

## Empirical Case Study for Artificial Intelligence: Improving the Way of China Industrial Transformation

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### Abstract:

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There is no doubt that Artificial Intelligence (AI) is becoming a critical factor that will influence almost all of the vertical industries; Manufacturing, customer service, finance, healthcare and transportation. The core theme of the present study is to evaluate Chinese developments in the field of artificial intelligence and their role in industrial transformation. The study used qualitative technique to approach the major objectives of the research. Up to date, Chinese AI giants like Baidu, Alibaba group holding and Tencent has achieved some of the major break throughs in the field of artificial intelligence. The study advocates that in China, AI will be an influential factor intrans formation of some industries like healthcare, transportation and e-commerce. The paper also enclosed some suggestion toward artificial intelligence which would be useful in deployment of AI in China.

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**Key words:** Artificial Intelligence, Industrial transformation, China

### 1 Background

The Quest to create a non-biological intelligence dated back to 19<sup>th</sup> century, earlier to the formal establishment of artificial intelligence field (Le Spector. 2006). William Paley, one of the former researcher in the field of artificial intelligence made an explicit assumption and argued that “intelligent designers are the critical players to produce a complex adaptive system” but was criticized by Charles Darwin in 1859 who gave the idea of “existence of competence without comprehension”. Darwin argued that “complex and adaptive design could be created without an intelligent designer, through a process of selection acting on random variation”. Based on evidences from evolutionary theory, molecular biology and paleontology, we realize that almost all of the interesting features of biological agents, together with intelligence, have ascended through Darwinian evolutionary processes with a few imperative modifications.

To explore the concept of AI, it is necessary to study the views of different school of thought as all of the AI text opens by defining the underlying field. Literature reveals that some of the proposed definitions of AI are explicitly concerned with design, apparently design by the intelligent humans. Like as, (Dean et al. 1995) proposed AI as “the design and study of computer programs that behave intelligently”. In contrast, (Winston. 1984) argued that AI is “the study of ideas that enable computers to be intelligent”. Another AI researcher (Charniak and McDermott. 1985) postulate that AI is “the study of mental faculties through the use of computational methods”. None of these definitions advocates the AI is concerned to design. In the recent era, research in the evolutionary computation is on its peak and an increasingly mature and stable research community is going toward evolutionary computation. Nonetheless, the right direction to achieve AI’s long-term goals will probably underpin both the process of evolution as well as human design.

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Although, in current era, most of the computer scientists are reentering an earlier field of study which argues tapping AI through evolutionary processes will lead to the development of smarter and more efficient algorithms. Consequently, most of the brain-inspired AI development enclosed to “neural networks” a term lent by neurobiology that defines machine thought as the movement of data through interconnected mathematical functions called neurons. Though, artificial neural networks mimic the procedure of learning individual concepts. Scientists in neuroevolution are trying to create a process that built parts of the brain, the process by which only the strong neurons survive.

## 2 Literature Review

### 2.1 AI definition

Artificial intelligence is a broad concept, for all that it can be define on the basis of its caliber, which define the three major categories. Artificial Narrow Intelligence (ANI) sometime described as Weak AI is that specialized in only one area. Like, AI that can only defeat the world chess champion in chess, but it's the only thing it can do. Artificial General Intelligence (AGI) sometime denoted as Human Level Artificial Intelligence alludes to a computer that is as smart as a human or a machine that can perform any intellectual task that a human being can. To create AGI istoo much complex than creating ANI, whilst there many breakthroughs in artificial general intelligence. According to Professor Linda Gottfredson, who describe intelligence as “a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience.” Artificial general intelligence would be capable to perform all those activities as easily as a human being can. The third dreadful class of AI is Artificial Super Intelligence (ASI). An Oxford philosopher and leading AI thinker (Nick Bostrom. 2014) defines super intelligence as “an intellect that is much smarter than the best human brains in practically every field, including scientific creativity, general wisdom and social skills”. Artificial Super intelligence is one that's trillions of times smarter then human being.

