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RESEARCH AND DEVELOPMENT

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AI'S LONG AND WINDING ROAD

How China aims to lead R&D in the industries of tomorrow

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R&D IN CHINA: RACING FORWARD BUT WITH HURDLES AHEAD

Climbing up the value chain, by boosting innovation capacity, is a key part of China's national strategy to shift from a quantitative to a qualitative focus on the economy. An estimated United States dollar (USD) 279 billion was spent in China on research and development (R&D) in 2017, a 14 per cent year-on-year increase.[1] The European Union Chamber of Commerce in China's (European Chamber) *European Business in China Business Confidence Survey 2017* found that 23 per cent of respondents already consider China's R&D environment to be more favourable than the worldwide average, an eight per cent increase from 2016. European enterprises must carefully weigh the pros and cons of either establishing R&D operations in China, or expanding what they already have.

Foreign-invested enterprises (FIEs) with R&D operations in China traditionally have focused on product localisation. However, the increasingly sophisticated demands of Chinese consumers and greater capacity for innovation has driven more FIEs to expand their local R&D operations. Furthermore, China is quickly taking the lead in technologies like artificial intelligence and big data, making local R&D centres valuable to FIEs that want to keep pace with their domestic counterparts. New business models and the successful integration of legacy technology for use in new and creative ways have put China on the forefront of technological development. Finally, local talent in China is better educated and more well connected than ever before.

However, there are significant challenges that bar many FIEs from entering the Chinese R&D landscape. The European Chamber's *European Business in China Business Confidence Survey 2017* found that the three largest issues for FIEs looking to enter China's R&D environment were the availability of talent, intellectual property (IP) protection and ease of accessing internet services.

Concerns over the availability of talent may seem contradictory given the innovativeness being demonstrated by so many locals, but this is chiefly a matter of supply and demand. Competition over talent is fierce and it can be difficult to hold onto the most skilled and creative minds. European enterprises must tackle this competition head on by exceeding expectations set by R&D experts. With the widening scope of R&D, the domestic talent pool may still be insufficient. The new work permitting process, updated in April 2017, makes it easier to bring in top-level foreign talent, but is now even stricter on those who fail to qualify as 'top talent'.

Earnest efforts have been underway in China to improve IP protection, but there is still a long way to go. The IP courts that have been a boon to IP protection in Beijing, Guangzhou and Shanghai will soon be extended to Chengdu, Nanjing, Suzhou and Wuhan.[2] China's IP laws are steadily improving, however European businesses should not underestimate related risks, particularly with the rise of cyber espionage.

The state of the Chinese Internet remains a major impediment to FIEs engaging in R&D. While many parts of doing business in China have recently improved, the Internet has not. Due to internet strictures, a lack of easy access to outside information has impeded businesses' ability to effectively engage in R&D. Even with a licensed virtual private network, many companies still struggle to properly connect to their home offices to carry out vital company operations.

European businesses looking to establish or expand R&D operations must also take local policies into consideration. In 2017, members of the European Chamber found South China (Guangzhou and Shenzhen), Beijing and Shanghai to have the best environments for R&D.

This issue of *EURObiz* examines many of these issues in detail. A wide variety of experts in a broad range of industries have contributed their thoughts on the current situation. Opportunities and threats alike abound in China for those looking to conduct R&D and these experts offer their knowledge to help readers best navigate this increasingly crucial aspect of business.

