the world to grand citizenship to a robot. These obviously posed a threat to the standard civil subject scheme. So, should AI systems be eligible to be legal subjects? In this new era of AI, the intellectual property right, privacy protection, discrimination in AI, all require us to provide different solution from different angles and perspectives such and law and regulation, social and ethic management.

## 1.3 The prospects of artificial intelligence

These 60 years of prosperous development has helped AI make breakthroughs in algorithms, computing power and data. This has

extended to the Internet, the Internet of Things[37], and other diverse application possibilities, ushering in a new age of rapid growth. From a technological standpoint, AI is currently at a technical key moment: it is transitioning from "unusable" to "useable," but the path to "useful" still contains constraints such as those related to energy usage, and interpretability. There are still vast rooms for creativity and progress in the field of Artificial Intelligence, from specialized intelligence to general intelligence, from artificial intelligence to the convergence of human and computer intelligence, from human labor+ intelligence to autonomous intelligence.

For sure, the next wave of AI development will have to figure out how to make the leap from specialized AI to general AI. This is also a difficult issue in the research area. The National Artificial Intelligence Research and Development Plan[38], released in October 2016, outlined a short- to long-term growth approach with a focus on general AI research.

For what regards the step from AI to human-machine hybrid intelligence instead, a significant AI research path is to draw lessons from neuroscience and cognitive science research findings, to investigate new intelligent computing models and methods focused on the intrinsic attributes and processes that produce knowledge, and to realize intelligent systems fitted with brain neural knowledge acquisition mechanisms and human-level intelligent behavior. Brain-like wisdom has emerged as a key target in brain plans undertaken by the United States, the European Union, Japan, and other countries and regions. Human-machine hybrid intelligence seeks to incorporate human functions or cognitive models into AI systems, increase AI system functionality, turn AI into a natural extension and enhancement

[37] The Internet of things (IoT) describes the network of physical objects—a.k.a. "things"—that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet. (Wikipedia)

[38] Available at: https://www.nitrd.gov/PUBS/national_ai_rd_strategic_plan.pdf

of human intelligence, and solve complex problems more effectively by human-machine cooperation.

Instead, regarding the passage from “human labor+ intelligence” to autonomous intelligent systems, deep learning is the subject of current AI science, but its weakness is that it necessitates massive quantities of manual intervention: artificially modeling deep neural network models, manually setting application scenarios, manually gathering and tagging a vast amount of training data (very time-consuming and labor-intensive), consumers need manual labor to respond to intelligent systems, etc. As a result, researchers have started to focus on autonomous intelligent approaches that need less human interaction, as well as improving machine intelligence's capacity to engage in self-learning about the environment.

AI will speed up cross-diffusion with other disciplines. AI is a wide frontier discipline and a strongly interdisciplinary composite field in and of itself. The scale of the study is broad and highly complex. Its advancement requires close collaboration with disciplines such as computer science, mathematics, cognitive science, neuroscience, and social science. Along with advances in super-resolution optical imaging and other developments, the advancement in brain and cognitive sciences has ushered in a new age capable of large-scale and more detailed study of the neural network foundations and pathways of knowledge. AI will undergo an intelligent era of biological enlightenment, drawing on developments from fields such as genetics, neuroscience, life sciences, and psychology to turn pathways into computable models. Simultaneously, AI will foster the advancement of brain and social sciences, life sciences, and even conventional sciences such as chemistry, mechanics, and materials.

The artificial intelligence industry will thrive. With the continued maturation of AI technologies and increased government and enterprise spending, the cloudization of AI applications will intensify, and the

global AI industry will enter a phase of accelerated growth over the next decade.

According to a study published in September 2016 by consultancy company Accenture, the application of AI technologies will inject new energy into economic development and will raise the existing rate of labor productivity by 40%; 12 developing countries, like United stated, Japan, Britain, Germany etc, will have an estimated annual economic growth rate that can double by 2035. According to a McKinsey report published in 2018, artificial intelligence (AI) will contribute $13 trillion to economic activity by 2030.

AI will drive mankind forward into a well-liked smart society. This would have a transformative effect on production and the economic structure, propelling civilization further into a popularized smart society.

AI is critical to China's economic and social transition and upgrade.

Pushing forward by the need for consumption cases and business implementations, it is important to break through AI bottlenecks in understanding, engagement, and decision-making, as well as to facilitate the adoption and advancement of AI technology through all trades and careers. To achieve a low-cost, high-efficiency, and widely popularized smart society, a range of standard developments in implementation scenarios must be built.

There’s no doubt that the competition in this field will become fiercer than what already is. In the future, the ruler of the world will be whoever leads in artificial intelligence. But it’s important to remember that any high technology has a double side. Along with the extensive growth of AI and the growing spread of its applications, the social influence of AI has become more evident. AI implementations must be relevant, its grip on items must be limited, and its management must be controlled in order to efficiently control negative risks. To ensure the stable and safe growth of AI, as well as the development of AI that benefits people, it is important to conduct a detailed sociological review of the effect of AI on human society, a deep analysis of the potential impacts of AI on

future economic and social development, and the development of laws and regulations to avoid potential risks and ensure the positive effect of AI.

### 1.4 What does Artificial Intelligence mean for China

As already mentioned, today we are witnessing the transformation of artificial intelligence from being a futuristic fantasy to its fully implementation. Computer researchers have accomplished noteworthy breakthroughs in machine learning and deep learning, giving machines cognitive and predictive capabilities.

With its greatest tech companies driving force for R&D, China is one of the driving worldwide centers of AI improvement. Its endless population and assorted industry blend have the potential to create colossal volumes of information and create an enormous market. Wide selection of AI innovations may be significant to China's future economic growth as the nation's population ages, thus making productivity growth a priority.

The aim to become the world leader in AI by 2030 for China would also mean having the opportunity to change the country's reputation from exporter of cheap goods to one that put at the center the development and sale of high- quality products. Clearly reaching the so desired technological superiority is a long-term project that also need the support of external investors, in fact as the publications made as of today demonstrates, China aims to become the backer behind AI technologies in domestic sector while at the same time gain recognition as global leader worldwide.

To promote itself as AI leader internationally, China considers two ways to follow:

1. First way is to be the forerunner in developing an international AI community, working together with nations, universities and AI talents on a global level also creating new partnership.

2. Second way is for China to become the first exporter of AI technologies worldwide increasing its reputation.

These 2 ways are not mutually exclusive, whether combined or not they will allow China to gain influence and both pathways are a proof of its real determination to become the world AI leader because it does not focus only on internal research and development but also on export opportunities to advance its goals and reposition itself in term of technological leader.

For what concerns the first way, China believes that the faster way to become the world leader is to relate on partners and consortia to "advance together" in the research and development of AI. The partners include governments, universities, academics and so on.

The intention to seek international partnership was announced in 2018 by the Vice Premier Liu He at the World Artificial Intelligence Conference in Shanghai. During that conference, SenseTime[39], one of the most valuable AI Chinese start- up, launched a 15-universities partnership including not only Chinese universities but also Singaporean and American ones (Ping, 2018).

Together with developing partnership, the second way is for China to become the hub of artificial intelligence development. To achieve this goal, China has to continue investing heavily in AI thus becoming the exporter of high- quality products and services. The results of this aim are still unknown but different perspectives have already been discussed : the Artificial Intelligence ana Life in 2030 report gives an optimistic view of the benefits of AI on a global level (Stone et al., 2016) while looking at other perspectives, researches believe that China exports could contribute to the spread of digital authoritarianism (Wright, 2018) while Benaim & Gilman talk of algorithmic authoritarianism. What is a certainty today is that China's ambition

[39] SenseTime (Chinese: 商汤科技) is currently the world's most valuable artificial intelligence (AI) company. The company develops AI technologies including facial recognition, image recognition, object detection, optical character recognition, medical image analysis, video analysis, autonomous driving, and remote sensing for a variety of industries from healthcare to finance, online entertainment to education, retail to security, smart cities to smartphones, and more. (Wikipedia, available at: https://en.wikipedia.org/wiki/SenseTime)

must be examined carefully. Such ambition could go beyond every discussion on algorithms and coding, allowing China to use AI to gain more and more influence, access data and spread an ideology that permits governments to have control over population.

China's emphasis on artificial intelligence exports is a natural result of its investment in this technology and its need to increase demand and maintain high profits to continue reinvesting. Technology export is also necessary to demonstrate, acquire and maintain a leading position in technology, which is one of China's open goals. This approach raises questions about the possible impact of technology exportation on other people and on society, especially since few people see the world like China.

Who and what controls AI from an R&D point of view is certainly not a trivial issue. China's desire to start to lead the pack on AI globally represents a few difficulties for non-authoritarian societies. In particular, it prompts pressures between cultural opportunity and social control. The position of China as an active player win the AI field enables China to shape the arrangements utilized by different societies, which implies the choices it makes during the AI advancement interaction can influence these societies.

There are four area where social opportunity versus control stand apart as essential concerns.

First, one area where China is trying to have full control is developing the standards for AI. As of now, we don’t have standards, parameters or recognized guidelines for AI. As they are still under development, the key players will have the power to shape the standards as they prefer. China can seize the opportunity to create standards and norms to incorporate its ideology and values into technology in a way that affects unwitting consumers.

Second is restricting the flow of information. The concern is whether in exporting AI technology the algorithms will contain biases in favor of the Chinese or censorship used in China will be used worldwide.

Around the world, artificial intelligence researchers now admit that unfairly trained artificial intelligence or unbalanced data sets can create biases in the use of artificial intelligence technology; The problem of data restrictions is not limited to China, but also extends to technology companies. New sources can use conscious and unconscious biases to overemphasize one worldview over another, and limit counterpoints that promote critical thinking and healthy public debate. In AI-enhanced education, the same challenges can be obvious, which can prioritize some perspectives over others, especially in the social sciences and humanities.

Third, countries that have adopted technologies developed by countries on another value have unique risks. In the case of China, the value of the country will be integrated into the development of the algorithm and potentially embedded in the selected training data. To reduce potential unexpected effects, the indigenous AI experts will have to make important revisions of the imported technology. Without such a review, technology may not meet the needs of the country or may introduce errors that are inconsistent with its cultural norms. Therefore, the country that exports such technologies can have the ability to shape the beneficiaries of the technological solution at the level of society. This is not only limited to China but to any countries that by developing algorithms has the potential to put values into technologies that could have influences to end users.

Fourth, another potential area of concern is the one of data privacy. China when dealing with foreign companies requires that company's products and inventions go under review by government. Reviewers can have access to the company's intellectual property so similarly AI partnership will have similar requirements therefore China is likely to have access to a significant amount of datas through exports and partnership.

In general, the implementation of artificial intelligence will have unknown effects and consequences in many social fields.

Chinese method may also cause more socio-economic problems because it may be released too early.

Kai-Fu Lee, chairman of Sinovation Works and former head of Google China, said that China has adopted a "technological utilitarian" approach. "The government is willing to allow this technology to be launched, see how it works, and then contain it. If necessary."(Dai and Shen, 2018). A launch and observation strategy can turn a crowd into a test bed for new technologies without their knowledge or consent.

Although the development of artificial intelligence has begun and will continue to gain momentum, a future driven by artificial intelligence is still the vision of most people in the world. The two paths to leadership, namely outreach/partnership and export model, provide a two-pronged approach to develop artificial intelligence faster and be able to export its technology developed in-house, whether it is fully developed in the country or developed in collaboration in the country.

The potential consequences of China's role and influence in artificial intelligence lead to questions about benefits and consequences. Although these issues apply to other countries and technology companies that are experimenting with artificial intelligence, China's drive to attract investment, its focus on the development of local artificial intelligence, and the desire to become a pioneer in artificial intelligence and related technologies shows its commitment to become an international AI participant. With the realization of China's dream, it has invested heavily in and promoted itself, making it a world leader in technology and artificial intelligence. Regardless of whether the end goal is achieved, China's current dual approach to immersing the world in high-tech artificial intelligence solutions made in China will undoubtedly leave some lasting marks and lingering problems.

(Steckman, L., 2018)[40]

## 1.5 China's position in AI development

[40] Steckman, L., Pathways to lead in artificial intelligence in AI, China, Russia, and the Global Order: Technological, Political, Global, and Creative Perspectives.

Together with the United States, China is as of now the world pioneer in AI advancement.

In 2015 alone, they both accounted for about 10,000 papers on AI distributed in academic journals, while the United Kingdom, India, Germany, and Japan produced almost half as numerous scholarly research articles.

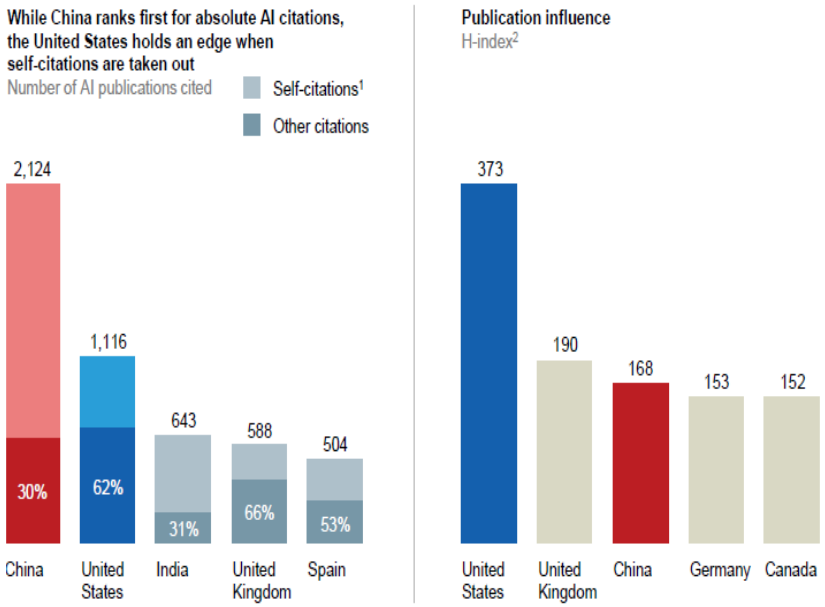
Much of the power behind AI in China is being driven by private-sector tech firms. Helped by huge volumes of search information and their numerous product lines, a few of China's Web giants are on the cutting edge of innovations such facial and voice recognition. These capabilities have been coordinates into modern items, like autonomous cars and automatized assistant.

Thanks to its wide population which can generate a variety of Datas, China has reasons to feel optimistic about artificial intelligence. Datas are the basis for "training" AI systems. Nonetheless keep staying at edge of such a quickly advancing field and maximize the financial potential of these technologies it's not an easy task. China needs to stay updated and continuously bolster its capacity for innovation.