### 2.2 AI development

There is no doubt that AI is becoming the major area that affects the future global economy. Recently, KPMG surveyed 841 executives (90 of them from China) around the world and released the 2017 report on the trend of disruptive technologies. The findings of the report corroborate the view that the technology industry will continue to promote unprecedented global cross-sector and cross-sector cooperation. The next wave of AI development will have a greater development in cognitive intelligence to further simulate how the human brain learns, understands, and makes decisions and actions. The increased computing power will greatly improve data processing capacity in the coming years. AI will change the business model in each industry and unlocking huge market opportunities. If industry leaders cannot quickly solve groundbreaking technical issues, their competitive advantage will become very short-lived. In the question "What is the most important technology that will drive business transformation in the next three years?", KPMG surveyed 841 executives worldwide, 10% of respondents chose AI. Tim Zanni, KPMG's global and US TMT business chairman, said in the report that the convergence of emerging technologies, including AI, is creating new market value and replacing existing products and services. This technology is driving far-reaching changes in industry, business models, life, society and the environment. In the past decade, significant growth in data and computing power has inspired innovation in AI. Of the 841 executives surveyed by KPMG, a total of 10% believe AI will be the third most important technology driving business transformation in the next three years. Among them, Singapore accounted for 15%, South Africa accounted for 14%, Australia and Israel each accounted for 13%, while Japan was 12%, followed by India and the United Kingdom each 11%, the United States and China each 10%. AI is embedded in platforms, chips, software and a variety of smart products and devices, a phenomenon that is leading the way in business models.

According to IDC's forecast (2017-2021), revenues from the global cognitive and AI systems will reach \$ 12.5 billion by 2017, an increase of 59.3% over 2016. In the meantime, global spending on cognitive and AI solutions will continue to increase in the coming years, reaching a CAGR of 54.4% by 2020 and by 2021 global cognitive and AI system revenue will reach 46 billion US dollars. So, what industries in the next three years have the greatest potential for monetization because of AI technology? KPMG's research on this issue ranked first in financial services and technology sectors, each accounting for 11%, followed by medical / life sciences, accounting for 10%, and telecom industry accounting for 9%, ranked fourth. As indicated earlier, industries such as finance, technology and healthcare, driven by the AI technology, will have the greatest commercial potential in the next three years.

However, in general, the four industries of technology, driverless / transportation, medical / life sciences and consumer / retail sectors are most affected by this emerging technology. Of the 841 survey respondents, 15% chose to vote for technology and the remaining three accounted for 14%, 13% and 11% respectively. From this point of view, technologies bear the brunt, becoming the fastest and most thorough industry driven by this emerging technology.

Due to the emerging technologies, CEOs plan to increase their manpower in areas such as senior management, R & D and human resources departments. Among them, 50% of CEOs said the company is not yet capable of coping with innovation and transformation rapidly, and 52% are more concerned with the process of integrating cognitive and AI technologies. In the meantime, 65% of respondents considered technological innovation an opportunity rather than a threat to their company. In addition, CEOs are also expanding the scale of innovation and technology-oriented deployment of the company's core business. Forty-eight percent of respondents said they are concerned that the company's business model is 'subversive' by new entrants that are not currently considered as competitors, and that 70% of CEOs are more than ever willing to accept new cooperation. From now until 2020, CEOs also predict they will hire more people in multiple fields to support emerging cognitive technologies. Among them, more than 75% of executives are optimistic about the growth of IT. The demand for middle management talents accounts for 64%, customers and services account for 62%, and sales and manufacturing accounts for 60%. 43% still want to increase senior managers, while more than 50% of respondents said they will increase their investment in research, human resources and marketing.

**Note:** The above report originates from KPMG's original report "The changing landscape of disruptive technologies" (2017).

### 2.3 AI future trends

First, All the second-tier companies that have invested in artificial intelligence, such as Intel, Salesforce, and Twitter, are just behind companies with big data and are starting to use their data algorithms and artificial intelligence. Data transactions will exist between industry users, and algorithms and technologies are likely to be integrated. Data trading and the integration of algorithms and technologies will make artificial intelligence play a bigger role. Secondly, as large companies like Google and Facebook continue to buy smaller companies, the algorithms in the hands of smaller companies will be integrated into the core platforms or solutions of larger companies. Google acquired DeepMind, an AI firm that builds a universal learning algorithm based in London in order to gain greater business advantages than other technology companies. Facebook, on the other hand, bought Wit.ai for its own voice recognition and voice interface. It also acquired Ozlo, an artificial intelligence startup, to improve its M virtual assistant technology. Further, all of the AI companies are eager to get a huge data set in order to realize their ambitions for artificial intelligence. These companies will use crowd sourcing to obtain large amounts of data. There are many different ways to evaluate the quality and reliability of crowdsourced data so that businesses can not only reap the benefits of these data but also give consumers a guarantee. Joel Gurin, founder and editor of OpenDataNow.com, said: "We live in crowdsourcing and more and more people are willing to share their knowledge through social media." Google is getting a lot of images by crowdsourcing to build imaging algorithms. It also uses crowdsourcing to help improve service quality, such as translation, transcription, handwriting recognition, and maps. Amazon also uses crowdsourcing artificial intelligence to improve over 15,000 of Alexa's existing features.

