

INNOVATION AND DIGITALIZATION: CHINA THROUGHOUT TIME

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Chinese civilization has never been one to shy away from innovation. In fact, many of the world's modern-day technologies owe their roots to the Ancient Middle Kingdom. One of the many noteworthy inventions during this era was paper. The implications of papermaking went beyond the realm of commercial stationery use and directly influenced Ancient Chinese economy. Over time, the Chinese began using paper not only as a writing platform, but even as a currency. This completely revolutionized the economic landscape of Ancient China. To this day and age, China still continues to innovate and change the way we live. Brought about by today's Digital Age, developments in the world of mobile payments along with the increasingly widespread use of smartphones throughout the country, have drastically decreased China's reliance on cash, sparking a shift from cash to e-cash payments. Today, WeChat and AliPay can be used to pay for practically anything in major Chinese cities; and all it takes is a scan of one's smartphone to complete a transaction. This rise in

e-cash payments seems to be accompanied by a flourishing of e-commerce platforms as well, such as Alibaba and AliExpress. As people in society constantly seek out more efficiency and convenience in their day-to-day lives, the call to innovate and integrate these technologies becomes all the more essential. China has always been at the forefront of revolutionary ideas. And true enough, the Chinese continue to deliver. In this paper, we shall be studying in-depth the steps China has taken to further integrate technology into our lives. We shall delve into both the positive and negative aspects of their innovations and reflect on what it could entail for humankind's future as a digital society.

In Ancient China, much like any other ancient civilization, the primary mode of commercial exchange was barter. This refers to the interchange of certain products of the earth, such as wheat or rice, or of men's manual labor. . . by means of which the necessary and much desired articles were obtained (Schjöth, 1976). Over time, however, a shift in commercial patterns would be observed, and a new form of exchange would rise above the existing system of trade. The value of a good would start to be measured in terms of units, and these units would in turn be represented by a uniform system of payment—a form of currency. The invention of currency was a major breakthrough in human society because it allowed for a smoother flow of transactions. In this new system, a “medium of exchange” is present. This is defined as an intermediary good that is used to facilitate economic transactions, such as buying and selling. One key characteristic to currency as a medium of

exchange involves having a standard of value that is agreed upon by everyone. In Ancient China, there have been multiple records of goods that have been used as a medium of exchange—namely: silk, shells, and metals. By transitioning from the conventional system of barter to a form of currency, an increase in efficiency and convenience was observed. Let us say that our agreed upon medium of exchange would be shells. An individual who wishes to trade Good A with Good B cannot do so if the owner of the latter does not wish to own the former. However, this now becomes possible through the mediation of a form of currency. Since a currency is supposed to reflect a good's value, Good A can be sold to Person C for its worth in shells. Then, these shells can be used to purchase Good B, in accordance to Good B's worth in shells. And unlike goods and merchandise that are subject to decay, currency lives on. It can easily be stored and transported to different areas to facilitate economic transactions.

By 105 A.D., Chinese civilization would invent a material that would change the course of human history and revolutionize the field of currency—paper. Papermaking was said to have begun during the Han Dynasty, care of a court official named Cai Lun. At its onset, it became famous for its widespread use as a writing platform. Eventually, it replaced the use of bamboo strips and turtle shells as a preferred writing surface. However, its potential as a form of currency was not realized until centuries later. During the Tang Dynasty (618-906 A.D.), the first use of paper as a medium of exchange was observed. The specific type of paper used

to conduct monetary transactions was referred to as 飛錢 (fēi qián) or “Flying Money.” It was called this way because the currency was so lightweight, relative to coins, that it would fly away with the wind. The transition from metal coins to paper money, however, was largely unintended in nature. It is believed that this practice of circulating paper originated from the merchant class. Ancient establishments would allow an individual to deposit large amounts of valuables for a fee. This service would be for the purpose of safeguarding the item for the individual. Due to the nature of their work, merchants would have to travel great distances for the sake of doing business. And having to carry large amounts of metal coins would prove a heavy burden. Whenever a merchant would deposit valuables in the said establishment, he would be issued a note written on a piece of paper. This paper would lay claim to whatever valuable has been deposited. Over time, merchants noticed that these “notes” could be used to facilitate exchanges. Transferring it to someone else would mean allowing them to lay claim to the deposited valuables instead; hence, paying them. The idea was revolutionary. Slowly, the concept made its way all over China. It wasn’t until the 13th Century that the idea of paper money would be introduced to Europe. And even after its introduction, it would be another few centuries before it would catch on. The first paper money in Europe was printed in the 17th Century, more than 700 years after the Chinese came up with the concept. Until today, money as a medium of exchange is still widespread. It has made conducting transactions more convenient and efficient worldwide.