For example, whereas Chinese scholastics have really published indeed more papers on AI than US analysts, their papers have not created the same effect as those by US or UK creators (Exhibit 2).

Exhibit 2

**Although China produces a large number of widely cited AI-related papers, US and UK research remains more influential**

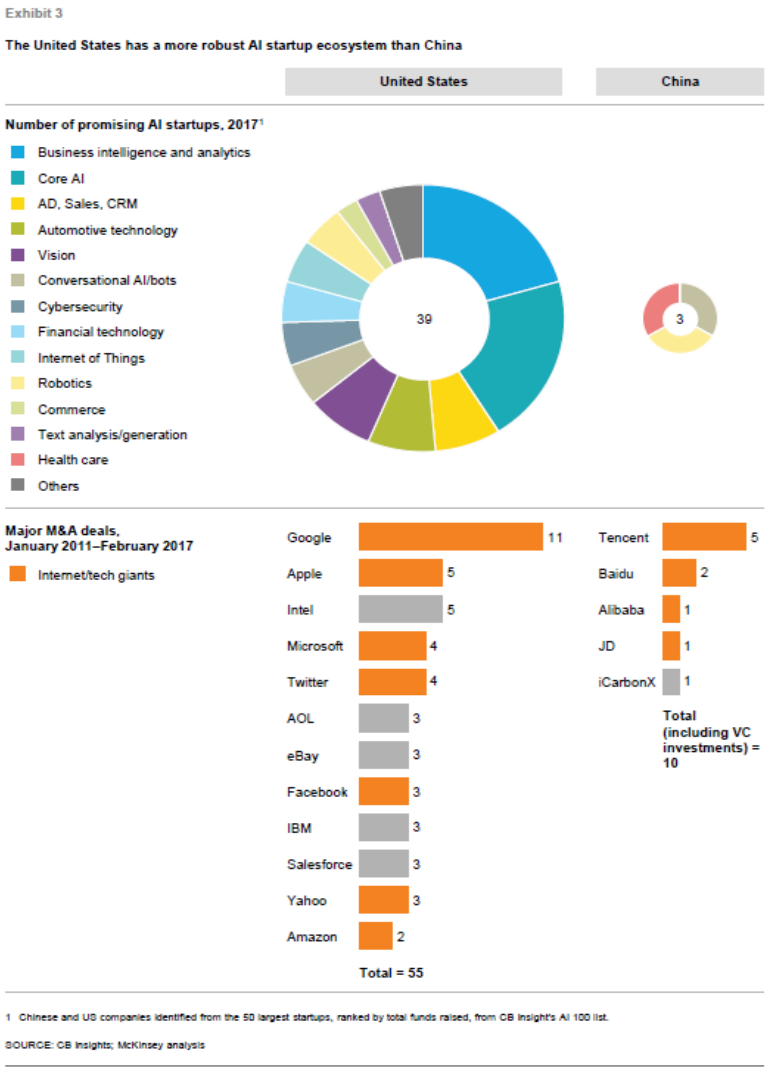



1 Self-citation occurs when a journal cites another article published in the same journal.
2 The H-index ranks both the productivity of scholars and the citation impact of their publications. A higher H-index number indicates more publications that are widely cited.

SOURCE: SCImago Journal Rank 2015; McKinsey Global Institute analysis

Moreover, China does not have the same kind of dynamic AI environment as the United States, which has created significantly more AI startup companies than China (Show 3). The US environment is huge, imaginative, and assorted (counting research universities as well as private companies). Building on all the well-established qualities of the Silicon Valley tech division, it has significant focal points that are not easy to duplicate.

It is helpful to see China's challenge through the lens of the three key building pieces of AI improvement: data, algorithms, and computing control.




- **Data**

Just like a car can't be driven without gasoline, artificial intelligence can't work without data. Data represent the backbone of artificial intelligence because they help artificial intelligence to endlessly redefine itself and its outputs. However, data can also represent an obstacle for China's artificial intelligence development.

First, even though China's giants in the technological field can relate on a huge availability of data thanks to their own platforms, China is still struggling to keep up with United States in creating a data ecosystem with unified standards and a system of data sharing. Second, other countries have found out that using data government can help encourage private sectors innovation, but China can't relate on a huge

public-sector data access. Finally, for what regards a possible global collaboration, China is in a disadvantage position due to limitation on data flows. As Merics states, China ranks 93rd globally for the openness of government data.

Exhibit 4

**China ranks 93rd globally for the openness of government data**

| | Global ranking for data openness, 2015[1] | |
|---|---|---|
| | United States | China |
| Weather forecasts | 13 | 80 |
| Water quality | 15 | 74 |
| National statistics | 1 | 106 |
| Government spending | 8 | 82 |
| Government procurement | 1 | 36 |
| Location (postcodes) | 49 | 61 |
| National maps | 1 | 88 |
| Legislation | 1 | 39 |
| Land ownership | 66 | 85 |
| Pollutant emissions | 1 | 30 |
| Election results | 83 | 87 |
| Company register | 33 | 71 |
| Government budget | 1 | 49 |
| Overall | 8 | 93 |

1 The assessment in each data category considers 10 aspects that contribute to public accessibility. Among these criteria are whether the data is published online and whether it is free, up to date, and machine readable.

SOURCE: Open Knowledge International, 2015; McKinsey Global Institute analysis

- **Algorithms**

For what concerns algorithms development, China keeps the pace with other countries. Chinese players in artificial intelligence have reached breakthrough in developing algorithms, this was possible thanks to open global platforms because from them China could studied and replicate the most advanced algorithms developed so far by other countries. Nonetheless China still lacks fundamental research, being overtaken by United States and United Kingdom. When talking of fundamental research, reference is mostly made to a problem of talent shortage. For China, it's impossible right now to make a push in AI development because its researchers have less than 5 of years of experiences, compared to United States where data scientists boast 10 years and more of experience[41]. Other than this, currently China has less

[41] "Ceiling hit by search model, Baidu uplifts AI strategy with new CEO," 21st Century Business Herald, January 18, 2017, available at http://epaper.21jingji.com/html/2017-01/18/content_54928.htm

than 30 universities lab focused on AI and Chinese scientists are specialized in specific areas such as voice recognition, thus creating a gap in other areas.

- **Computing control**

  Nowadays thanks to the vast availability of microprocessors on the market, computing power can easily be achieved. Nonetheless, China should not underestimate the need to develop its own advanced semiconductor, microprocessor and high-performance technologies. Computing control represents the basic infrastructure of artificial intelligence and master it perfectly is a fundamental requirement for China.

  China has always relied on foreign countries for the supply of semiconductors but in 2015 problems starts to arise when the US government banned the three major chip suppliers worldwide (Intel, Nvidia and AMD) from selling to Chinese government[42]. As a response, China published" Made in China 2025" and the National Guidelines for Development and Promotion of the Integrated Circuit (IC) Industry which was meant to fortify the dynamism and imagination of IC companies and quicken the pace at which China's IC industry catches up with worldwide pioneers. (China Daily, 2014)[43].

  While China makes progress in artificial intelligence, it should always bear in mind that nowadays the technology industry is global and not local anymore. All the aspects of the AI chain work thanks to a global collaboration so China needs to be sure that while going forward with development it creates a system which is open and fully integrated in the global market.

### 1.5.1 Implication from an economic point of view

[42] Khalid Moammer, "US government bans Intel, Nvidia, and AMD from selling high-end chips to the Chinese government," WCCFtech, April 14, 2015, available at: http://wccftech.com/us-government-bans-intel-nvidia-amd-chips-china/.

[43] Xinhua," China announces measures to boost IC industry", Xinhua, available at: http://usa.chinadaily.com.cn/business/2014-06/25/content_17613997.htm

As the population ages, the need to accelerate productivity growth is more and more important and artificial intelligence represents a significant opportunity. However, it should also be considered the potential labor market disruption it could imply.

In the past decades, China has profited incredibly from a "demographic dividend," as its extending labor constrain fueled financial development. But China will lose that force as its population ages. The country's working-age population has as of now peaked and will continue to shrivel within the decades ahead. This means that China would drop well short of the workforce required to maintain financial development at current efficiency levels. The only solution for keeping up with forces would be to strongly booster productivity development.

AI could mediate and represents a partial solution. In fact, it could rely on its ability of either assisting or replacing humans providing a more complete and efficient job activity. For example, Intel[44], which collects chip manufacturing process and mass data used to rely on humans to do root-cause examination in the event that an error appeared. But now machine learning can complete this task much quicker than people, and more than this the real key factor of artificial intelligence is absolutely efficient in predicting errors, identifying obstacles and automating decisions.

What can make easier the advancement of artificial intelligence in China is the fact that a great part of the Chinese economy consists of work that can be easily replaced and automated. According to a research carried out by MGI, the use of artificial intelligence to automate works could results in a boost of productivity that would raise GDP growth from 0.8 to 1.4 percentage. Another positive aspect is that the advancement of artificial intelligence could also create new job opportunities and new types of businesses: just think at all the new positions born after the beginning of Internet era. Unfortunately, this won't bring only positive aspects, in fact if from one side artificial

[44] For more information on Intel, look at: https://www.intel.com/content/www/us/en/homepage.html

intelligence can produce new types of jobs at the same time it will determine the end of many other types of jobs like the ones related to customer service. For example, Alibaba has incorporated a system of customer service in its mobile app that results in an automation of this kind of service.

This will bring a lower request of low-skill workers which will cause a distribution more and more focused on people with "the right skill sets" (McKinsey&Company, 2017). This however does not mean that middle-skill workers are completely safe. In fact, the kind of works which require a high specialization, such as doctors, may also be replaced by artificial intelligence in the next couple of years leading in a strong focus on personal interactions (Khosla,W., 2021)[45].

Datas confirm data China is the country with the highest number of activities that can be technically automate. A report of McKinsey Global Institute showed that 51% circa of job activities in China can be replaced, thus having an impact on more than 350 million of full-time Chinese employees (Mc Kinsey Global Institute, 2015)[46].

The difference between the increasing demand for digital skills and the surplus of low-skill workers could intensify inequalities. An example is the one of women which currently represent only 20 percent of computer sciences graduates and are always categorized in jobs which require routine tasks. (Sina news, 2015)[47].

In the same way, these kinds of inequalities could result more generally in a stronger division between richer coastal regions and undeveloped inland regions.

All these aspects need to be taken into account when planning a future that will have artificial intelligence has a major leader.

### 1.5.2 Implication from a social point of view

[45] Vinod Khosla, "Technology will replace 80% of what doctors do," Fortune, December 4, 2012.
[46] Global growth: Can productivity save the day in an aging world? McKinsey Global Institute, January 2015.
[47] "Top 20 university majors with highest female ratio," Sina News, June 3, 2015, available at http://edu.sina.com.cn/gaokao/2015-06-03/0952471042.shtml

Artificial intelligence has the outstanding capabilities for what concerns human welfare to provide considerable improvement in the health care system, in the education system and in the security system. But, given the fact that its borders are not clearly defined, on the contrary are quite blurred, it raises ethical, legal and securities issues that a well-prepared governance should address before finalizing the introduction of artificial intelligence in our daily life.

We already have proof of the potential of artificial intelligence in addressing social questions. For example, artificial intelligence is used by scientists to forecast environmental changes, at Cornell University in the United States, researchers are using artificial intelligence capabilities to protect certain birds' species (Biba, E., 2016)[48].

The Dutch government is already using it for health care, in fact artificial intelligence is used to identity the most suitable treatments for certain patients.

Artificial intelligence system has also been tested in traffic and public transportation systems showing that AI autonomous cars are likely to reduce traffic injuries and to speed traffic[49].

What all these examples have in common is the fact that they are entirely managed by machines that can make decisions without human guidance. Give such a responsibility to something which is not human is raising ethical and legal questions that need to be answered, considering the huge implications that may derive.

Between the ethical and legal questions raised, some need to be underlined. First of all, in this new AI driven world, companies keep collecting data about individuals, these data also include sensitive ones. This raises doubts about who or what owns personal data. How these data can be protected, where the concept of privacy stands in all of this. Secondly, since the machine learning algorithms are based on data which have features of the real world, this could lead to AI unintentionally discriminating. To give a real example, a top AI company in 2016 decided to experiment the use of a "chatbot" but this

[48] Erin Biba, "Three ways artificial intelligence is helping to save the world," Ensia, April 26, 2016.
[49] "Aliyun AI ET sets to govern the transportation of Hangzhou," Sina News, October 13, 2016.

has result in offending many internet users after the program was settled in online forums.
In addition to these ethical issues, there is also the legal part to take into consideration. If an accident happens due to a AI decision, who will be held responsible? Which legal rights and responsibilities do artificial intelligence developers have?
These and many other questions need to be discussed and it's a main priority the need to find answers which can create a legal and ethical framework which is adequate.

In China, the greatest power of artificial intelligence is to have the ability to completely substitute and change traditional industries. As of today. the government should primarily focus on overcoming initial barriers and consequently the market will growth exponentially.
When talking about initial barriers, reference is made to major strategies that need to be implemented. First, China has to build a solid and robust data ecosystem. As already said, data are necessary for training artificial intelligence systems and accelerating development. To build a solid data ecosystem, China should start by standardizing data sharing and open public data sets. Opening data sets can bring other benefits like improving the quality of public services.
Secondly, China needs to make clear to traditional industries that the need to change the way in which business operates is urgent. According to a Mckinsey research, for more than 40% of Chinese companies, artificial intelligence is not a priority (Manyika,J.,Lund,S.,Bughin,J.,Woetzel,J.,Stamenov,K., andDhingra, D., McKinsey & Company, 2016).
In addition to this lack of urgency from traditional industries, there's also a shortage of know-how in technology fields. Future leaders and business managers will need to have technological skills if they want to stay and survive on the market. the solution to this problem is that China has to strengthen the channel of specialized talent in artificial intelligence and to cover this lack, a possible step is to invest in AI programs establishment and in AI research lab at top universities.

Investing in university research programs has a long-term benefit since know-how is a strong magnet attracting international companies.
Finally, and not less important, to guarantee an adequate implementation of artificial intelligence, China has to raise consensus on ethical and legal issues.
From the internal point of view, consensus will be reached only if processes will be transparent and subject to consultation. Once this is done, government will need to establish a secure body that will monitor AI activities.
From an international point of view, China can be the first nation in creating a governing body that sustain artificial intelligence development and in order to avoid the creation of a permanent obstacle to prosperity due to the increase of the global digital divide, China can share its artificial intelligence expertise with less developed countries.