According to CBI Insights statistics show that the acquisition of artificial intelligence company competition has begun. In 2018 we will see more mergers and acquisitions of companies for intellectual capital and talent. Third, all of the smaller companies in the fields of machine learning and artificial intelligence are likely to be acquired by large companies for two main reasons. Artificial Intelligence cannot work independently without datasets. Since large companies have a large data set, they do not have much competitive advantage for small companies. Algorithms without data have no use. No algorithm, the data is almost useless. Data is the heart of the algorithm and getting a lot of data is very important. Hod Lipson, a robotic engineer and director at Creative Machine Laboratory at Columbia University, points out that "if data is fuel, then algorithms are engines." Fourth, Large companies will open their own algorithms and tools for greater market share. Obstacles to market-based data and algorithms will be greatly reduced, and new applications for artificial intelligence will increase. Through the democratization of tools, small companies that were otherwise limited or lacked access to artificial intelligence tools would have access to a wealth of data to train and launch complex AI algorithms. Sundar Pichai, Google's chief executive, spoke about the democratization of artificial intelligence:

"The most exciting thing we can do is to uncover the myths of machine learning and artificial intelligence so that everyone can see the beauty".

Fifth, Artificial Intelligence is sure to gradually affect all vertical industries i.e. Manufacturing, customer service, finance, healthcare and transportation have been affected by artificial intelligence. Auto-driving vehicles are expected to be available in 2018. Next year, artificial intelligence will affect more vertical industries, for example: Insurance - Artificial Intelligence will improve claims processes with automation technology.

Law - Natural Language Processing Thousands of pages of legal documents can be summarized in minutes, reducing time and increasing efficiency. PR & Media - Artificial intelligence speeds data processing. Education - Development of virtual tutors; Artificial Intelligence-aided essay grading; Adaptive learning plans, games, and software; Personalized educational curricula driven by artificial intelligence will change how students and teachers interact. Health - Machine learning can be used to create more sophisticated and accurate ways to predict when a patient is experiencing symptoms. The industrial revolution almost changed everything 100 years ago, and artificial intelligence will change the world in the coming years.

Finally, everything under the banner of artificial intelligence, including machine learning and big data, is vulnerable to new security and privacy issues. Occasionally, the key infrastructure plays an important role. Security-related needs related to privacy issues, such as keeping bank accounts and health information confidential, will rely more on security research. 2018 will be a year of security and privacy issues to be solved and a year of new development. The ethical issue of artificial intelligence will also be the main focus of 2018. Ethical issues that need to be addressed include whether artificial intelligence can hurt people or whether it is beneficial to humans. Some worry that robots may replace humans, especially in areas that require empathy, such as nurses, physical therapists and police. Another issue to deal with is an autonomous weapon. Considering a certain degree of autonomous function, artificial intelligence should take control of some of the functions of the weapon, not to have complete control over it by human beings.

Although artificial intelligence has existed for many years, the artificial intelligence we know today is still in its infancy. There are plenty of hype around artificial intelligence and its applications everywhere, from autonomous vehicles to virtual personal assistants and many other technologies that require human intelligence to do their job. Although there are a large number of AI use cases, most of which are improvements to specific processes, it takes time to be successfully deployed. In addition, there are not many enterprises in the artificial intelligence industry, so fragmentation will not appear for now. The unstructured data and algorithms for handling these data will appear. The road to artificial intelligence has a long way to go.