Countries all over the world even have their own respective currencies, with which their economies are subsequently valued. China has revolutionized the way the ancient world transacts business. They have paved the way towards monetary transactions as we know them today. However, as far as innovation goes, China is far from over.

The internet was invented during the 19th Century. Since then, the world has come a long way in terms of interconnectedness. Early this year, it was estimated that more than half of China's massive population now goes online. In a country with over 1.37 billion people, these numbers are astounding. A statistical report made in January 2017 found that of the “online” population in China, roughly 700 million of them are mobile internet users. This number alone makes up about twice the entire population of the United States of America. And surprisingly, this figure is still expected to grow by at least 6% in the coming year.

With the apparent rise in mobile internet usage, Chinese companies have taken it upon themselves to introduce a new form of payment that would revolutionize the way the Chinese handle money. The shift towards mobile payments is spearheaded by two big firms—Alibaba and Tencent. Combined, they make up roughly 92% of the total Chinese mobile payment market. In the year 2016 alone, mobile payments in China have amounted to more than RMB 58 trillion, roughly USD 8.6 trillion. This transaction volume is expected to grow with a 68% rate over the next 2 years, meaning the number of people opting for mobile payments is still growing

at a huge rate. *The Financial Times* even said that the volume of mobile payments in China is nearly 50 times greater than those in the United States.

The Alibaba Group was founded in 1999 by Jack Ma. It is an e-commerce company that connects buyers and sellers together in a giant online portal. In it, companies from all over the world are free to come together and transact business. Currently, it is the world's largest online retailer, with annual revenue reaching an astounding RMB 158.3 billion in the latest fiscal year, which equates to almost US\$ 23 billion. It boasts of operations in more than 200 different countries. In fact, ever since 2015, its online sales have consistently surpassed those of all US retailers combined. One of Alibaba's most notable features, however, is its invention of "Alipay." Alipay is a third party online payment platform that was created in 2004. With it, a user is free to make online payments to over 460,000 Chinese businesses. In fact, it has been widely referred to by the West as being the "PayPal" of the Chinese market. However, with regards to penetration, the number of Alipay users far exceeds that of PayPal. The former boasts of 450 million users worldwide, while the latter only accounts for 210 million.

Another company worth mentioning is *Tencent Holdings Limited*, or "Tencent" for short. It was founded in 1998 by Mr. Huateng Ma and his constituents, with its headquarters being located in Nanshan District, in the special economic zone of Shenzhen. This company specializes in a variety of online products

and applications, ranging from social media platforms, e-commerce, instant messaging, and even online games. Just recently in May 2017, Tencent's market value grew to over US\$ 343 billion, earning it a spot in the world's top 10 most valuable companies. And the reason for this title is an application with almost 940 million active users as of June 2017—WeChat.

Outside of China, *WeChat* may seem like just an ordinary instant messaging application like *WhatsApp* or *Facebook Messenger*; but inside China, it is clearly more than just that. Ask for any Chinese man's business card, and chances are that one of the written details would be their *WeChat* account. In the United States, it is more common to hand out business cards with details such as mobile numbers and e-mail accounts. Handing out *WeChat* accounts is almost equivalent to Westerners exchanging *Facebook Messenger* details. However, making this direct comparison turns a blind eye to the revolutionary nature of *WeChat* as an application. Walk along any bustling city in China and one will notice the *WeChat* logo posted everywhere—from billboards to business cards, and even roadside street vendors. It is not only used for instant messaging. In fact, the application allows users to synchronize their bank accounts to their *WeChat* accounts for various monetary transactions through *WeChat Pay*. In the application, each user is given their own personal "Wallet." The money in the wallet can be wired to and from the person's linked bank account. With it, users are free to make purchases freely, without having to use cash in real life. And all it takes is a simple