### 1.5.3 A skeptical look at China' AI development

According to the research carried out by James A. Lewi from the Center for Strategic and International Studies, the Chinese digital authoritarian model in order to be examined fully should be compared to the model of its major competitor, US.
This comparison provides interest points to look at and it makes think whether China's global rise is really unstoppable or not.
James A. Lewis's paper carried out five interesting reasons why Chinese model can result limited: (1) Chinese's governance model is not attractive, this is due to not only Xi Jinping' thought which has very limited soft power, but also because recent Chinese diplomacy resulted in negative reaction from many countries. (2) CCP's domestic legitimacy will limit the model's exportability. The background against which the Chinese model can be exported is the prediction of the future of the model by the history of China's reforms. A key question is whether the party has reached the "sale" date. The Chinese Communist Party (CCP) is part of China's long-term reform line. Its history dates

back to the mid-19th century, but this story did not end in 1949. The CCP's increasingly severe efforts to maintain control overshadow this.

(3) As China will turn to a more statist model, its innovation will likely be slowed compared to the one of US. As China beneathneath Xi returns to a statist model, the beyond decade's impressive progressive that has so inspired others will probably slow. China's fulfillment in technology needs to be assessed carefully, given its uncertain nature. China has made massive strides in earnings for the reason that 1949, and the applications behind "bombs, one satellite" (see "News of the Communist Party of China", 2009; Wangshu, 2015) stay a justifiable supply of pride (and is now an annual award given to main scientists), however it's far nevertheless depending on the West for maximum superior technologies. It has tried for many years to treatment this via way of means of the acquisition, licit and illicit, of western era and via way of means of large funding in China's studies base. It's important to remember that technological advancement itself does not guarantee an increase in national power because it must go together with an effective policy for its use. Moreover, also the debate over China's data advantage is to be discussed. According to Lewis, there's a general misunderstanding in the West: it's not true that China has a data advantage. While it's true that companies like Alibaba and other major Chinese companies can benefit of hundreds of millions of data of Chinese users, this is limited only to China. It is in companies like Facebook, Google and others available on the global market that access to a number of data which are twice the ones available to China in granted.

Where China truly has an advantage is in its privacy regulations. Western firms' access to their bigger data pool may be hampered as a result of these restrictions. Privacy laws in China are expected to be less stringent. Restrictive or poorly enforced privacy regulations in the West, along with data localization initiatives in nations like India, might offer China an advantage in AI development. Biotechnology is the best example of the benefit provided by lax Chinese regulation, since China has made tremendous progress in building its own biotech industry.

(4) Relative military strength influences state power, and while AI will transform how nations participate in conflict, it is uncertain if China will make a greater use than the United State.

AI will change the way countries go to war, but the extent and pace of change will depend not only on the acquisition of new technologies, but above all on the development of doctrines, tactics and operational strategies. Automation of weapons and sensors will improve performance, but the benefit that comes from it depends on whether and how more advanced weapons are used and China in this regard is lagging although the impressive progress made so far.

(5) a State based on governance may be attractive to few governments but not to its citizens – creating not few problems to countries missing China's powerful system of control. China can count of this system of control because the institutions itself encourage and approve this kind of organization. Nonetheless this does not mean that discontent won't increase. On the contrary, the combination of surveillance system together with an increasing nationalism might results in a reduction of China's international influence.

The fact that countries leading in science and technology do higher economically and will do better at workout power and influence, is quite obvious. But, gaining control in science and technology by itself doesn't guarantee power or influence (although it's going to guarantee wealth). Ripped from the larger strategic context, AI can appear powerful and maybe frightening, but the main point the use you make of the technology. Technological advantage combined with inadequate strategy and belief is not any formula for victory, and it's not solely technological innovation that's required but innovation in their application. Rich countries thanks to the combo of technological assets and strategic abilities can turn its leadership in innovation into power however as of today, according to Lewis US still wins over China. (Lewis, J.A, 2018)

# CHAPTER 2: THE IMPLEMENTATION OF SOCIAL CREDIT SYSTEM

## 2.1 The Social Credit system and its function

On June 14, 2014 the Chinese State Council (Guowuyuan 国务院) published a document entitled Planning Outline for the Construction of a Social Credit System which makes official the decision of the State Council to use, starting from 2020, a System that measure the creditworthiness of each individual and company through a score calculated on the basis of traditional and big data, determining the attribution of rewards or punishments depending on whether the individual or company behaves financially, politically and socially correct according to what is the general line followed by the Government.

The Social Credit System consists of two main components: the first concerns the creation of a central repository of information that includes different types of data or financial and non-financial data on the subjects included in this system, provided by both public and private sources. This data collection requires multi-level collaboration to collect and share data (Liang 2018) so local governments must create systems that link data in their respective jurisdictions and government departments must do the same in their areas of expertise in order to create a flow. continuous information. (Chorzempa, Triolo, & Sacks 2018).

The second component is that of the carrot and stick system (Financial Express Online, 2017) to make people and organizations more "sincere". Through the collection of data, the State can evaluate, control and possibly sanction the actions of these subjects through a system of punishments and rewards. It is a project that touches all aspects of daily life and the assessments affect virtually any individual interaction. (Ohlberg, Ahmend & Lang 2017). Even if the fact of using personal data can generate doubts or concerns, the Council of State has conceived the Social Credit System as a necessary tool to regulate

private and commercial conduct, demonstrating that all decisions are based on data, guaranteeing total transparency.
One of the points addressed in the Planning Outline for the Construction of a Social Credit System is precisely the lack of confidence in the integrity of government actions by the population (Chorzempa, Triolo & Sacks 2018). In fact, the document says:

"The social consciousness of sincerity and credit levels tend to be low, and a social atmosphere in which agreements are honored and trust are honestly kept has not yet been shaped, especially grave production safety accidents, food and drug security incidents happen from time to time , commercial swindles, production and sales of counterfeit products, tax evasion, fraudulent financial claims, academic impropriety and other such phenomena cannot be stopped in spite of repeated bans, there is still a certain difference between the extent of sincerity in government affairs and judicial credibility , and the expectations of the popular masses. " (State Council 2014).

So, in the words of Zhou Keda, sociologist at the Academy of Social Sciences in Guanxi, "a thorough credit system is needed for a society to operate well" since dishonesty has long been one of the main problems in China and "it will help improve people 'sense of integrity "(Pumin 2014).

## 2.2 Origins of the Social Credit System

The first talks about the creation of a Social Credit System date back to the 1990s. The radical economic reforms that have taken place in China have meant that banks have gone beyond lending to the state or state organizations. In order to do this, it was necessary to have information about individuals applying for mortgage loans or private entrepreneurs seeking loans for new businesses. Fraud and indebtedness were rampant, because, as in many developing states, the lack of data sharing between lenders made it impossible to know if anyone had already obtained loans from other banks. (Chorzempa, Triolo, & Sacks, 2018). So initially the Social Credit System developed around the concept of

credit intended solely as financial credit with the aim of improving lending activities in the commercial and financial sphere, comparable to other countries such as the United States.

Only since 2014 has China taken a step forward compared to all other countries since the Social Credit System, as defined by the document made public in 2014, conceives the concept of "creditworthiness" no longer as the sole ability to repay debts but by 2020 the State Council intends to create an all-encompassing system to monitor and control the entire society, the goal is to "improve the integrity awareness and creditworthiness" (State Council 2014) of the population and create a company and an economy based on trust. In line with this intent, the Social Credit System focuses not only on information on financial credit (zhengxin 征信) but also on integrity and trust on a moral level (chengxin 诚信). The Planning Outline for the Construction of a Social Credit System also distinguishes four main areas for strengthening integrity: in government affairs, the Social Credit System would increase transparency, improve the administration of law and show government as a model of sincere conduct. In the market economy, social credit would increase efficiency, trust and transparency in multiple sectors, from finance to construction, food and e-commerce. In social services, social credit would increase trust in health care. Finally, the introduction of credit mechanisms would allow courts to implement services more effectively (Creemers 2018 in Liang, Das, Kostyuk & Hussain 2018).

2.3 The actors who contribute to the functioning of the Social Credit System

The Social Credit System is a very complex system that needs the ability of different government organizations and not to coordinate with each other. Nationally, the Government has issued plans for divisions of labor until 2020 covering 20 main areas divided into 84 sub-areas of responsibility, these are important strategic projects that require a high degree of synchronization (Ohlberg, Ahmed & Lang 2017).

The backbone of the National Credit System is the National Credit Information Sharing Platform active since October 2015. This platform collects and shares data from central and local governments. Currently, the platform mostly contains governmental data. It is connected with 42 central agencies, 32 local governments and 50 market players (Xinhua

(Source: Meissner 2018)

This nationwide platform has already stored over 10.7 billion data related to commerce, individuals, and government affairs. In 2007, the Chinese government created the Interministerial Conference on Social Credit System as a coordinating body, under the control of the National Development and Reform Commission[50] and People's Bank of China[51] and increased from 18 to 46 government bodies in 2017 including the Ministry of Finance[52] and the State Administration for Industry and Commerce [53]on the one hand and the Ministry of Public Security[54] and the Central Propaganda Department[55] on the other.

In addition, the Chinese government is introducing the Unified Social Credit Number System to facilitate the exchange of information between the different departments. In the past, different bodies used different number schemes to identify legal entities. These are now gradually being replaced by a unified code of 18 numbers to identify natural and legal persons and to derive all information relating to social credit on them through a single number.

[50] The National Development and Reform Commission (NDRC), formerly the State Planning Commission, was founded in 1952. The main responsibilities of the NDRC are: researching and analyzing the situation of regional economies and urban development, proposing development plans harmonization of regional economies and implementation of the strategy "develop the west" [...] and address issues related to employment, the correct distribution of income, social security and the harmonious development of the economy. (Source: http://en.ndrc.gov.cn/)

[51] It was established on 1st December 1948 after the victory of the Communist Party of China and the creation of the People's Republic of China (PRC). Until 1978, the PBOC was the only institution authorized to carry out financial transactions. Directly controlled by the Ministry of Finance, it coordinates the entire banking system of China, playing both the role of central bank and commercial banking institution. (Source: http://en.ndrc.gov.cn/)

[52] Founded in 1949. The Ministry of Finance of the People's Republic of China is the national executive agency of the central people's government that administers macroeconomic policies and the national annual budget. It also manages fiscal policy, economic regulations, and government spending for the state. (Source: http://english.gov.cn/state_council/2014/09/09/content_281474986284115.htm)

[53] Established in 1953, the State Administration of Industry and Commerce (SAIC) is the authority of the People's Republic of China responsible for advancing legislation concerning the administration of industry and commerce in the People's Republic. level, the responsibilities of the registration and authorization authorities. (Source: http://en.ndrc.gov.cn/)

[54] Formed in 1954, the Ministry of Public Security of the People's Republic of China (MPS) is the main police and security authority of the People's Republic of China and the government ministry that exercises oversight and is ultimately responsible for daily law enforcement. It currently has 1.9 million officers. It is led by the Minister of Public Security (Source: http://en.ndrc.gov.cn/)

[55] The Publicity Department of the Communist Party of China Central Committee, or CCPPD, is an internal division of the Communist Party of China responsible for ideology-related work as well as its information system. It is not formally considered part of the government of the People's Republic of China, but it enforces censorship and media control in the People's Republic of China. It was founded in May 1924 and was suspended during the Cultural Revolution, until it was restored in October 1977. It is an important organ in China's propaganda system, and its internal operations are highly secret (Source: http: // en.ndrc.gov.cn/)

Although the Council of State has disclosed many details on the collection of the data and the respective sharing, how this data is actually used is unclear.

Probably, the Credit System will not generate a single score for individuals and companies but will be assigned different scores, made with different criteria, by several entities. In fact, there are many actors who will contribute to creating the set of data necessary for the Credit System to evaluate, monitor and control the subjects, including Credit China Platform, the National Enterprise Credit Information Publicity System which provides information on the people and companies on the lists as well as positive or negative testimonials from companies and the Credit Reference Center of People's Bank Of China which is one of the main data providers for the National Credit System (Meissner2018).

This image taken from Meissner 2018 refers in particular to the impact that the Social Credit System has on the behavior of market participants, which is why the title in the image "Data flows within China Social Credit System for enterprises". However, as other texts report (Han 2014, Zhang 2016 in Liang 2018) the same data collection mechanism applies to individuals.

In addition to these institutions, private companies are becoming increasingly important in the construction of the Social Credit System, especially in the collection of data. The success of the Credit System largely depends on the willingness of the latter to share their data. Alibaba, one of the largest tech giants in China corresponding to our Amazon, is currently working with the National Development and Reform Commission to create a trade credit system by sharing small business data and blacklists. (CCTV 2016 in Liang 2018). In addition, some internet companies including Alibaba and Tencent [56] have received permission to create their own platforms to assess the credit of

[56] Alibaba is a privately held Chinese multinational based in Hangzhou made up of a number of companies active in the field of electronic commerce, such as online marketplaces, payment and trading platforms, search engines for shopping and services for cloud computing. (Source: https://italian.alibaba.com/)

Tencent Holdings Limited is an investment corporation founded in 1998 by Ma Huateng and Zhang Zhidong, whose subsidiaries provide entertainment, media, internet and mobile phone services in China. (Source: http://www.tencent.com/en-us/index.html)

individuals. We can therefore speak of two interconnected Social Credit ecosystems: the official Social Credit System and other "secondary" credit systems (Liang, Das, Kostyuk & Hussain 2018).

The key to making the credit system efficient and, more specifically, making the use of data efficient is to be able to create a continuous flow of information. One of the biggest challenges this entails is getting different actors to work together to make sure that if a person is in default (or has stood out positively) in one area they will be punished (or rewarded) in another (Ohlberg, Ahmed & Lang 2017).

## 2.4 From dang'an 档案 to big data

The Chinese government has a long tradition of collecting information on citizens, one of the methods used was the dang'an 档案, a dossier created in the era of Mao and still existing, with in-depth information on the individual, the work performance recorded by the units of work and by the local police, renamed credit (Chorzempa, 2018). However, today, with the development of new technologies, the Chinese control system has added more sophisticated methods to the traditional dang'an 档案 including the analysis of big data. (Creemers, 2017). The social credit system becomes an extension of the dang'an 档案 because in addition to individuals, the Social Credit System also wants to monitor and evaluate the behavior of companies.

Unlike dang'an 档案, where information was only accessible to authorized government officials, the Social Credit System wants to make the data public. The government has created two platforms to make information accessible to the public and to allow investigations of blacklisted people or / and companies (hei mingdan 黑名单). The first platform is Credit China (xinyong zhongguo wang 信用 中国 网), a site that offers information on the social credit system and blacklisted individuals, the second is National Enterprise Credit Information Publicity System (zhongguo qiye xinyong sigong shi xitong 中国 企业 信用 思 公示 系统) which is only for companies. Making the data of

individuals and companies public is not only seen as a hassle-free act but is celebrated by the Chinese government. (Ohberg, Ahmed & Lang 2017).