#### **2.4 AI Impacts on society**

AI technology can improve the medical, environmental, safety and educational levels with the exciting potential to enhance human well-being. Along with that, many legal, ethical and security problems have been emerged as it blurs the lines between the digital, physical and personal arenas. In introducing AI into society, prudent regulation should be taken. Many cases already illustrate the potential of AI in solving social problems. Artificial intelligence may help the scientists to foresee the environmental dynamics; for example, Cornell University is using this capacity to predict the changes in surroundings to protect certain birds. Further, AI is applicable in a wide range of medical treatments. Through AI, Dutch government determined the best treatments for certain patient populations and reduces medical errors by using and analyzing the digital health records of patients. Las Vegas, in United States is also introduced AI technology for public health surveillance and used social media tracking system to determine the major sources of eruption. Artificial intelligence systems can also improve the efficiency and safety of public transportation as well as transportation systems. There is evidence that unmanned vehicles can reduce traffic accidents. Alibaba partnered with the Hangzhou government to streamline urban traffic with traffic lights integrated with AI technology to reduce congestion and boost traffic by 11% in selected areas. AI can also be used to estimate the energy demand, as well to manage the energy consumption. Earlier examples include Google's need to reduce the energy consumption of large data centers and the proliferation of grid systems managed by the UK government, showing the potential for AI technology to save companies and consumers billions of dollars. Along with the unique capabilities of AI, many ethical and legal issues emerged that require serious consideration. The famous Asimov's three laws of robotics are the first to attempt to establish the basic guidelines for robot-human interaction. However, ethical issues arising from the emergence of AI are subtler and potentially more influential.

First, in the ubiquitous world of sensors and AI systems, businesses continuously collect personal data - not only using digital devices but also by using public as well as personal space that raised many questions like who owns the personal data, how it can be shared, and how to protect the data from the risks of cybersecurity loopholes. Second, AI may unconsciously discriminate when making decisions. Since the "real world" is full of all kinds of racism, gender discrimination and prejudice, the real data that feed into the algorithms also have these characteristics - as machine learning algorithms learn from biased training data, These prejudices. In addition to these ethical considerations, the AIs adopted by society will also bring about many legal implications. For example, if an accident or even a crime has occurred as a result of an AI decision, who should be blamed?

Who owns the AI system to create intellectual property? For AI's powerful ability, what rules should be developed? AI developers have any legal rights and obligations. These and many others issues require a full-scale debate to create a sound legal and ethical framework.

### **3 Case study: China AI**

#### **3.1 Outline on China AI**

The significance of AI to China: China's big technology companies have promoted research and development in AI and China will become the world's leading AI research and development center. China's huge population base and diversified industry portfolio has a potential to produce a massive dataset and create giant markets. The widespread adoption of artificial intelligence technology is crucial to China's future economic growth because of an aging population across the country that has accelerated its demand for productivity growth, including an open data environment and also well-qualified data science professionals. But AI also raises more complex social and economic issues that require cautious thinking. In current era, the United States and China are the global leaders in the development of AI. In 2015 alone, there were almost 10,000 AI-related papers published in academic journals in both countries, while Britain, India, Germany and Japan together add up to about half the number of Sino-U.S. (Source: SCImago Journal & Country Rank, 2015). Most of the AI development in China is driven by private high-tech enterprises. With the help of massive dataset and diverse product lines, there are some of the China's Internet giant companies, lead the way in image and speech recognition technologies.

They have integrated these technologies into their new products, like autonomous cars, smart assistants, and more. China has a reason to be optimistic about its role in defining the AI future across the globe. China with its huge population is in a position to generate a bulk of data, that is an important requirement for "training" the AI system. China is also advantageous of "economies of scope": as diversified industrial sectors can provide a fertile ground for product deployment in the marketplace. However, in order to maintain a cutting-edge position in this rapidly developing area, China still needs to make its best efforts to maximize the potential for these underlying technologies. China needs to focus on enhancing innovation capability.

For example, although Chinese scholars publish more AI-related papers than their American counterparts, their papers have less influence than those of the United States and Britain. Although China has published a large number of widely cited AI-related papers, its influence is still greater in the United States and Britain. China comes first in the absolute citations, but the United States has more advantages after removing self-citation. In addition, China has not formed such a viable AI ecosystem as the United States, as evidenced by the fact that the United States has far more AI start-ups than China. The American AI ecosystem is innovative, diverse and large (including research institutes, universities, and private-owned companies) that have benefited from the technology industry in Silicon Valley and have the advantage of being difficult to replicate and the US AI Entrepreneurship Ecosystem is also more robust than China. A recent U.S. government report outlines AI-related work that is likely to become ubiquitous in the future, divided into four categories: Involvement in working with the AI system to accomplish complex tasks (routine nurse-patient exams using AI applications); Developing work to create AI technologies and applications (such as database scientists and software developers); overseeing, licensing or repairing AI systems (such as maintaining AI robotics); and responding to AI-driven paradigm shifts. For example, lawyers create legal frameworks around the AI or create city planners that can accommodate the environment of an autonomous vehicle.

#### **3.2 Major AI player in china**

In near future, it may possible that China will become a major player in the field of AI, as it has recognized that AI and machine learning will be the most critical factors to grab the next big areas of innovation.