scan of one's *WeChat* QR Code. There are even features that allow users to transfer money from one person to another, or even give them away in the form of "Red Packets." This method of payment has revolutionized the way money is circulated in China. Nowadays for example, even small side stalls have options for *WeChat Pay*. Imagine being able to walk up to an ordinary fishball vendor on the side of the road, and being able to pay for it via phone. That's how efficient, convenient, and widespread this application is. The call for speed and efficiency in making economic transactions has once again led the Chinese to combine technological innovations with their everyday lives to develop a system that is uniquely Chinese in nature. It is a form of innovation that has been custom-fit to the Chinese culture as well. This seamless integration of technology into Chinese society has been the topic of discussion in many countries around the world, who are looking to China for inspiration. And in the same way, many foreign businesses are looking to tap into the Chinese market by making their stores compatible with *WeChat Pay* and *Alipay*. Already, there are countries abroad such as Japan and Thailand who wish to tap into the influx of Chinese tourists. Consider it the Chinese Diaspora of the digital age. As the world of mobile payments continues to evolve, the list of available services shall be quick to follow.

However, as with anything in life, these advancements must always be taken with a grain of salt. Some of the greatest concerns that outsiders seem to have with regards to China's new system are

data privacy and freedom of speech. Indeed, the internet is a very powerful tool capable of connecting people from all around the world and revolutionizing the way we go about our day-to-day lives. And China, being a firm believer in government regulation, has taken it upon itself to control it. Hence, the creation of *The Great Firewall of China*. This refers to the nationwide censorship of various online content that is deemed unfavorable by the party. It is the largest system of censorship in the world. Through this system, the government is able to screen banned statements, sentiments, and ideologies from online platforms. The government monitors one's every move online, and regulates content to be in line with its main philosophies. Applications and websites like WeChat, Baidu, Weibo, etc. are not exempt from this. This form of media censorship doesn't just deal with the banning of platforms such as Facebook, YouTube, Twitter, Google, and Instagram. On a personal level, the government has the ability to delete posts and render alarming information inaccessible to people. And on a political level, the government has the ability to track one's systems of beliefs and sanction those who do not subscribe to the common national ideology. One example of a banned topic in China is the practice of Falun Gong. Seen as a threat due to its large number of practitioners, enthusiasts of this art are said to have been either tortured, arrested, or murdered. All media content related to Falun Gong is inaccessible in China, and practitioners who express their sentiments online are easily screened by authorities and arrested. Early this year, more than 590 Falun Gong practitioners are said to

have been either harassed or arrested for their beliefs. Many of these practitioners experienced home raids after posting pro-Falun Gong sentiments on WeChat (Minghui, 2018). These examples give us a glimpse of just how powerful and unforgiving the Chinese government can be with its control over the media.

China's digitalization brings with it another threat as well. Given China's big population and massive land area, the government sees a need to effectively monitor and regulate its people, both online and offline. They hope to do this through the Social Credit System. This Social Credit System is set to be fully operational by the year 2020, and it integrates various systems designed to influence behavior, both on social media and in one's day-to-day activities. Here, every citizen will be given a social ranking based on actions that are deemed socially-desirable. Unfavorable actions such as bad driving, spreading fake news, stealing, and the like will merit deductions, while favorable actions will merit additions to one's score. This system makes use of cameras placed on every Chinese street in order to actively monitor each of their citizens' actions. Online activities will also be subject to protocol. Meanwhile, state of the art facial recognition technology allows personal ratings to be changed in real time. A person's ratings will determine their ability to avail of state privileges such as riding the plane, availing fast internet, entering good schools, getting good jobs, staying at nice hotels, and many more. Many people, including the Human Rights Watch have called this system "chilling" and disturbing. Although the people

with higher rankings seem to enjoy greater perks in society, we must not forget the implications this will have to those unfortunate enough to end up at the bottom of the spectrum. Currently, a blacklist already exists for people whom the government has labelled as bad citizens. This list isn't limited to state criminals; but rather includes various political and state rivals as well. Citizens who go against the political ideologies of the state will have it the worst. An example of this would be lawyer Li Xiaolin who found himself unable to purchase airplane tickets for local flights. The state also withdrew his right to apply for credit cards as well. He experiences slower internet speeds, less mobility, and an outright denial of a number of rights. The most frightening part about this system is that if it were to be implemented without a stable framework for check and balance of power, then abuses and unjust exploitations are bound to happen. A system like this could curtail freedom of speech and lead to a society of fake citizens who merely try to survive in a system that forces them to be good. This begs the question—who really benefits from this type of system? Is it the people, the society, or the government?