So big data innovation is increasingly at the service of the Government "to track everything about everyone at all times" (Andrejevic & Gates, 2014 in Creemers 2018). This new “collect everything” approach reshapes traditional data collection activities. (Fan, Vishnupriya, Nadiya, and Muzammil 2018). First of all, if previously specific sampling techniques were used, now the whole population is subjected to them (Lyon 2007 in Liang 2018). Furthermore, this new method of “collect everything” is characterized by the fact that it does not have an identified actor, but multiple sources that accumulate data on people. In addition, while conventional data collection techniques were explicit and therefore visible, with contemporary means of collection, data tends to be invisible and exacerbate the power difference between state and citizens. Some of the main problems generated by the use of big data are the opacity of the algorithms used to determine the scores, the inability for users to access the data that companies have about them and more generally the lack of transparency as well as discussions. on privacy, in particular on the fact that the actors who work for the Social Credit System access more data than they actually need for credit levels. (Creemers 2018 in Liang, Das, Kostyuk & Hussain 2018).

### 3.5 What kind of data is collected for the Social Credit System?

The use of data in the Social Credit System is the result of three main phases: data collection, aggregation and analysis.

The data collection, as already mentioned above, includes a set of financial and non-financial data generated by different types of sources. Financial data refers to financial statements, taxes, commercial transactions and loans, while non-financial data refers to different types of personal and social information such as employment, educational qualification and use of social media (Meissner & Wubbeke, 2016; Zhang, 2016 in Liang 2018). This phase also requires solid

collaboration between different actors to generate and share data, including government agencies and private sectors. (Zhang et al., 2015 in Liang 2018).

The National Credit Information Sharing Platform is the backbone of the Social Credit System, it is a national data platform created by the National Development and Reform Commission in 2015. At present, the National Information Sharing Platform has 400 data sets collected from both central and locals. These data sets include both public and private data. Of these 400 data sets, more than half focus on business and commerce, and the remainder group data on individuals or cover social organizations and government affairs. (Liang, Das, Kostyuk & Hussain 2018).

Although the media tend to focus on the social control aspect of the Social Credit System in China, it is clear that the main focus of the Social Credit System is focused on the financial sector and the commercial sector (Clover, 2016).

In addition, two thirds of the data sets collect basic information such as the name and address of the company / individual; these data are used to identify the subjects. On the contrary, a third of the data sets focus on "trustbreaking information" that concerns crimes or behaviors that involve a low credit score. The remaining data sets include information relating to individual and commercial awards and voluntary services.

The data collected by the National Credit Information Sharing Platform are measured on different variables, the National Credit Information Sharing Platform currently uses at least 573 variables to measure commercial enterprises, citizens and organizations. (Liang, Das, Kostyuk & Hussain 2018). Some variables focus on basic information such as telephone number or company name. Other variables highlight rewards and honors, punishments and crimes. This shows that the Social Credit System combines the financial aspect of credit with the social aspect, focusing on the commercial and financial sectors rather than the social sector. However, this does not mean that social control is not a founding element of the entire system but rather that the

combination of commercial activities and social behaviors has further complicated the practice of state surveillance in China. (Liang, 2018).

Of the 42 agencies involved in the Social Credit System, the National and Development Commission provides 72 data sets making it the main actor. The Ministry of Industry and Information Technology is another major agency, sharing 34 data sets, followed by the Ministry of Agriculture (28 data sets), the National Health and Family Planning Commission (27 data sets), the Ministry of Transport (24 data sets). sets). In contrast, the Ministry of Culture (3 data sets) and Securities Regulatory Commission (2) provide a limited number of data sets. This does not make them insignificant actors since as mentioned, the "collect everything" approach is guaranteed by the collaboration of different sources. (Van Dijck, 2014).

Three quarters of the data sets are available to everyone, i.e. they are open to the public. About a fifth of data sets - mostly information on punishments - have limited access, yet it is unclear who actually has excess. Finally, the remaining data sets are shared only between executive bodies. (Liang, Das, Kostyuk & Hussain 2018).

These data sets are data created to have data on citizens, businesses, organizations and government enterprises in China, and the 537 variables have been adopted to identify every aspect of each citizen.

The second phase, or data aggregation, consists in the insertion of financial and non-financial data shared from different sources in a centralized data infrastructure. However, most of the details on this process are still unclear, also because this process is flexible: China, in fact, is building at least 5 central data platforms including National Credit Information Sharing Platform, Credit China, Credit Reference Center, National Enterprise Credit Information Publicity and the List of Dishonest Person Subject to Enforcement. Even if they originated from different entities, the central government demands the exchange of data. (Xinhua 2017). These platforms have different methods or tools for data collection, however the ultimate goal is the construction of a centralized infrastructure that supports the Social Credit System. The People's Bank of China and the National Development and Reform Commission are

the two main players in the infrastructure of the Social Credit System. The National Development and Reform Commission is connected to 39 central agencies, the first partners include the People's Bank of China, the Ministry of Finance and the Ministry of Commerce. In addition, the People's Bank of China has 41 partners and 136 goals such as setting up financial credit investigation systems. (Liang, Das, Kostyuk & Hussain 2018).

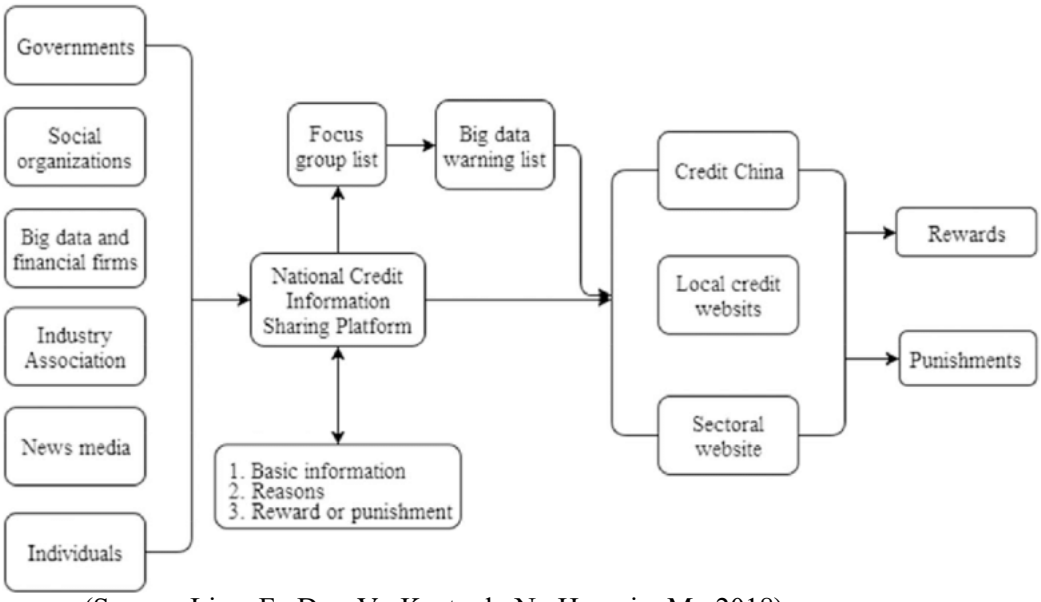
These departments also emphasize the commercial and financial aspect instead of just political and social control, making the Social Credit System not just a system of political control and surveillance, but a complete infrastructure that is improving the capacity of the Government. to oversee all aspects of society. The Chinese government to perfect this system has invested heavily in data sharing, integration and analysis of the latter. Some companies are not only creating their own credit rating platforms but are ready to work with the government to create the centralized data infrastructure. This integration seems to confirm the fact that big data has blurred the boundaries between the state and the private sectors. (Ball & Wood, 2013).

Finally, the third phase concerns data analysis. By 2020, the Chinese government intends to evaluate the credit of citizens and companies and create a system of rewards and punishments. The data analysis process, as well as the aggregation of the latter, appears to be obscure and poorly defined.

## 2.6 System of punishment and rewards

The main program outlined in the 2014 plan is a system of rewards and punishments for sincere or unreliable conduct. The principle behind this system is contained in the phrase "if trust is broken in one place, restrictions are imposed everywhere" (Central Committee and State Council). The program is based on a blacklist system whereby individuals who resist court orders and companies that break laws and regulations in specific areas are unable to perform or have access to

certain activities. The number of offenses involved in blacklisting is steadily increasing as ministries and departments come up with additional regulations for rewards and punishments. (Ohlber, M., Ahmned, S. & Lang, B., 2017). The area where this system was initially used and which continues to be a wide-ranging system is the system of punishments for "untrustworthy persons subject to enforcement" or people who do not comply with legally binding sentences. The origins of this system of punishments date back to the revision of the Civil Litigation Law according to which if individuals fail to fulfill obligations imposed by the courts, the latter are authorized to prohibit defaulters from leaving the country, creating an entry in their credit files and make the names known through the media. (Civil Procedure of the People's Republic of China). The Supreme People's Court in 2013 issued even more detailed regulations that further explain how the punishment and rewards system works by stipulating that anyone who is in default will be blacklisted for a period of two years which in some cases can increase. (Creemers 2018). In 2016, 45 party bodies including the National Development and Reform Commission, the Supreme People's Court and the People's Bank of China concluded a memorandum clarifying their respective roles and stressing the need for collaboration between the various bodies in investigating individuals. or companies that break laws and obligations. Also in that year, the Central Committee General Office and the State Council General Office issued the Punishment System Opinions, a series of opinions that confirms the measures taken and encourages local governments and social organizations to use their own punishment and reward systems. based on the blacklist principle.




(Source: Lian, F., Das, V., Kostyuk, N., Hussain, M., 2018)

According to the official document issued by the Council of State, this mechanism establishes in three steps whether a person (a person or an organization) is on the red list (rewards) or on the blacklist (punishments). First, executive bodies are responsible for redlisting or blacklisting, respectively, while other actors such as the media can offer information on punishments and rewards. In the second phase, 3 types of data are entered in the National Credit Information Sharing Platform and they are: basic information such as names or numbers of identity cards, data concerning the reasons for maintaining the trust or punishing behaviors that break it and the category of final data instead contains rewards and punishments. If a person carries out serious "trust-breaking activities" the National Credit System Information Sharing Platform will share data with Credit China - already mentioned above, it is another national credit data platform. Otherwise, individuals deemed to be potential trust violators who do not yet fall within the blacklist standards are placed on the Focus Group List. If the subject is cited by at least three sources, the National Credit Information Sharing Platform will move him to the Big Data warning list where further investigations are carried out. In the final phase, the National Credit Information Sharing Platform will share the data with Credit China and will only later announce the inclusion in the red or blacklist. (Liang, Das, Kostyuk & Hussain 2018)

## 2.7 China's Social Credit Systems and Public Opinion: Explaining High Levels of Approval (Kostka, G.)

Although there have been recent discussions about the Social Credit System and more and more studies about it, little has been said about how Chinese citizens perceive the Social Credit System.
The research done so far on this aspect is based on a limited amount of data, Genia Kotska's (2018, pp 1-29) analysis, on the other hand, thanks to a rather large dataset, sheds light on the variation in approval of the Social Credit System in China.
The analysis is based on an online survey conducted between February and April 2018 with 2209[57] respondents in China, weighted by age, gender, and region. The survey represents China's Internet-connected population in an age range of 14-65.
The goal of the study, in Kotska's words, is twofold: to document the overall level of citizen approval of different Credit Systems and to identify possible underlying factors driving variations in Credit System approval.

The survey was conducted online via mobile applications and desktops. The survey appeared in online applications or sites and users were offered monetary and non-monetary rewards if they agreed to take the survey. The latter was a "blind opt-in" meaning users did not know the content of the survey before accessing it. The percentage of people who completed it once they started was 64% with a total of 2209 samples.
The questionnaire was divided into six parts with sections on online habits, Social Credit Systems, questions on personal relationships and privacy.
The questionnaire included different types of questions including open-ended questions, multiple choice questions, and rating scale questions.

[57] This is considered to be a good result from the author.

In addition, respondents could select or refer to different pilot programs (e.g., Sesame Credit, see footnote 14) as well as local programs.

Based on the analysis done by Kostka 39% of respondents are female and 61% are male, 55% of respondents are in the 14-30 age range, 42% are in the 31-50 age range, and 3% are in the 50+ age range. 20% of the respondents are from Western China, 35% from Central and 45% from Eastern China.

Most of the respondents (84%) live in urban areas, this is a consequence of the fact that the rate of Internet use is higher in urban areas, moreover the respondents were selected online.

The dependent variable that Kotska was interested in is the approval of the Social Credit System. The question that was asked was "How much do you approve of Social Credit System?", and respondents could answer with one of the following options: 1= strongly disapprove, 2= somewhat disapprove, 3= neither approve nor disapprove, 4= somewhat approve or 5= strongly approve.

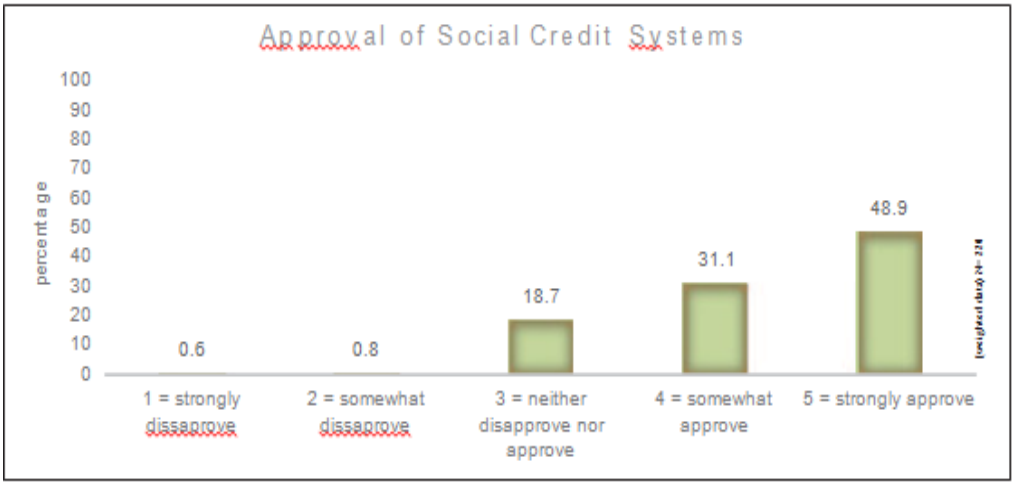
The independent variables, on the other hand, were divided into three categories: individual characteristics and beliefs, characteristics of the Social Credit Systems, and perceived functions of the Social Credit Systems.