In current era, Chinese investors are making heavy investments in AI-focused startups and the Chinese government also showed a desire to see the country's AI industry bloom, guaranteeing to invest about \$15 billion by 2018. In July 2017, the China's State Council revealed a guideline for the development of the AI industry, which will motivate the AI sector to compete the other advanced countries in terms of AI technology and applications by 2020. Following are the major China's AI giants that are working in the diverse fields of artificial intelligence.

### **(1) Baidu**

Often called "The Google of China," Baidu is one of the most popular search engine engaged in providing news, internet TV, cloud storage, and a ton of different search products.

Along with the core internet services, it has also branched out into e-payments with Baidu Wallet and food delivery services in over 70 Chinese cities with Waimai. Like Google, the long-term future of the company is in artificial intelligence as it has AI-focused labs and has gained the rewards in terms of developments in technologies such as natural language processing, voice recognition as well as enhanced advertising business. Further, Baidu Inc, proposed the "China Brain" project during the "2015 two sessions" - the annual sessions of the National People's Congress and the National Committee of the Chinese People's Political Consultative Conference - the central government has come up with a slew of policies to encourage the development of AI. During the Baidu's World Conference held in Beijing, Robin Li CEO of Baidu along with NVIDIA CEO Jen-hsun Huang publicized a partnership, agreed on the use of artificial intelligence to create cloud-to-car autonomous car platform for local Chinese as well as for global car makers. The partnership will combine the Baidu's cloud platform and mapping technology and NVIDIA's self-driving computing platform to develop solutions for HD maps, Level 3 autonomous vehicle and automated parking. Using Graphic Processing Units (GPU), Baidu's researchers such as Andrew Ng have achieved some of the key breakthroughs that have made the Xiandai AI boom possible. Now, Baidu has planned to use its driverless tech for the general public and will share its shuttle service in 2018. Baidu will be in a position to produce self-driving cars for private use after 2018. Baidu's focus is not only in China, but also get a license to test its autonomous vehicles in California.

Baidu has directed their all efforts toward two important technologies to boost its driverless car efforts. The first critical technology to focus on is deep learning, a branch of artificial intelligence that will give its cars an optimal image sensing and recognition. The technology allows vehicles to learn on their own so they can deduce what's around them and make faster, reactive decisions as to how to proceed. One of the Chinese tech company Inspur partnering with NVIDIA, has created a high-performance, image recognition server that the Baidu is going to use in its driverless cars. The second important technology through which the Baidu is advancing its driverless car efforts is its HD maps which play a critical role to get driverless cars road ready. The cars compare what is outlined on the map to what they're "seeing" with sensors, LiDAR, and radar in order to detect and avoid obstacles. Baidu is the Chinese leading company that produces high-resolution 3D maps of routes. Its high-precision mapping data contains hundreds of properties, and it is precise down to the centimeters.

Baidu has also introduced a translation services APP in August 2017 that works in partnership with China-based travel agency Ctrip. The Chinese can get instant translations by taking photos, using voice recognition or texting characters. Baidu opened up an AI Research and Development (R&D) lab in Silicon Valley and has achieved remarkable results on Deep Learning. The Chinese company has also made significant progress on OCR (optical character recognition). OCR, via AI, can view an image through a smartphone and translate it into Chinese characters. The APP is even easier to use for those who had formerly relied on electronic dictionaries. In such instances, they had to type in English language characters before they could receive the Chinese translation. The most popular used computer-generated translation service worldwide comes from Google. But Baidu has introduced new upgrades in OCR which can translate 27 languages into Chinese with nations that have close ties with Beijing. Baidu Translate is based on deep learning technologies, a completely different method from the most popular open source phrase-based machine translation system which performs much better. The Baidu Translate Team had embedded Deep Learning technologies into a machine-based translation system, while adding statistical systems to improve translation quality.

Baidu is also making an inspiring advancement, particularly with the accuracy of its voice recognition technology, and its conversational interfaces will become reliable enough to be used for interacting with all sorts of devices. For example, robots or home appliances could be easier to deal with if you could simply talk to them.

Baidu's research teams at its Beijing headquarters and at a Silicon Valley are devoted to advance the accuracy of speech recognition and also working to make computer better at describing the meaning of sentences in a meaningful way. Baidu's team has reached at an important breakthrough with its voice technology, and announce that its Silicon Valley lab had developed a new powerful speech recognition engine termed Deep Speech 2, which consists of very large, or "deep" neural network that learns to associate sounds with words and phrases. The engine is fed millions of examples of transcribed speech and it can recognize spoken words with a stunning accuracy.