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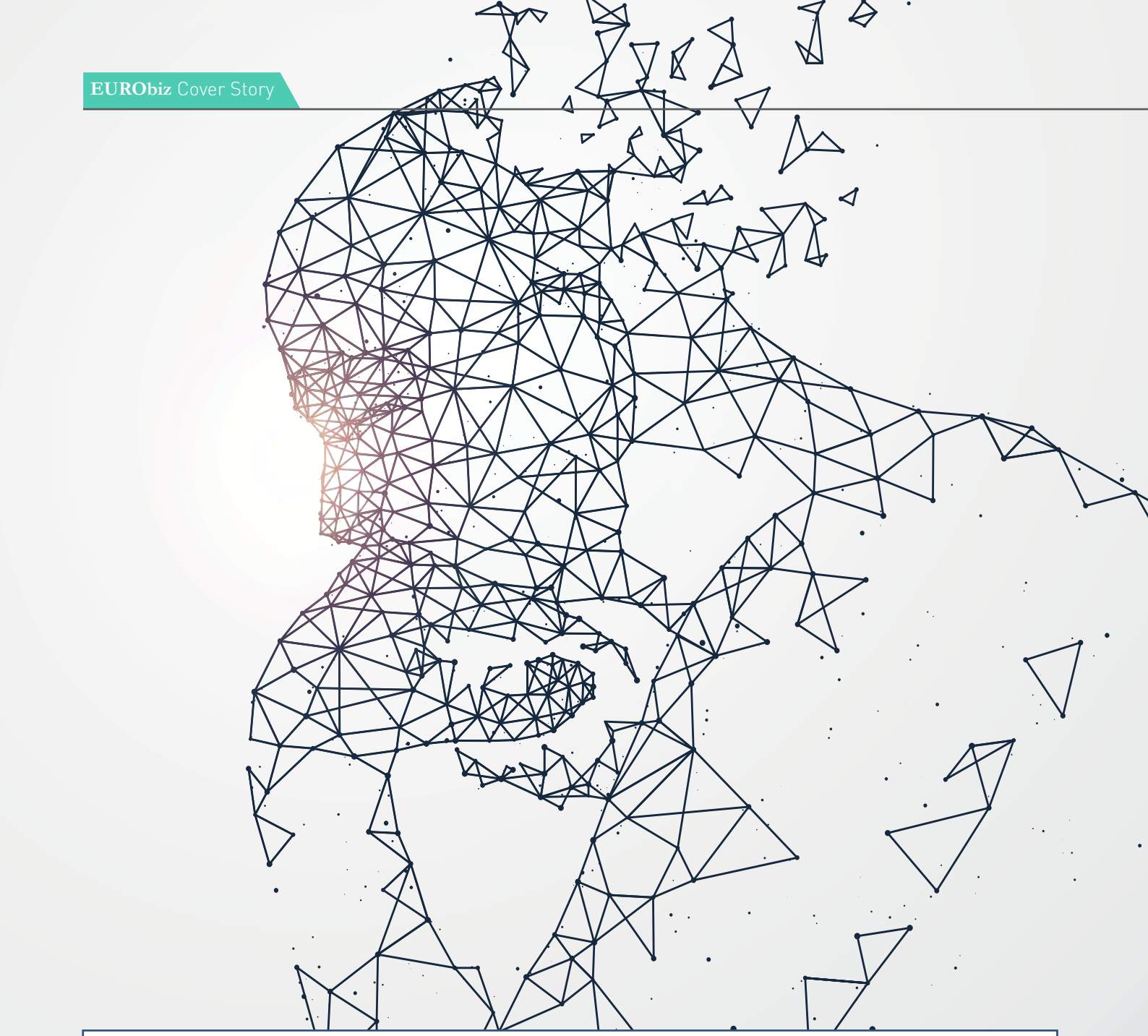
1 *China Spends $279 billion on R&D in 2017: Science Minister*, *Reuters*, 27th February 2018, viewed 19th March 2018, <https://www.reuters.com/article/us-china-economy-r-d/china-spends-279-bln-on-rd-in-2017-science-minister-idUSKCN1GB018>

2 Chen, Crystal, *New Intellectual Property Courts to be Established in Nanjing*, *Suzhou*, *Chengdu and Wuhan*, Tsai Lee & Chen Patent Attorneys & Attorneys at Law, Lexology, 9th May 2017, <https://www.lexology.com/library/detail.aspx?g=ba2cb3c8-b64f-4195-a63b-2ec0d6feb482>



AI'S LONG AND WINDING ROAD

How China aims to lead R&D in the industries of tomorrow

China is emerging as a global leader in research and development (R&D). This is thanks to Beijing's foresight in creating regulatory frameworks and policy ecosystems that stimulate R&D in 'next-generation technology sectors', something that especially rings true for artificial intelligence (AI). **APCO Worldwide** analysts **Kaj Malden** and **Caroline Meinhardt** show that China's push for AI development reflects an evolution in Chinese industrial policy implementation and a sober awareness of the gaps in its development.