The first category included age, gender, net monthly income (divided into three categories 1= less than 1000 RMB, 2= 1000-4000 RMB 3= more than 40000 RMB), education (1=no, 2=low, 3= average, 4= high), online habits both in terms of time spent in front of smartphone (1= I don't have a smartphone, 2= less than 1 hour, 3= 1-2 hours, 4= 3-4 hours, 5= 4-5 hours 6= more than 5 hours) and how often they post online (1=never, 2= les often, 3= a few times per month, 4= at least once per week, 5= at least once per day and 6= many times per day.

The second category collects information about the scores obtained with the Credit Systems which vary from pilot project to pilot project, for example with Sesame Credit users can obtain scores from a minimum of 350 to a maximum of 950 points, about the respondents' awareness of how their scores are calculated (1= I don't understand how is calculated, 2= I know a little about it, 3= I know a lot about it), the

level of information respondents have about the Social Credit Systems (0= I haven't received any information, 1= I have received information), and whether respondents voluntarily joined the System or were automatically included.

Finally, the last category is on the perceived functions of the Social Credit System. Respondents were asked what they believe the function of the Social Credit System could be and whether they believe it could be a useful tool to make individuals and businesses more honest Interviewees were to respond via open-ended responses.)



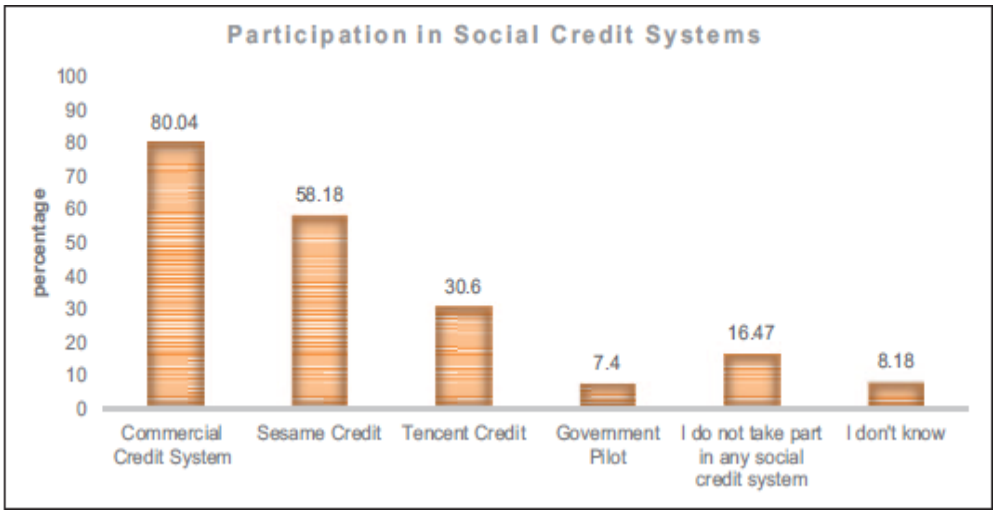




Figure 1. Use of different Social Credit Systems (Source: Kotska 2018

Figure 2. Approval of Social Credit Systems (Source: Kotska 2018)

| | Total | Users of Sesame Credit | Users of Tencent Credit | Users of commercial SCSs | Users of commercial SCSs without using governmental pilots | Citizens part of governmental pilot | Citizens part of governmental pilot without using commercial pilots |
|---|---|---|---|---|---|---|---|
| | N=2209 | n=1309 | n=680 | n=1639 | n=1510 | n=160 | n=31 |
| 1=strongly disapprove | 0.60% | 0.09% | 0.15% | 0.14% | 0.15% | 0.00% | 0.00% |
| 2=somewhat disapprove | 0.75% | 0.38% | 0.08% | 0.37% | 0.40% | 0.00% | 0.00% |
| 3=neither approve nor disapprove | 18.65% | 10.61% | 10.85% | 12.63% | 13.43% | 9.73% | 34.36% |
| 4=somewhat approve | 31.11% | 31.86% | 30.31% | 32.22% | 32.55% | 26.20% | 17.37% |
| 5=strongly approve | 48.89% | 57.06% | 58. 61% | 54.65% | 53.48% | 64.07% | 48.27% |

Figure 3. Comparison of Credit System approval among different groups
Source: Kostka (2018)

Figure 3 summarizes the variation in approval among different groups among total respondents. Approval of the Social Credit System is higher among respondents who are part of a government-run System (64%) than among those who are included in a Commercial Credit System (55%). This difference could be justified by the fact that, as previous studies have shown (Wang and Yu 2015; Ohlberg et al. 2017 in Kotska 2018), the type of institution that processes personal data is important to citizens, who show more trust in central or local executive bodies rather than commercial ones. This fact is reflected in Ohlbeg et al.'s (2017) study of consumer opinions on government and commercial Social Credit Systems which show that criticism in the media debate revolves around commercial companies accessing too much personal data, while no similar accusations are made against the government.

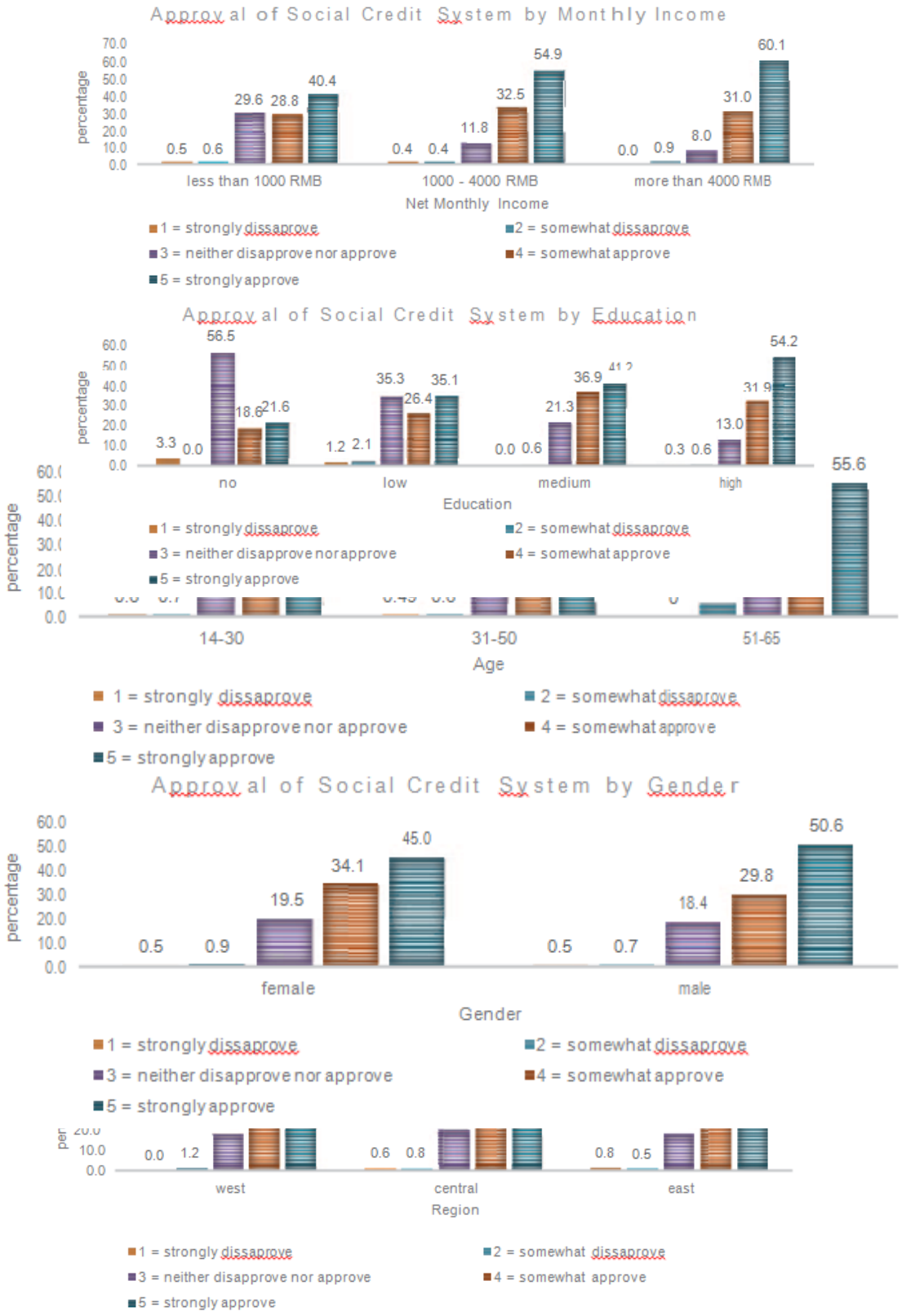



Figure 4. Credit System approval by age, gender, education, location, and region. (Source Kostka 2018)

Approval levels appear to depend on age, gender, income, education, and region. The group in the 51-65 age range is the most supportive of the Social Credit System. Approval of the Social Credit System is also higher among those who report having a higher income, among those who have received a more comprehensive education, and finally it is higher among urban dwellers (82%) than among rural dwellers (68%). Some of these results are surprising because as a study by Pan and Xu (2018) suggests in theory, educated young people, residing in urban areas, tend to have more liberal views and thus are expected to be more skeptical of the creation of the Credit System. Based on the results obtained from Kotska's analysis, however, even though young people tend to be less favorable toward the Credit System than adults, in general wealthier and more highly educated people are more favorable toward the use of the Credit System.

For the fact that people living in rural areas are less supportive of the Social Credit System, there are several reasons. One could be that people living in rural areas are less informed about the Credit System and therefore more skeptical. In fact, about 43% of respondents in rural areas said they did not know how their score is calculated, as opposed to 36% of people living in urban areas. Another reason could be that respondents living in rural areas do not have access to the same benefits provided by the Credit System as those living in urban areas, e.g., economy sharing services or travel-related incentives may be of less interest to rural residents. In addition, 29% of rural residents reported experiencing problems as a result of participating in the Credit System, e.g., 5% of rural residents reported having trouble getting credit due to low scores, while only 2% of those living in urban areas confirmed this. From the perspective of the characteristics of the Credit System, the results show that respondents' credit scores are not a significant factor in approval, what matters is whether respondents feel they have a slightly higher score than their family or friends. In addition, the perception of the fairness of the credit score plays a very important role, several times in the survey reference was made to this aspect of the Credit System. One respondent wrote that " personal difficulties, debt

accumulation because of sickness, and other family reasons can result in a low social credit score, and one should not judge someone based on their low score, it is simply unfair " (Interview 8, June 2018 in Kostka 2018, pp 21-22). Yet another wrote that the Credit System might not apply to people in powerful positions of responsibility [which] might escape punishments, which is unfair (Interview 10, July 2018 in Kostka 2018, pp 23).

Finally , in reference to the functions perceived by the population about the Social Credit System, the results of the survey clearly suggest that the Credit System is not perceived as a surveillance tool but rather as a tool to "improve quality life" that is part of technological progress. The advantages that this system guarantees are also considered very convenient and attractive. Commercial Credit Systems such as Sesame Credit are considered valuable because they offer their banking services with advantageous interest rates for loans and savings accounts for their users.

In the words of one respondent:

> SCS can create trust in society through feedback mechanisms. People with bad credit will be less likely to be employed and it will not be easy for them to access more funds in the future. Such punishments provide feedback to people with bad behavior to restrain themselves. Step by step, SCSs will create trust in society. (Interview 5, June 2018)

And of another one:

> Take, for instance, the example of using shared bikes. If someone does not lock a shared bike after using it properly, her or his own credit will be influenced. Alipay can collect such very detailed information from different aspects in life and include this in a score. Through such detailed accounting, SCSs can track individuals' actions and create trust in society. (Interview 10, June 2018 in Kostka 2018, pp 22)

Many respondents do not seem to care about the "surveillance" aspect as they already take it for granted that the Chinese security system already has all the means to access people's data and therefore if

"personal data is used for good reasons, (I think) it is acceptable" (Interview 8, June 2018 in Kotska 2018, pp 22)

A final point raised by Kostka is that the question about Credit System approval as worded in the online survey did not differentiate between commercial and governmental systems and this difference in the future should be emphasized as the goals of the two systems and how they operate are different. At the moment, the majority of respondents (59%) believe that the central government should be solely responsible for the nationwide management of the Credit System, and only 9% believe that this task should fall to local executive bodies. These results show that Chinese citizens currently trust the government more than local authorities. However, the Credit System initiatives are still at an experimental stage so it is possible that public opinion may change once the Credit System is made effective and mandatory for all.

Currently, the algorithms used to calculate individual scores are unknown; if this calculation remains unknown, it is possible that it will erode public opinion in the future, in part because as Kotska's study suggests, approval is based on the perception that scores are calculated in an unbiased manner.

## CHAPTER 3: ARTIFICIAL INTELLIGENCE WITHIN SOCIAL CREDIT SYSTEM: A HUMAN RIGHTS OVERVIEW

The 21th century can be defined as the “golden age of surveillance” with a widespread use of big data, algorithms and diffusion of automated processes. This golden age of surveillance concerns China as well as Europe, even though there are many differences that can be studied.

On April 2018 the European commission introduced its AI strategy at a time when Europe is lagging behind the United States and China in AI research. Europe cannot potentially lose out on the massive economic benefits that AI promises, which may add 10% to 12% to its GDP by 2030. The intensity of ambition is the most obvious contrast between Europe's and China's AI policies. In China, provincial and local governments are competing for business by committing hundreds of billions of CNY to AI research and development. The city of Tianjin alone is developing an AI fund with public and private investment totalling 100 billion CNY (about 13 billion EUR) - a sum unfathomable for many European nations, much alone localities.

Europe’s AI strategy implements far less ambitious goals than China’s, nonetheless this does not mean it hasn’t gone forward as of today.