## **(2) Alibaba Group Holding Ltd.**

The Chinese tech giant that's perhaps best known across the English-speaking world is Alibaba, the world's largest e-commerce company. China is the world largest e-commerce market because it doesn't have a retail infrastructure to match the US or Europe, and Alibaba has built B2C, C2C, and B2B platforms to serve it. It's best-known for Taobao, its eBay-like C2C platform, but it also has B2C platform called Tmall, online payment service Alipay, and B2B cloud computing platform Aliyun. Furthermore, Alibaba recently launched eight new research bases in China, Israel, the US, Russia and Singapore. It is hiring 100 researchers to work on AI, quantum computing and fintech.

Alibaba announced that it plans to increase its expenditure on R&D (research and development) to an eye-popping \$15 billion over the next three years. The initiative has been nicknamed the Alibaba DAMO (discovery, adventure, momentum, and outlook) Academy. Alibaba said that the academy will help serve as many as two billion customers and help create 100 million jobs globally over the next two decades. The company has already spent over \$2.6 billion on research and development for the 12-month period ending June 2017, according to the company's filings, and the company's spending on R&D has surged over the past few years. The company hopes to keep pace with the likes of Amazon.com, which spent a whopping \$16 billion on R&D during the same period.

## **(3) Tencent**

Sometimes referred to as the "Facebook of China," Tencent was long known for its instant messaging client QQ.com, with over 200 million users. However, Tencent's successor to QQ, WeChat, has become the world's second largest social network behind Facebook and it is growing like crazy. WeChat has exploded from its launch in late 2010 to over 200 million users by 2013 and 700 million users in 2016. Tencent has opened an AI lab last year, and the company was busy recruiting talent at NIPS. Over the past six years, Tencent has accumulated more than 13 million partners like software and application developers, created 25 million jobs and paid 23 billion yuan in dividends. Tencent Holdings has unveiled a multibillion-yuan plan to support start-ups while encouraging integration of AI technologies with traditional industries. Tencent's AI lab has made significant progress in recent years, and the applications it developed have spread to various sectors such as social networks, medical services, retail finance and security products.

Element AI, a Canadian artificial intelligence company backed by China's Tencent Holdings Ltd., has raised US\$102 million in new funding from a number of Canadian and Asian funds and investors. Tencent is a significant investor in Element AI, says the statement without specifying when and how much Tencent invested in the company. "Tencent is actively pursuing investment opportunities in AI and innovation globally," said Hongwei Chen, executive director of investment and M&A at Tencent. "We are excited to partner with Element AI and Real Ventures, and look forward to seeing breakthroughs in AI technology and applications that help improve people's lives.

Tencent Holdings Ltd inked a strategic partnership with leading science publisher Springer Nature in an effort to encourage young scientists to make breakthroughs on science and technology. "Technological development and innovation are keys to solving a series of problems that human beings are confronting," said Cheng Wu, vice-president of Tencent. "Young scientists are the hope for such breakthroughs and also one of the groups in great need of help." According to the deal, Springer Nature, home to some of the best-known names in research, educational and professional publishing, will unearth and encourage potential young scientists with a strict examination system, while Tencent will be the supporter. Both sides will also work together to help those young science and technology leaders to connect with industries, helping them transform scientific and technological achievements to drive the real economy. In addition, Springer Nature will officially become a partner of Tencent's We Summit, an annual gathering where luminaries share advanced ideas on science and technology.

AI is an essential technology and a strategic initiative for Tencent, supported by the continual research and development, and the creation of the Tencent AI Accelerator which helps startups flourish and grow through access to Tencent's AI breakthroughs and by building on its platforms. There are thousands of startups that have participated in the program since the AI Accelerator was launched. Tencent AI Accelerator has empowered many other industries through cooperation with these emerging AI startups. As per mobile internet becomes ubiquitous, Tencent's open platform strategy discourses the recent emerging value of digital content. The underlying strategy is designed to enable and support a full content ecosystem, including content production, multi-channel construction, intelligent distribution and commercialization.

### 3.3 Telemedicine and healthcare transformation in China

The China's population stand about 1.4 billion and some studies proclaimed that a rising number of Chinese have been diagnosed with chronic illness that requires extensive treatment for a long duration of time, which may include regular doctors' visits, therapy sessions and adhering to prescription medication regimens. In this scenario, telemedicine could renovate the quality of healthcare for urban as well rural residents while minimizing medical costs, as well as reducing over-crowded conditions at 'Big City' hospitals. Telemedicine can be defined as e-Health, a process of delivering health resources and healthcare through electronic means; the use of telecommunications and information technology to provide clinical solutions to patients via smartphones, emails, two-way video conference calls and other wireless devices, such as wearable and Wi-Fi-connected bio sensors.