Ambitious plans and abundant cash

China is increasingly considered an innovation hub and global leader in R&D. In recent years, China has consolidated its efforts to become the global front-runner of next-generation technology. Chinese R&D investment has grown at an average annual rate of 11 per cent, and the country's R&D intensity (R&D expenditures as a percentage of gross domestic product (GDP)) reached 2.1 per cent in 2016, narrowing the gap with the Organisation for Economic Co-operation and Development countries' 2.4 per cent average.

These numbers reflect the growing strength of Chinese innovation in cutting-edge technologies and suggest that the often-told narrative of China being a nation comprised of 'copycats' is rapidly changing. Nowhere is China's push for technological innovation more visible than in its support for AI technology. For Beijing, Chinese innovation in AI will enable the country to transform traditional industries like healthcare and education and become a pioneer in autonomous vehicles and robotics.

This opportunity has driven China's leaders to push for increased AI R&D. In the work report Premier Li Keqiang delivered this month at the 13th National People's Congress, he called for the Party to advance economic growth by "stepping-up next-generation artificial intelligence R&D and application", to "transform and upgrade traditional industries" and move China closer to becoming "a country of innovators".

Premier Li's call to action echoes Beijing's wider goal to move up the industrial value chain in high-technology sectors, a goal that has been repeated often by President Xi Jinping. This goal has gained immense momentum since the announcement of the China Manufacturing 2025 (CM2025) initiative in 2015. For Chinese policymakers, technological innovation in areas like AI is key to achieving "national rejuvenation".

This top-down approach is nothing new in China. Beijing has long made use of state-led industrial policy to drive economic development, historically combining central planning with hefty state financing. The question is whether this approach will do for next-generation technologies, such as AI, what it has done for China's successful efforts in high-speed rail and aviation infrastructure.

The answer is a mix of yes and no. PricewaterhouseCoopers estimates that the sector could contribute approximately United States dollar (USD) 7 trillion to the Chinese economy and account for 26.1 per cent of its GDP by 2030. Yet, unlike the construction of high-speed rail, the success of AI development hinges in part on the viability and performance of the private sector, which has been investing in, researching and developing this technology for some time.

Seeking global leadership

For China's policymakers AI provides an opportunity to be a global leader in a nascent form of technology. Rather than trying to catch up to the West, China enjoys several structural advantages when it comes to spearheading AI development.

First, China has unparalleled amounts of data and data fuels AI applications. China has nearly double the number of internet users as the European Union (EU), with 800 million netizens using online applications (apps) such as WeChat and Alipay to do everything from ordering food to sharing bikes. Information collected by these apps are easily available to companies and regulators due to weak government restrictions on data privacy and sharing.

Second, Chinese tech giants like Baidu, Alibaba and Tencent are driving innovation through sizeable investments in their own research departments. The number of innovative, AI-related start-ups has surged in recent years, supported by a well-funded and active venture capital ecosystem. The success of companies such as Didi, Toutiao, Face++ and iFlytek demonstrate that China is now a source of ground-breaking technology.

Third, and most crucial, the Chinese Government is supporting AI R&D. In July 2017, the State Council of the People's Republic of China (State Council) released the national *Next Generation AI Development Plan*. While this did not constitute the first mention of AI in a Chinese policy document, it was the first plan dedicated to AI that outlined China's strategic vision for this technology. This plan has been followed by a series of related polices and guidelines. It calls for China to become a global leader in AI and the world's primary innovation centre by 2030, detailing a variety of sub-sectors where different AI applications should be pursued.

This comprehensive strategy helped illuminate China's top-down approach to industrial development. Becoming a leader in AI is central to Beijing's wider ambition to become a "world class technology and innovation country" – an ambition pronounced in the *13th Five Year Plan* and consistently reiterated in reports presented by President Xi and Premier Li.