In 2018, the European Commission decided to ask to all Member States to foster synergies and define shared goals for addressing social issues with AI solutions while taking ethical considerations into account. This strategy strives to make the most of AI's possibilities to build solutions for social good, i.e. technology that benefits society and the environment while adhering to European values and protecting basic rights. As a result of this concerted activity, the European Commission (EC) requested all Member States to create national plans, including projected investments and implementation metrics. This initiative builds on the European AI Strategy's ambitious objective to "become the world's leading region for creating and implementing cutting-edge, ethical, and secure AI, while advocating a human-centric approach in

the global context" (European Commission, 2018). In this regard, EU has made a lot of step forwards, for example in the ethical framework with the so called Trustworthy AI guidelines[58] (Ethical Guidelines for Trustworthy AI, 2019). According to the Guidelines, trustworthy AI should be:

- Lawful: respecting all applicable laws and regulations
- Ethical: respecting ethical principles and values
- Robust: both from a technical perspective while taking into account its social environment

The Guidelines include a list of seven important criteria that AI systems must satisfy in order to be considered trustworthy. A particular assessment list has been created to assist in the confirmation of the implementation of each of the major requirements:

1. Human Agency: Humans should be empowered by AI systems, which should allow them to make educated decisions and promote their fundamental right
2. Safety and technical robusteness: AI systems must be robust and secure. They must be safe, with a backup plan in place in case something goes wrong, as well as accurate, dependable, and repeatable.
3. Privacy and data governance: Aside from strict respect for privacy and data security, proper data governance procedures must be in place, taking into consideration the data's quality and integrity and guaranteeing legitimate access to data.
4. Transparency: The business models for data, systems, and AI should all be clear. Traceability techniques can assist in this endeavor. Furthermore, AI systems and their choices should be communicated in a way that is tailored to the specific stakeholder. Humans must understand that they are engaging with an AI system and be aware of its capabilities and limits.

[58] The AI HLEG is an independent expert group that was set up by the European Commission in June 2018.

5. Diversity and fairness: unfair bias must be avoided since it can have a variety of harmful consequences, ranging from marginalization of disadvantaged groups to the aggravation of prejudice and discrimination. In order to promote diversity, AI systems should be accessible to everyone, regardless of handicap, and engage all key stakeholders throughout their life cycle.
6. Societal as well as environmental well-being: All humans, including future generations, should profit from AI systems. As a result, they must be made to be both sustainable and ecologically friendly.
7. Accountability: Mechanisms for ensuring responsibility and accountability for AI systems and their results should be put in place. Auditability, which allows for the evaluation of algorithms, data, and design processes, is important in critical applications. Furthermore, appropriate and easily accessible remedy should be provided.

Going back to European AI National Strategies, a research was carried out by Foffano Francesca, Scantamburio Teresa, Cortès Atia and Bissolo Chiara from Ca' Foscari University of Venice, European Centre for Living Technology and the Barcelona Supercomputing Center. Their research (" European Strategy on AI: Are we truly fostering social good?") tried to investigate how European countries are dealing with the AI development and to which extent their plans can contribute to the society as whole. They carried out a qualitative analysis based on the different European AI National Strategies currently available. According to AI Watch (Vincent et al. Van Roy, 2020) 23 nations out of 27 have presented their strategy so far, but due to specific requirements the analysis was reduced to 15 nations, namely: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Lithuania, Luxembourg, Malta, Portugal, Slovakia, Spain, Sweden and the Netherlands.

The majority of the National Strategies (7 out of 11) include funding packages in AI activities (National Fund). These investments differ

depending on whether they refer to current efforts (Current Investment) or future intentions (Future Investment). Their descriptions are often general and indicate total quantities, which frequently include a variety of application areas.

By 2030, Belgium intends to invest at least EUR 1 billion in certain areas such as healthcare and life sciences.

Some techniques include data that relates to the digital transformation (Innovation). Another rising trend concerns investments in the private sector (Private), with a focus on supporting start-ups and SMEs in their adoption of AI, as they account for 99 percent of all business in Europe. As a result, it is apparent that early adoption of new technologies will help support in boosting AI innovation and competition.

While many papers outline generic investments (such as AI research and public cooperation), just a minority provide specific investments in the social good. The Netherlands, for example, reports investments in research on the influence of AI on labor and employment (Social Impact). Denmark and France discuss efforts to help people meet the challenge of learning new digital skills and preparing for the new jobs that will be generated as a result of the growth of AI technology, which will necessitate a new generation of specialists in many sectors. (Artificial Intelligence Literacy for Citizens).

To improve the EU's scientific and industrial capacity, Member States appear to be following the EC's direction in encouraging AI advancement in both the private and public sectors. According to a recent survey by the European Commission, 42% of European firms are currently adopting AI. Education is the most important idea in preparing society for socioeconomic changes. Despite the fact that it is a common goal in AI plans, the researchers found that fewer countries reported their investments in percentage terms (4 nations out of 11). These initiatives for population retraining and upskilling will play a significant role in involving society in the change. Indeed, AI literacy and education can help bridge the gap produced by AI's rapid growth between producers, who understand the technology's strengths and limitations, and consumers, who may be unaware of AI's capabilities

and therefore more vulnerable to negative uses. On the one hand, this will provide individuals with new possibilities to build AI-based capabilities at work and participate to the digital revolution that will define our society. On the other hand, culture will hasten the acceptance of new technology and its penetration into society, bringing to life the European Union's desire to better society. Different countries emphasize the need of including individuals in the process of developing future AI applications, particularly those that will be deployed and utilized by government agencies like Austria or Czech Republic.

Another important goal addressed by the different national strategies is the creation of an ethical and legal framework. For example, countries like Belgium, Denmark and Luxemburg state they want to create an ethical committee which will be in charge of supervise the use of AI systems.

Even though Europe still lack of concrete actions to define the trustworthy AI development path, we can see the effort in trying to aligning to the European strategic vision of AI.

What clearly marks the difference from China's AI development is the will to create since the very beginning an ethical framework in which AI can be fully developed. So, although Europe' AI strategy may put forward less ambitious goals, the ground foundation seems to be more in line with the respect of human rights.

Artificial intelligence, like other kinds of technology, reflects the culture and beliefs of individuals who design it and give the data frameworks on which it is based. As a result, AI technologies created in several nations or companies may provide diverse solutions to the same problem. This was made even clearer during the spread of Covid-19 (Ota, Z., Nikkei Asia, 2020)

In China, Social Credit System represents the last tool used by the Chinese government to harnesses data of its population to develop political goals (Meissner, M., Wubbeke, J., 2016). Clearly there have

been growing concerns over this tool and especially its impact on human right, these concerns became more and more pronounced after diffusion of Covid-19 when government has implemented the use of artificial intelligence and the consequent means at disposal - drones, surveillance camera etc (Mozur P., et al., 2020)- to control people and their social behavior thus intensifying the invasion of Chinese autonomous domain into the private life of citizens (Van Dick., J., 2014).

### 3.1 Human rights and China

The importance of human rights is recognized worldwide and it is used as an important parameter when evaluating the impact of new and emerging technologies (Raso F., 2018) by bodies like the UN High Commission for Human Rights, the G20, leading multinationals and many others. What is important and fundamental for all these actors involved in the defense of human rights is that they provide a global formulation of human values that artificial intelligence should not touch. It is not a surprise that the words "human rights" are believed not to go hand in hand with China which is not stranger to human rights violation. Even though China has ratified sixth of the nine core human right treaties demonstrating the recognition of treaties and standards regarding human rights, Chinese internal law keeps having mismatches with the international one. The complicated relationship between China and West is due to the fact that in China human rights are not considered in the same way, China rejected the universality of human rights and is willing to rely on its own model of human rights "based on Chinese characteristics" (Xi Jinping, 2017)[59]. As outlined in the article 51 of China's Constitution, for the CCP the maintenance of public order is the most important requisite, even at the expense of the fundamental

[59] Xi Jinping, 'Secure a Decisive Victory in Building a Moderately Prosperous Society in All Respects and Strive for the Great Success of Socialism with Chinese Characteristics fora New Era' Report Delivered at the19th National Congress of the Communist Party of China (18 October 2017) <http://www.xinhuanet.com/english/download/Xi_Jinping's_report_at_19th_CPC_National_Congress.pdf>;.

human rights, reflecting the Confucian ideology that values morality over the respect for individual rights (Huang,P., 2011)[60].

Despite the advantages that social credit system can bring to Chinese government like improving the access to the finance of poor people (Shahin,S., Zheng., P, 2018) improving compliance with courts, preventing criminals from evading consequences and reduce lender misleading (Yanhao, W., 2016)[61], it remains quite hard to justify these benefits looking at them from the perspective of the human rights ( Jessup, T., 2021)[62].

The human rights law stipulates that any restrictions on the rights of persons under state power and control must be necessary, reasonable and proportionate in order to pursue legitimate goals, and strive to limit other human rights as little as possible to ensure continued protection. And the effective rights of individuals. In addition, any violation of human rights must have the right to investigate and obtain remedies that can end such violations.

### 3.1.1. Right to Privacy

Social credit system challenges the right to privacy due to its ability to have access and share data with whomever without any restrictions, conduct indiscriminate surveillance over the population and reveal private data that won't be otherwise accessible. These issues are still addressed because the problem is a lack of a solid legislation that limit these practices.

Nowadays, as we can easily see from our online lives, the Internet has become ubiquitous and more private. With declining costs and disincentives to conduct surveillance, governments enjoy an ever-increasing ability to conduct simultaneous, invasive, targeted and large-

[60] Philip Huang, " Morality and Law in China, Past and Present (2015) 41(1) Modern China A Research on China's Privacy Standards and the Possibility of Establishing the Right to Privacy and the Information Privacy Protection Legislation in Modern China (Springer, 2011) 34-53.

[62] Jessup, Thomas, "I think therefore I AM?"- Artificial intelligence and the Chinese Social Credit System: A human rights critical analysis.

scale surveillance than ever before, emerging as a dangerous habit rather than an exceptional measure, without it being prohibited in any way.

However, it should be noted that Chinese people's idea of privacy is very different from ours. Indeed, Chinese citizens are no strangers to arbitrary and extensive forms of surveillance such as the Hukou, the family registration system, and the Dang'an, a registry on citizens' performance and attitudes. Arguably, because such surveillance mechanisms have operated with such opacity for decades within Chinese society, an intrusive program like the SCS may seem less critical to the Chinese public, as we've seen in the study demonstrating the lack of dissent toward the SCS among the Chinese public published by Genia Kostka.

However, considered an essential element of individual liberty, the right to privacy is universally recognized in a number of international documents, jurisprudence[63] and commentaries, which stipulate that the correspondence between people should be guaranteed de jure and de facto, both in offline and online environments. In fact, despite the apparent public consensus to this kind of system, there are urgent questions that Social Credit System raise.

First, just the fact that communication information are being catched up is an obstacle to the right of privacy regardless of whether the information will be used or not. Specifically, as already stated at the beginning of this chapter, SCS has no legislation that sets limits on data retention, data collection or restrictions on data sharing, this implies that the SCS in this sense violates the right to privacy.

Second, unlike Western paradigms of privacy and invisibility, the SCS openly declares that it monitors citizens. the idea that makes this possible is that the CCP views the right to privacy as an ethical bias rather than a fundamental human right. Notably, in China's most recent

[63] See: Big Brother Watch and Ors v the United Kingdom (European Court of Human Rights, First Section, Application Nos 58170/30, 62322/14, and 24960/15, 13 September 2018); Google Spain SL v Gonzalez (C-131/12, (2014) ECLI:EU:C:2014:317, [80].

Universal Periodic Review, Human Rights Watch expressed concern on this very issue, chastising the CCP's quest to employ the latest technologies, including biometric collection, artificial intelligence, and big data to bolster mass surveillance across the country without supervision, disclosure, or privacy protection.[64]

Third, the main issue raised is the need of clarity in legislation, that must be "just and predictable" (UN High Commission for Human Rights, 2008)[65] it should "specify the precise circumstances in which such interferences may be permitted"[66] and it should be "actually limited to what is strictly necessary" by not interfere more than required. Despite the influence of Western law and Chinese constitution, data protection and privacy legislation in China remains fragmented, specifically tailored and reactionary and thus leading to instances of abuse of a weak system. Exacerbating these problems are disproportionate punitive mechanisms that solidify the CCP's grip on privacy freedoms.

[64] Human Rights Council Working Group on the Universal Periodic Review, National report submitted in accordance with paragraph 5 of the annex to Human Rights Council resolution 16/21, UN Doc A/HRC/WG.6/31/CHN/1 (18 October 2018) [4]; 'There is no universal road for the development of human rights in the world...the cause of human rights must be promoted on the basis of the national conditions and the needs of the people of that country, and cannot be defined on the basis of a single authority...'; 'The people of each country all have the right to decide for themselves their human rights development path':
'China ramps up campaign to redefine 'human rights'' Bangkok Post (Online, 13 December 2019) <https://www.bangkokpost.com/world/1815339/china-ramps-up-campaign-to-redefinehuman-rights>, quoting Chinese Vice Foreign Minister Ma Zhaoxu; 'Countries need to bear in mind the practical circumstances, consider both universality and specialty, and strive to find a tailored and effective model of promoting and protecting human rights': 'Countries must follow path of human rights development suited to national conditions: Chinese envoy' South-South Human Rights (Online 27 November 2019) <http://p.china.org.cn/2019- 11/27/content_75452706.htm>, quoting Zhang Jun, China's permanent representative to the United Nations (UN); 'The CPC has a strong sense of exceptionalism on the field of human rights, which motivates their aim of undermining the whole system. Their willingness to do so, disregarding all claims to the universality of human rights, in order to advance their interests grates against the core of the liberal tradition of human rights': Alvaro Gomez del Valle Ruiz, '"A community of shared destiny": how China is reshaping human rights in Southeast Asia' (Ema Awarded Theses 2018/2019, Global Campus Europe)https://repository.gchumanrights.org/bitstream/handle/20.500.11825/1296/Gomez_del_Valle_Ruiz.pdf?sequence=1&isAllowed=y>.

[65] UN High Commissioner for Human Rights, Fact Sheet No 32 - Human Rights, Terrorism and Counter- terrorism, (July 2008) 45; Rotaru v. Romania (2000) V Eur Court HR 61, [57]–[58].

[66] GC 16, above n 142; Klass and Others v Germany (1978) 28 Eur Court HR (ser A) 214; Zakharov, above n 144; Klass and Zakharov confirmed that States do not enjoy an unlimited discretion to subject persons within their jurisdiction to surveillance; Cf Leander v. Sweden (1987) 116 Eur Court HR (Ser A) 433. In Leander, the ECtHR accepted that states should enjoy wide discretion, both in assessing the existence of a pressing social need and in choosing the means of achieving the legitimate aim of protecting national security.

Today, individuals attempting to investigate government surveillance are charged with crimes of " stealing state secrets[67]", which can also extend to police s under the State Security Law and the Cybersecurity Law if they do not provide information of individuals who oppose to CCP surveillance. Therefore, it is because of the lack of safeguards and protections China has inadequately fulfilled and protects the privacy rights of Chinese citizens that AI within the SCS is only bound to amplify.

### 3.1.2 Freedom of movement

The social credit system has been reported having banned more than 11 billion people from flying, 5 million from using high- speed train and 3 million from buying business class train tickets[68].
Freedom of movement, as expressly stated in article 12 of ICCPR, includes “the right to liberty of movement” and the ability “to be free to leave the country, including his own”. Any limitation to the freedom of movements, as for all the other human rights, should be the least intrusive instrument amongst those which can be chosen and moreover it should be compliant with the fundamental principle of equality and non- discrimination.