In China telemedicine market, the top three AIgiants leading the e-Health sector are referred to as BAT; Baidu Inc., Alibaba Group and Tencent Holdings. Baidu has made numerous advances in artificial intelligence to deliver AI-assisted doctors and nurses to patients through mobile APPS. Further, Alibaba has introduced a number of telehealth products and opened up digital hospitals that connect patients with healthcare providers through video conferencing sessions. Meanwhile, Tencent has utilized Big Data with its WeChat Social Media platform to crunch the numbers on regional public health conditions and provide reports and sell them to pharmaceuticals, medical institutions and government agencies. These three leading companies have a critical role in the development of telemedicine that will change the traditional ways and will transform the healthcare industry of china.

### 3.4 China's Smart City Vision

China's cities are about to undergo a fundamental transformation. Within the next year, the country will see the commercial deployment of Mobile IoT, the new low power wide area (LPWA) network technologies in licensed spectrum composed of LTE-M and NB-IoT. Backed by all three of the nation's mobile network operators, China Mobile, China Telecom and China Unicom. NB-IoT, like other Mobile IoT technologies, is unique for its ability to support devices requiring low power consumption, extended coverage, low cost and high security, and as such, can service a city in many ways. Having completed over a 60 pilot schemes across China and elsewhere in the last 12 months, Mobile IoT has already demonstrated its crucial role in enabling next generation utility meters, smart parking and multipurpose, intelligent street lighting. For example, cities equipped with Mobile IoT will be able support utility companies looking for deeper indoor coverage, lower power consumption and lower cost modules than conventional cellular technologies. As a result, we can expect a strong demand from water companies for metering, pipe network monitoring and water quality monitoring services, which can help them to manage their infrastructure and upgrade their services, while reducing operating costs.

Mobile IoT's ability to deliver higher quality services and save on operating costs across many sectors have led to widespread predictions of its rapid growth. For example, Machina Research IOT forecast 14 million Mobile IoT connections in 2017, exploding into 862 million connections by 2022, which, by this time, will account for over half of the total LPWA connections across the globe.

The analyst firm estimates 192 million LPWA connections in China by 2022, with the connected home, business and utilities sectors accounting for the most connections, with 59 million, 44 million and 31 million, respectively. The expected boom of Mobile IoT connections is borne out by ongoing reports of technology's role in the development of smart cities in China. For instance, according to C114, NB-IoT underpins the 'intelligent' Yingtan City; a 'template' city with more than 10 NB-IoT use-cases including widespread smart parking, urban equipment management, industrial controls, agro forestry monitoring and intelligent transport systems. ABI Research report that various countries in East Asia will lead the way in the deployment of smart city initiatives in Asia.



Singling out China –and its adoption of NB-IoT- as the region’s catalyst, ABI Research estimates that China smart meter installations and smart parking to undergo rapid growth in the near future. The strong confidence in Mobile IoT is reflected in its large and growing ecosystem of module makers and device manufactures, all prepared to support all-manner of businesses. Wholesale Mobile IoT deployments, such as that of the Yingtian City initiative, are made easier when supported by both local and national governments.

## **4 Conclusion**

### **4.1 Discussion**

The developments in the field of artificial intelligence will dramatically influence the human life, society and will change the world.

Artificial intelligence is a strategic technology that will become a pivot of international competition and will lead in the future. In most of the world’s developed countries AI has become a focal point and are taking this technology as a key approach to protect national security and to enhance its competitiveness. The world’s developed countries are in a quest to grab the initiative in the new round of international science and technology competition. In current era, Chinese position is more complex with regard to national security and international competition. Chinese government as well as the tech industry is directing his attention on AI and taking advancement of AI in its national level strategies through a systemic layout so that it can grab the strategic initiative of new round of international competition in AI development. By opening up the development of new space, China is creating new competitive advantage to protect the national security effectively.