It is undeniable that the Chinese have a knack for innovation. Through them, we learn to push the boundaries of various forms of technologies, revealing all sorts of untapped potential. We see how innovation has led to revolutionary systems that have now become big parts of Chinese society. Nowadays, it is impossible to leave one's home without their smartphone. Progress has invariably been associated with digital interconnectedness.

However, despite all the benefits that such a world brings us, we must continue to be wary about the threats that come along with it. China is once again changing the course of history. Whether for better or for worse is almost completely based on perspective. Much like any other system, there are bound to be good aspects as well as bad ones. While I do admit that the innovations put forward by the Chinese have revolutionized many aspects of our lives, I also would like to question where the fine line between progress and freedom lies. Every day, we hand over more and more information to those who monopolize data, seldom pausing to give it much thought. In an economic and political sense, there will always be tradeoffs. In our quest for greater efficiency, what gets lost along the way; and are these worthwhile prices to pay for society?

References

- Atkins, M. F. (2015). *Ancient China*. Minneapolis, MN: Abdo Publishing.
- Chen, C. (2017, July 11). Tencent's WeChat Pay targets Chinese outbound travellers in overseas push. Retrieved from <http://www.scmp.com/business/companies/article/2102224/tencents-wechat-pay-targets-chinese-outbound-travellers-boost-its>

- Chen, Y. (2014). *Chinese currency and the global economy: The rise of the renminbi*. New York: McGraw-Hill Education.
- Chinnery, J. D. (2013). *The civilization of ancient China*. New York: Rosen Publishing.
- Deng, Y., & Wang, P. (2011). *Ancient Chinese inventions*. Cambridge: Cambridge University Press.
- 590 Falun Gong Practitioners Arrested or Harassed for Their Faith in January and February 2018. (2018, April 08). Retrieved from <http://en.minghui.org/html/articles/2018/4/8/169305.html>
- He, W. (2017, August 3). Alipay, WeChat Pay vie for customers. Retrieved from http://www.chinadaily.com.cn/business/tech/2017-08/03/content_30337784.htm
- Inside China's booming sharing economy. (2017, August 01). Retrieved from <https://www.cbsnews.com/news/china-popular-sharing-economy-exploding-didi/>
- Lipton, J. (2017, July 18). Investors are piling in to the bike-sharing boom in China. Retrieved from <https://www.cnbc.com/2017/07/18/bike-sharing-boom-in-china-pedals-to-new-heights.html>
- Ma, D. (2012). *Money and monetary system in China in the 19th-20th century: An overview*. Economoc History Working Papers 159/12. London School of Economics and Political Science, London, UK.
- Samuels, C. (2014). *Technology in ancient China*. New York, NY: Gareth Stevens Publishing.
- Schjøth, F. (1976). *Chinese currency: The currency of the Far East*. London: Andrew Publishing Company.

- Schjøth, F., & Hancock, V. (1965). *Chinese currency (Currency of the Far East): A comprehensive text: Chou dynasty (1122 B.C.-225 B.C.)*. Iola, WI: Krause Publications.
- Tan, K. (2017, January 31). 14.2 billion virtual hongbao were exchanged over WeChat on Chinese New Year's Eve. Retrieved <http://shanghaiist.com/2017/01/31/14-billion-virtual-hongbao/>
- Tian, S. (Ed.). (2016, January 28). Xinhua Insight: How WeChat changes lives. Retrieved November 01, 2017, from http://news.xinhuanet.com/english/2016-01/28/c_135053339.htm
- Tullock, G. (1957). Paper Money- A Cycle in Cathay. *The Economic History Review*, 9(3), 2nd ser., 393-407. <https://doi.org/10.1111/j.1468-0289.1957.tb00671.x>
- Vissering, G., & Roest, W. (1913). *On Chinese Currency: Coin and Paper Money*. Amsterdam: De Bussy.
- Vissering, W. (2008). *On Chinese currency: Coin and paper money*. Whitefish, MT: Kessinger Publishing.
- Wagner, D. B. (1986). Ancient Chinese copper smelting, sixth century BC: Recent excavations and simulation experiments. *Historical Metallurgy* 20(1), 1-16
- Yan, S. (2017, April 18). Chinese bike-sharing start-up says it's now worth more than \$2 billion. Retrieved from <https://www.cnbc.com/2017/04/17/ofo-chinese-bike-sharing-start-up-says-its-now-worth-more-than-2-billion.html>
- Yu, L., & Yu, H. (2004). *Chinese coins: Money in history and society* (Vol. 7). San Francisco: Long River Press.