Clearly, freedom of movement is bit problematic in China, it regards absurd retrictions and punishments associated to international travel, intra- state travel and it’s also a problem of foreigners visiting China.[69]

[67] For commentary and a detailed explanation of the complex legal framework that make up China’s state secret framework, see: Human Rights in China, State Secrets: China’s Legal Labyrinth (New York, Human Rights in China, 2007). This report examines China’s state secrets system and illustrates how it functions to actually promote human rights violations by undermining the rights to freedom of expression. It concluded that by maintaining a culture of secrecy that has a chilling effect on efforts to develop the rule of law and independent civil society; Also see, for an example, ‘Dispatches: Shi Tao and the Dangers of China’s State Secrets Law’ Human Rights Watch (Webpage, 11 September 2013) <https://www.hrw.org/news/2013/09/11/dispatches- shi-tao-and-dangers-chinas-state-secrets-law>.

[68] For example, China has installed more than 20 million street cameras (the Sky Net Project) and 200 million CCTV cameras that enable the government to not only document criminal activity but also track individuals through facial recognition: Ivonne Teoh, ‘George Orwell’s 1984, Black Mirror: China’s Social Credit System Judges People as Good/Bad. Bad People Shamed on Digital Blacklist’ Medium (Webpage, 16 December 2017

[69] Ibid, 85. For example, in the Tibetan Autonomous Region, a government-designated tour guide had to accompany international tourists at all times.

### 3.1.3 Freedom of expression

The SCS violates freedom of expression ("FOE") in that it punishes self-expression, including the opinion of individuals within China's jurisdiction with disproportionately severe restrictions on individual human rights. The SCS also represents a comprehensive mechanism of coercion toward modifying people's behavior that is further likely to offend FOE.

States parties must ensure the right to freedom of expression, including the right to search for, obtain, and disseminate information and ideas of all kinds regardless of borders, including the self-expression and reception of communications of all forms of opinions and ideas that can be transmitted to others, including but not limited to political [70] and policy dissent[71], religious discourse[72], even dialogue that is considered highly offensive.

States have an obligation to ensure environments that are favorable to freedom of expression and that can provide individuals with the opportunity to hold their own opinions supported by principles of transparency and accountability. International law recognizes that FOE can be restricted under Article 19(3) of ICCPR which includes the ability to restrict the rights or reputation of others or to protect national security or public order. However, it has been noted that the restriction cannot endanger the right itself, any limitation imposed on FOE must be necessary and proportionate.

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[70] See Human Rights Committee, Merits: Communication No. 414/1990, 51st sess, UN Doc CCPR/C/51/D/414/1990 (10 August 1994) ('Mika Miha v. Equatorial Guinea').

[71] See Human Rights Committee, Judgment: Communication No. 1128/2002, 83rd sess, UN Doc CCPR/C/83/D/1128/2002 (18 April 2005) ('Marques v. Angola'); Also see Human Rights Committee, Concluding observations of the Human Rights Committee: Costa Rica, UN Doc CCPR/C/CRI/CO/5 (16 November 2007) [11]; Human Rights Committee, Concluding observations of the Human Rights Committee, UN Doc CCPR/C/HND/CO/1 (13 December 2006).

[72] See Human Rights Committee, Views: Communication No. 736/97, UN Doc CCPR/C/70/D/736/1997 (1 May 1996) ('Ross v. Canada'); Also see ICCPR, above n 92, Art 18(1): 'Everyone shall have the right to freedom of thought, conscience and religion. This right shall include freedom to have or to adopt a religion or belief of his choice, and freedom, either individually or in community with others and in public or private, to manifest his religion or belief in worship, observance, practice and teaching.'

Further, as a general rule, AI must not suppress, manipulate, or unseen interfere with the ability of individuals to form and maintain their opinions or gain access to and express ideas in the information environment.

However, in the Chinese context, FOE is already a persisting problem with censorship and suppression as a common measure used by the CCP. Although enshrined in Article 35 of the Chinese Constitution[73], FOE protection in China has been described as a "fiction" (David S. Law and Mila Versteeg , 2014) because FOE remains protected on paper but not in practice. In China, journalists and academics represent the most common victims, but it extends to variety of actors, including high-profile individuals such as Jack Ma, founder of Alibaba (Zeiger, H., 2021).

Automatic content review is another issue related to FOE. By incorporating traditional business credit into the assessment of social behavior[74], the ultimate goal of SCS autonomy not only shows that free speech is an anathema, it also shows that autocracy and FSO are contradictory concepts. Therefore, it is not difficult to imagine that artificial intelligence algorithms reduce a person's credit by "liking" anti-national posts on WeChat or increase credit by publishing a series of articles about the prostate, which only they will amplify when they are nationalized, which can be activated. Under the supervision of the China National Internet Information Bureau ("CCA"), it is deliberately vague to allow relatively harmless behavior to defend the blacklist.

[73] Chinese Constitution, above n 140, Article 35: "Citizens of the People's Republic of China enjoy the freedom of speech, of the press, of assembly, of association, of the procession and of demonstration".

[74] Meissner, above n 64; This has been amplified by the construction of centralized data infrastructures for data collection, mining, and analysis, see: R Diab, 'Becoming-Infrastructure: Datafication, Deactivation and the Social Credit System' (2017) 1(1) Journal of Critical Library and Information Studies 1.

## CHAPTER 4: THE IMPACT OF COVID-19

The impact of Covid-19 surely has shakened the entire universe forcing governments to take measures in order to try to stop or at least try to reduce the spread of Covid-19. Measures taken were the most variegates, from banning travelling, quarantine regulations, restrictions and imposed lockdown.

What has made the difference for the Chinese government is that on its part it could have relied on the Social Credit System which was suddenly thrown in the fray.

This chapter which is mainly based on the research carried out by Adam Knight (Leiden University) and Rogier Creemers (Leiden University) will try to address the following questions:

1. How Chinese authorities were able to strumentalize social credit system as a part of the response to Covid-19
2. In which way the crisis we're living in can help further develop and improve this system

These questions are important not only to understand the evolution and implementation of Social Credit System per sé but they are helpful also because they shed a light on how the Chinese approach to reforms will be.

Social credit system is part of a program that wants the government to be fully digitalized. The Covid-19 has been an unexpected test to see at what extent these ambitions were realized yet. Moreover, once more, social credit system reflected the highly decentralization inside China which for one part could be seen as a positive thing but on the other side it was another problem that needed to be addressed, in fact as it will be explained lately on this chapter, different localities took different approaches during Covid-19 as if they were completely distinct entities because this have always been the approach in doing things but clearly this came to be a huge problem with the spread of the virus and it didn't help in the attempt to stop its diffusion.

The most important thing to understand is that the decisions took during this pandemic are likely to be retained fully also in the future, so this chapter analyze not only short terms consequences and reactions but also several trends that could last longer than we might expect.

Started as a device for ensuring trust in the marketplace, social credit has developed into a potentially powerful tool for the enforcement of regulation both at national and local level (Creemers, R., 2018). During the pandemic diffusion, this system came to help the government which could immediately use it to impose social credit consequences to acts like overcharging for medical supplies, selling counterfeit medical goods, violation of quarantine and so on. On the other side, other elements of the social credit system were mitigated, mainly referring to individual and businesses meeting particular obligations. For example, taxation authorities were more flexible towards businesses that could not pay taxes and to individuals and societies who lost their income there weren't sanctions while they tried to adjust their repayments.
However, Covid-19 also constitutes an important test for the social credit system and the Chinese government, as well as for all the government worldwide, bringing to the light various weaknesses like data quality and quantity problems as well as problem of coordination and accessibility between different systems and databases used. In addition, the capabilities and skills required by the government during the pandemic started to create debates and discussion on the path to follow especially regarding use of technology and datas. In the context of social credit system, the crisis has shed the light on the behaviors considered by the system and doubts were raised on its applicability taking into account China's rule of law.
This pandemic has happened during the end of the first phase of social credit construction and the drafting of the related legislation, thus contributing to a change in its future shape.

## 4.1 Sources and methods of the research

As previously said, this chapter is based on the research of Adam Knight (Leiden University) and Rogier Creemers (Leiden University). Their paper is the result of studies of documents from central and local government regarding social credit system and its application during Covid-19.

Clearly due to imposed restrictions, it was not possible to conduct fieldwork in China during all 2020 forcing the research to rely on remote interviews and opensource materials. As the authors let us know, policy documents were rescued through "Credit China" platform and Peking university databases together with provincial websites[75]. The main strings used online were *yiqing*- literally translated as "epidemic situation" which in this case it specifically referred to the covid-19 pandemic together with correlated phrases which include included *shehui xinyong* (social credit), *lianhe chengjie jizhi* (joint punishment mechanism), shixin (untrustworthy) and *chengxin* (trustworthy).

Results were also compared with authors' own database of local credit system to ensure the completeness of the set of datas.

In total, the research is based on documents from 15 provinces and 19 municipalities[76].

## 4.2 The use of Social Credit during Covid-19

While as of today the origin of Covid-19 is still under debate, it's known worldwide that the epicenter of the first worldwide large-scale outbreak of the virus in January 2019 was in Wuhan, capital of the Hubei Province.

SARS-CoV-2 is a zoonotic coronavirus that is thought to have spread from an unidentified animal host to humans. Based on analyses of early-diagnosed COVID-19 cases, several efforts have been undertaken to

[75] 'Credit China', accessed December 3, 2020, https://www.creditchina.gov.cn/. 'PKU Law', accessed December 3, 2020, http://pkulaw.cn/.

[76] At the provincial levels, the areas took into consideration were the following: Anhui, Guangdong, Guangxi, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Qinghai, Shaanxi, Shandong, Sichuan and Zhejiang. At the municipal level, documents were retrieved from: Anshan, Fuzhou, Guyuan, Hangzhou, Huai'an, Nanjing, Nanning, Ningbo, Quzhou, Rongcheng, Shanghai, Shenzhen, Shijiazhuang, Taizhou, Wenzhou, Yangzhou, Yulin, Zhangzhou and Zhucheng

determine when the virus initially began spreading among people. The first cases were linked to the Huanan Seafood Wholesale Market, but according to research the market cluster is unlikely to have marked the start of the pandemic because the first documented COVID-19 cases had no connection to the market.

According to regional press sources, COVID-19 diagnoses in Hubei date back to at least November 17, 2019, indicating that the virus was already active when Chinese authorities implemented public health measures (Associated Press, 2020). Nonetheless, what remain an interrogative is why despite a raising number of suspicious cases and repeated warning from doctors and medical professionals, Chinese local authorities were reluctant to spread the alarm and let everyone know about the situation in order to prevent the diffusion of the virus, which at the end could not be stopped from spreading worldwide at such fast rate. Many opportunities were given to spread awareness given also the fact that this was happening during the Spring Festival which is the meaning of mass movement all around China.

The Chinese government was reluctant to act at first, hiding information from both the World Health Organization and the population, which resulted in the virus spreading further. After three independent government laboratories had properly deciphered the information, China still waited before publishing the virus's genetic map, or genome, for more than a week.

The genome was only provided by Chinese government laboratories after another lab published it ahead of authorities on a virologist website on January 11. Even so, China hesitated for at least two weeks in sharing WHO with comprehensive data on patients and cases, according to records of internal sessions conducted by the United Nations health agency, all at a time when the outbreak potentially might have been slowed. According to the recording acquired by the Associated Press, WHO officials were publicly praising China in order to get more information from the government but privately complained in meetings the week of Jan. 6 that China was not giving enough data to determine how much the virus traveled amongst people or what risk

it represented to the rest of the globe, which was wasting important time. (Associated Press, 2020).

Despite this debatable start, once the gravity of the situation was impossible to ignore, China was very quickly in taking strong measures which were taken as example by the rest of the world. In fact, although the hostility towards China in many areas of the world, it's clear that China has been very capable to quickly contain this public catastrophe. Three days after Xi's warning, on 20th January, Wuhan was place under strict lockdown and the nation entered the so called "people's war" (*renmin zhangzheng*) against the virus where everyone from the frontline medical personnel to food delivery people to journalists played a role.

Managing large-scale catastrophic emergencies, such as natural disasters and pandemics, needs an effective command chain, which is crucial for successful communication and interdepartmental coordination (Kapucu 2006; Weible et al. 2020). The Chinese central government created the Central Leading Group for Covid-19 Prevention and Control (hence referred to as CLG) as the main decision-making body in China's response to the pandemic on January 25. The CLG, which was made up of senior members of the Communist Party of China (CPC) Politburo and the State Council and was led by the Premier himself, reported directly to the CPC Politburo Standing Committee. The CLG was in charge of making strategic choices on pandemic control. The CLG's orders were regarded as uncompromising political duties to be completed by all members, with special political authority from the top. The central command system was extended to all local governments, which soon established local command offices for Covid-19 prevention and control. Local commands were led by CPC party secretaries and administrative chiefs, who were fully responsible for decision-making and task execution in their domains. To summarize, the institutional framework outlined above established a very rigorous and clear command chain, which is crucial in leading a huge country through a devastating epidemic.

(He, A., Shi Y., Liu H,, 2020).

It is in this context of "people's war" that Social Credit System, but not limited to it, played its role. The 15 provinces and 19 municipalities across China provided immediately to update their respective social credit systems and then they issued documents across all levels of governments with careful instructions on how to social credit system should be used to fight the pandemic.

### 4.3 Softening of SCS for businesses affected by the pandemic

One of the main concerns for policymakers was the economic impact of the pandemic, the choice between health and wealth was and still represents one of the most challenging trade-offs for all the governments worldwide.

As the Chinese government has shown to be very rigid and strict during the imposition of lockdown in China, the economic fallout was believed to be inevitable and quite heavy. The solution given to try to at least reduce this economic fallout was carried out by the SCS's leading planning body which opted for the softening of some of the system's rules, pausing financial functions with the goal of not putting too much pression on businesses.