AI will become a new engine of economic development and will play a critical role in industrial revolution and will release a huge energy stored from the earlier technological revolution. AI will play a major role in the reconstruction of production, distribution, exchange and consumption pattern. With the development of AI, China’s economic development will enter into a new era. China will accelerate the rapid application of AI and will cultivate and expand its AI industries to add new energy into its industrial and economic development and will also bring new opportunities for the development of social structure. Currently, China is in decisive stage of constructing a moderate prosperous society. The widespread use of AI in education, judicial services, urban operations, medical care, and environmental protection and in the other fields will positively influence the level of precision in Chinese public services and will enhance the standard and quality of life.

China enjoys a promising foundation for AI development and it has deployed National Key Research and Development Plan’s special projects, such as smart city and intelligent manufacturing. The nation has also implement AI Three-Year Activities and Implementation Program, that will release a series of measures like science and technological research and development, promoted applications, industrial development, and other aspects. Resulting in the years of continuous growth, China is reaping the rewards in the form of; important breakthroughs in certain domains of critical technologies; developments in the field of AI with the number of international scientific and technology papers published and a number of inventions patented ranked second in the world. China will become a world leader in visual recognition and voice recognition technologies and it also possess the ability for leapfrog development in adaptive autonomous learning, comprehensive reasoning, intuitive sensing, hybrid intelligence and swarm intelligence. In the state, intelligent monitoring, information processing, industrial robots, biometric identification, service robots, and unmanned driving are entering in the practical application. China will become an AI innovational and entrepreneurial state, as a number of Chinese AI giant have accelerated their AI growth and have receive a widespread recognition internationally. Accelerating the accumulation of massive data resources and technological capabilities together constitute China’s unique advantage in AI development.

### **4.2 Suggestions**

Turning today's technological innovations into China's long-term engine of sustainable growth requires a deliberate strategy. The government should lay a solid foundation for the development of AI to provide enlightening goals to stimulate private innovation and new technology applications. The strategy consists of a strong industrial and economic framework, an educational framework and a social and international policy framework. Although the development of AI is still at an early stage, it seems unlikely that technology will follow the path of linear growth.

The possibility of a quick launch there is an urgent need to ensure sound industrial policies otherwise, China will face the risk of favoritism, over-supply and over-investment that will undermine the values. While the market will drive the development of AI technology and its applications, the right policy framework can create a healthy environment for growth.

#### 1. Establish a sound data ecosystem

Rich data is a key element in accelerating innovation, attracting talent and training AI systems. Implementation of data standards, opening up of public data for individual research and development and encouraging the exchange of international data streams could be helpful to China to build a strong data ecosystem. Data Standardization is an imperative predecessor to the system's extensive data sharing, as well operational interoperability that will enhance the value of IoT and AI technologies. Given the huge amount of data available across the country, China has a strong position to take the lead in ensuring that Chinese data standards are implemented and expand the adoption of AI in traditional industries in China.

#### 2. Strengthen the delivery of professional AI talent

In order to fill the gap between the AI talent in China, the Chinese government required to make investment in AI-related research programs and education, relocate the entire education system and pay more attention to digital and innovative skills, formulate resettlement policies that can attract the best talent in the world. In order to train more computer scientist elites, this technology needs to be advanced and the government can invest in the creation of artificial intelligence programs and fund artificial intelligence research laboratories at leading universities. This may include establishing artificial intelligence centers in top universities in China, or sponsoring innovative research centers to foster cooperation between universities, research institutes and private companies.

#### 3. Create alternate employment opportunities

It is sure that some work may disappear after the emergence of key technologies. Most of the typists, darkroom film scrubbers and telephone operators have been disappeared for the sake of the obsolescence of these jobs by technology. Helping the most affected sectors of the workforce will be a critical challenge in the maintenance of social stability and public welfare. Chinese government need to take special initiative to identify the jobs that are most likely to automate and ensure that retraining programs are provided to the workforce of that jobs are at risk. Chinese government should focus on development of labor skills that are relevant to AI in the long run, so that more people can work with AI technologies in a variety of business and professional environments.

#### 4. Establish ethical and legal framework

Establish an ethical and legal framework is particularly important in the development and adoption of artificial intelligence in a number of legal areas, such as the privacy protection and liability of driverless vehicles. China's legislature needs to provide a framework to eliminate legal uncertainty. After establishing an ethical and legal framework, the government needs to establish a regulatory agency that oversees AI activities. At international level, China is in a position to lead in setting up a council to promote an inclusive, peaceful and sustainable development of AI technology. China can also share its AI techniques and technology with other countries to form an AI-Belt and Road Initiative. Besides, China can also lead the international cooperation in the supervision and development of AI technology and to ensure that this emerging technology makes a positive contribution to the universal well-being of all mankind.

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