For this reason, "'Notice on Further Strengthening of Financial Support in the Prevention and Control of the Novel Coronavirus Pandemic"[77] was released in January 2020 by a number of ministeries led by the People's Bank of China declaring that no businesses would have their credit rate impacted by the Covid-19. Moreover, subsequent notices reiterated that businesses that violated contractual or tax obligations due to COVID-related disruptions would not be blacklisted in the usual manner. China then continued to apply these measures after staving off

[77] People's Bank of China, Ministry of Finance, Banking and Insurance Regulatory Commission, Securities Regulatory Commission and State Administration of Foreign Exchange, '关于进一步强化金融支持防控新型冠状病毒感染肺炎疫情的通知' ['Notice on Further Strengthening of Financial Support in the Prevention and Control of the Novel Coronavirus Pandemic'], January 31, 2020, accessed November 23, 2020, http://www.gov.cn/zhengce/zhengceku/2020- 02/01/content_5473639.htm.

the initial threat, during the recovery stage. According to the SPC's Guidance for Enforcement Cases in Relation to the Novel Coronavirus, a temporary grace period is granted to companies facing difficulty resuming business or honoring their legal obligation.[78] The social credit system provided relief in more ways than one, as it did more than simply pause certain aspects of the system to prevent businesses from being overburdened. Through providing ease of credit to companies seeking to bounce back, the SCS was eventually mobilized in arguably a more tangible manner. The federal government issued a number of guidelines emphasizing the importance of credit-giving for restarting the economy, encouraging institutions to lend and simultaneously lowering entry barriers for borrowers to access credit. Companies were given access to a dedicated online portal through the Credit China platform to keep track of the changing landscape and to improve their credit literacy.
Besides suspending its scoring system, Alibaba's Sesame Credit announced new features to enable individuals to request that previous compromises be cleared from their record in order to easily obtain credit in the future.

Nonetheless, facilitating the flow of financial credit is only one of the narrow ways the system can be mobilized during the pandemic. As the scale of the governance crisis gradually emerged, many central ministries and commissions began to issue "notices" tongzhi), by introducing new behaviors of shixin into the blacklist system or strengthening existing legislation. Companies found to sell epidemic-related products without proper trademarks or licenses were blacklisted by the State Intellectual Property Office. The State Administration of Market Supervision has incorporated wildlife trading or fake masks into its system. With dozens of different schematics updated in this way, a common theme emerged. In Anshan City, Liaoning Province, as in many places, people hiding symptoms of the virus, hide recent trips,

[78] Supreme People's Court, '关于依法妥善办理涉新冠肺炎疫情执行案件若干问题的指导意见' ['Guiding Opinion on Several Issues Regarding the Proper Handling of Enforcement Cases in Relation to the Novel Coronavirus'], May 15, 2020, accessed December 2, 2020, http://www.court.gov.cn/zixun-xiangqing-229541.html.

evade medical treatment, or contact suspicious patients and disseminate unofficial, embargoed or unofficial information had to have their behavior registered in their personal credit file and being blacklisted. [79] Lack of participation in the city's monitoring system is also a punishable offense in many places. Similarly, companies that increase prices, make large profits, ignore business hours restrictions, or make it difficult to return to work in the country will be affected in a similar way.

These measures were quickly used to fight the virus.

4.4 The propaganda role of SCS: honouring the heroes in the war against the virus

For several years, penalizing through blacklists is only half of the social credit equation. Reflecting the development of the system using positive incentives, SCS was re-implemented not only to enforce new regulations related to COVID, but also to reward certain behaviors considered constructive in the fight against the virus. In Anshan, like many local programs, activities such as donating materials or funds, volunteering on the front lines, or reducing rents for small businesses are praised through the red list. In many places, the use of this social credit carrot far outweighs the use of sticks. Yunnan Credit's website listed 47 blacklisted events with 154 positive stories from people or businesses rewarded by SCS. In addition to strict credit records and general benefits, such as bureaucratic "green channels" entering government offices to speed up processing, since 2018, many programs have provided financial incentives to redlisted parties. The "Either+" (Xinyi Plus) framework provides model companies and individuals with cash payments, government utility and service discounts, and

[79] Anshan City Leading Small Group for Social Credit System Construction, '鞍山市进一步加强信用管 理工作积极防抗新冠肺炎疫情的实施办法' ['Anshan City Implementation Measures to Further Strengthen Credit Management Work to Actively Prevent the Novel Coronavirus'], February 20, 2020, accessed December 16, 2020, http://221.203.33.218/upload/files/2020/2/21102428283.pdf.

easier access to state-backed loans. In Jiangsu Province, CreditEase is used as a quick way to send much-needed funds to enterprises.

Although common themes and goals can be seen in SCS and its response to the pandemic in different places, with the wider deployment of social credit since 2014, the implementation of SCS-related policies varies from plan to plan. An obvious example is the use of credit points (xinyong fen) to quantify the positive and negative behaviors associated with the crisis. Only a few local systems use scoring as a way to measure the social credit status of one person or entity and the social credit status of another person or entity. Among them, Rongcheng City, Shandong Province is headed. All residents of Rongcheng, as well as all enterprises and government agencies, have obtained social credit scores. People start with 1,000 points, increase or decrease according to personal behavior, and transform into a grade from AAA to D. Companies and legal entities start with a score of 100 and rank from A to D. High scores can get a wide range of free public transportation and enjoy the privilege of preferential government bidding, while low scores will be subject to various penalties, such as career development restrictions or exclusion from state subsidies.

When the pandemic hit, like many other local social credit systems, Rongcheng issued an update of its plan. Anyone who is found not wearing a mask in public will deduct 10 points from their social credit score; if you do not self-isolate, you will lose 50 points, as will lunch with friends or family or playing mahjong.

These central city government instructions were disseminated in many places in Rongcheng for further reproduction and adaptation at the district level, creating a network of dozens of COVID-related SCS files.

### 4.5 Social Credit Reform after Covid-19

The fast reshaping of social credit demonstrated one of its key advantages as a governance mechanism: flexibility in implementation, which has allowed social credit to be accepted and adapted to local conditions and policy goals. Surprisingly, this adaptability turned out to

be both a strength and a weakness in the system's reaction to the epidemic. As part of a strategy of experimentation, local governments have been encouraged for years to explore their own variants of the SCS. Hundreds of other variants of the SCS have subsequently appeared, all based on the same 'social credit idea,' but varied in design, purpose, and technological setup, and each reacting to COVID-19 in somewhat different ways. However, this strategy of differentiation has proven to be unhelpful in time of crisis when a unique and joint response was necessary. The SCS remains a system of systems without sufficient interoperability standards, with individual methods unable to communicate on a data level with their counterparts, frequently even in the same province.

The creation of an “island of siloed data” was always believed to be a key point in the implementation of the system, nonetheless it came out to be a great obstacle.

Recently, a few endeavors have risen to undertake and encourage more noteworthy integration of SCS at the territorial level. One example is provided by the Yangtze River Delta Social Credit System which has tried to align different systems arised between Zhejiang, Jiangsu, Anhui Provinces as well as Shanghai.

All these efforts were accelerated with the spread of Covid-19. As a result of China's public health response to the disaster, there was an immediate demand for medical data exchange on a scale never seen before. During the pandemic, the Yangtze River Delta Region created an interface for member municipalities to share public health data, resulting in the collection of 14.9 million data points. Misaligned local legislation and a lack of technological standardisation hampered the project, leading many regions to step up their efforts to enhance cross-regional coordination. One example was the case of Qingpu district in Shanghai which together with Jiashan country in Zhejiang and Wujiang district in Suzhou, awarded as “model” city-level social credit system, established a digital model zone as part of their pandemic response, to combine their information-sharing protocols and ensure reciprocal

recognition of social credit blacklists and redlists, a major step forward in the overall development of the SCS, at least at the regional level.

While problems remain, the pandemic has provided a renewed incentive for the SCS to continue to reshape and expand. Many authorities believe that the crisis has highlighted the possibility of a fully integrated and functioning SCS in a post-COVID future. In late May, State Council guidelines emphasized the use of big data-based solutions for future virus prevention and control, while a meeting of the Central Commission for Comprehensively Deepening Reforms in April explicitly stated the need for reinforced disciplinary and reward mechanisms in public health[80]. The pace of implementation has accelerated. There are also indications that credit-based regulation methods are being broadened as part of a new phase of social credit growth. Xi Jinping emphasized the development of "new credit-based regulatory institutions" at a meeting of the Central Financial and Economic Affairs Commission in September 2020, a term that has slowly moved into government rhetoric since the Summer of 2019, referring to the use of credit-based processes in a wide range of policy areas just outside of the original scope of the SCS.

However, the spread of the SCS under the pretext of COVID-19 prevention and control has not gone unnoticed. Indeed, although the crisis has proved the system's worth and provided motivation for reform when flaws have been identified, it has also heightened policymakers' anxieties and increased public scrutiny of China's "smart state" as a whole. Since its conception, the SCS has been a contentious initiative among a small but outspoken group of Chinese politicians and academics.

Disagreement about whether data or behaviors should or should not be regarded as part of the system has been one of their main issues.

[80] State Council, 'State Council issues guideline on regular COVID-19 prevention', May 8, 2020, accessed December 3, 2020, http://english.www.gov.cn/policies/latestreleases/202005/08/content_WS5eb54d41c6d0b3f0e9497377.html.

COVID-19 has given many local officials permission to broaden the scope of their social credit systems, allowing them to include a wider range of activities. In Shenzhen, for example, human eating of cats or dogs has been declared prohibited because to the virus, with infringements being recorded as part of the city's SCS.

Many social credit purists argue that such gradual system modifications have undermined the system's effectiveness in accomplishing its basic goals, namely providing economic credit and enforcing court rulings, over time (Fu,W., 2020)[81]. In fact, they believe that small infringements of the above cited rules should not prevent people for example from take-out mortgage or from having privileges and also access financial products. A clear distinction between activities and their impact is needed.

With the spread of pandemic, people is becoming more concerned with another aspect of the social credit system which is the "credit recovery", in other words the ability of both individual and business to restore a damaged credit status (Creemers, 2020).

The concern is that parties will continue to bear the penalties of a social credit violation even after a legal penalty or punishment has been completed. Others have questioned the SCS's use of positive incentives, which reward specific behaviors or activities, as a type of silver bullet solution for problems that have little to do with the credit system and thus risk undermining its credibility. The fear is that, over time, this may lead to the creation of a'moral dossier' (daode dang'an) via proxy, a record that is more focused on one's day-to-day alegal behaviors than on criminal crimes, putting the SCS at odds with China's rule of law initiative.

The central government is concerned about the SCS's slow but unmistakable penetration into its boundaries. Overzealous bureaucrats have increasingly brought local governments into conflict with higher-ranking officials over the SCS's application to a broader variety of political problems. Media reports from local schemes like Rongcheng

[81] Fu Weigang, '"征信"扩大化，或变身"道德档案"' ['Credit is Expanding, or is it Transforming into a "Moral Dossier"'], April 21, 2016, accessed December 4, 2020.

promoting blood donation as a method to enhance one's credit score began to take root in the summer of 2019, causing the NDRC to release guidelines warning against inappropriate growth of the credit system.

Additional top-down orders were sent in July 2020 and November 2020, probably in reaction to SCS's growth in the fight against COVID-19. According to new statements from the NDRC and the Council of State, all black and red lists should be based on central legal criteria, and anybody who fails to fulfill them by next year's deadline will be ejected from the SCS and disbanded.

However, the state's increasingly intrusive use of technology in governance has alarmed more than just academics and legislator, and China's "health codes" is one of the example of the public awareness and especially disapproval of the development of a deeper relation between data and social control. Over one billion Chinese inhabitants lived in cities in May 2020, with color-coded applications allowing healthy residents to pass while recording and quarantining individuals who had been into touch with the sick. Many of these ideas have serious privacy concerns. Hangzhou's Health Commission stated in the summer that it will be expanding its system, replacing the three grades of color-coding with a points-based sliding scale from 0-100, at a time when many health codes were being phased out as the crisis subsided. Scores would be assigned to a variety of behaviors for example the act of smoking five cigarettes would lead to a deduction of 3 points.

The statement generated such a controversy online and in the media that officials were obliged to release a statement four days later explaining that the system would not be launched. Quantification of such behaviors was viewed by many as a major intrusion into people's lifestyle choices. This example on the one hand, shows a government's aim to manufacture particular behaviors using data and point scoring. On the other hand, it shows a level of public attention around the country's smart state deployment that these municipal public institutions do not appear to have expected.

# CONCLUSION

As discussed in the previous chapters, the spread of Covid-19 had a huge impact all over the world, in every fields. This thesis specifically studied the short as well as long-term consequences of Covid-19 focusing in the particular context of artificial intelligence, mainly the use of Social Credit System.

In this view, the SCS may be examined on two levels: as a stand-alone policy instrument for incentivizing compliance with laws and regulations, and more generally as part of the CCP's broader reform agenda, where it is one component of an increasingly digitized smart state. The system's adaptability as well as its flesxibility was on full display when it came to face the urgent pandemic situation. Some aspects of the system were relaxed to give relief to people and organizations that may otherwise incur social credit repercussions as a result of contracts or promises they couldn't keep. Social credit was also useful as a propaganda tool to reward and recognize the efforts carried out by companies and individuals.

While it is hard to quantify the SCS's contribution to the wider effort to contain the pandemic, its widespread use shows it has evolved into a key governance instrument, even in the midst of a severe and unanticipated public health catastrophe. However, the crisis served as a stress test, revealing many of the problems that the SCS has been facing since its beginning. On the one hand, its fragmentation enables flexibility and adaptation, but it also makes national or even regional interoperability extremely difficult, if not impossible. The epidemic has pushed regions in their attempt to try to better integrate data resources, but there is still a lot of work to be done on a national level. Despite these challenges and the problems that still need to be solved, the government now is seriously taking into consideration the great role that credit-mechanisms have, especially in the health protection as well as in the post-pandemic economic recovery, insisting for an improvement of the technical aspects of the system.

Clearly the social credit system does not go away without criticism. Some criticisms come from its original creators which believe that the system should remain focused only on market economics without keeping adding functionalities which don't belong to its initial purpose.

This research's preliminary findings provide rich ground for further investigation. The degree of acceptability of the current iteration of the SCS, as well as the elements that could impact public opinion in various scenarios for its future growth, is a primary area for investigation. On the one hand, one may argue that people are becoming more familiar with digital government, as seen by the widespread use of mobile phone applications, and that they would accept a steady expansion with ease. On the other hand, the fact that citizens in the past few years have been more tolerant towards highly strict governmental actions does imply that the situation won't change. In fact, they might not be as open to the ongoing collection of health-related or other highly personal data, nor to providing information as they have been in this difficult period of uncertainties.

Another aspect that remain pending is the government's learning process in setting up a smart state. The Party's firmly technocratic approach may work well in theory, but putting it into practice would necessitate decisions, trade-offs, and compromise. Intergovernmental discussions will determine how they are handled, with facts, assumptions, and ideas being carefully exploited to further political objectives. A detailed knowledge of how such procedures work will not only help us better comprehend China's digital governance initiative, but will also reveal how the Party-State approaches its most difficult and long-term challenges: achieving its intended development goals in increasingly complicated locally and internationally environments.

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