However, Chinese leaders also recognise that basic research in AI needs to catch up with work being done by foreign counterparts. In response, the central government has launched a variety of AI-related R&D programs in the pursuit of bolstering development. Provincial and municipal governments are following suit with their own big announcements, such as Beijing's planned renminbi-yuan (CNY) 13.8 billion (approximately euro (EUR) 1.76 billion) AI development park.

Many analysts predict that this powerful combination of expansive data, financial firepower and government backing will help the country win the global AI 'race'. Despite this prediction, a lack of government support for R&D, an anaemic domestic talent pool and absence of appropriate infrastructure will take time to correct. Most AI applications in China still rely on imported hardware. Additionally, Chinese universities still only have a handful of specialised AI academic programs that could improve the country's R&D.

More importantly, China's investments in AI-related R&D have been driven by China's private sector, not the government. China's tech giants have been spearheading innovation in cutting-edge technology, including AI, since 2009. Government support for the sector will only be as valuable as the amount of expertise already employed by China's tech giants. At the same time, those tech giants are beholden to the central government's will and have added incentive to align AI development with the government's national goals.

Realistic about strengths and weaknesses

China appears to be innovating its industrial policy by testing different ways to promote R&D in AI. Chinese governmental support for AI focuses more on creating mechanisms for guiding and coordinating AI development rather than mandating targets companies must reach. Recently established implementation offices and advisory committees led by key government ministries, such as the Ministry of Science and Technology of the People's Republic of China, bring industry, academia and government together under one unifying mission.

At the same time, China admits to its own shortcomings. These AI-related policy plans are forthright in acknowledging development gaps in China's R&D and providing solutions that address them. For instance, China recently provided preferential visa terms in order to attract global talent in AI for Beijing's new research park. With this new talent attraction program, coupled with plans to build national labs for basic research, China is making it clear that it understands what its weaknesses are. Because of this, China's forthrightness and ambition could see the country overcome its AI shortcomings in the near future.

China also demonstrates foresight regarding the challenges that come from making AI advances. The *Next Generation AI Development Plan* calls for the creation of a regulatory framework to govern AI development and application. While this regulatory framework might contrast with models preferred by the West, at the moment China is one of the only countries driving policy conversations concerning AI governance. Similar efforts have been made by China in other emerging and hard-to-govern technologies, such as the inaugural Global Cross-Border E-commerce Conference earlier this year.

China's ambition and push to lead the creation of mechanisms governing AI development spells different things for the European business community in the short and long term. In the short term, opportunities to share expertise and technology could enable EU businesses to engage with Chinese regulators during the AI standard setting process. This dialogue is essential, given China's push to play a global leadership role in AI standard setting, and because of its importance, Europe should try to be a part of the deliberations. Additionally, China's supportive ecosystem for AI development is unique and in need of expertise, which European businesses could provide. In doing so, EU companies could benefit from that ecosystem by developing and testing their own technologies in China's fast-moving market.

However, in the long term, European businesses need to be aware of China's shift towards indigenous innovation in technology. Long-term policy prescriptions, like those made in CM2025, are explicit in their calls for domestic champions in high-tech sectors. Recent anti-trust investigations into companies like Microsoft and Qualcomm hint at European firms that operate in China being put at a strategic disadvantage and even being pushed out of the market. In Europe, AI-related firms are at danger of having their talent and technology poached or bought out by Chinese investments.

It is too soon to predict China's AI success. Previous state planning efforts hint at the possibility that China's AI development will be speedily developed at the expense of wasted resources. Despite these concerns, it is clear that China has the ambition and momentum to succeed in AI. With the possibility of President Xi leading China beyond 2023, European businesses would be wise not to question Beijing's burning drive to succeed. Eb

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INNOVATIVE AI APPLICATIONS IN CHINA

Have commercial applications of AI technology matured?

Based on recent calculations, by 2030 it is estimated that artificial intelligence (AI) in China will have generated renminbi-yuan (CNY) 600 billion by cutting costs and increasing revenue, all due to advances in technology once thought impossible. In the automotive industry, AI breakthroughs in self-driving cars will increase this number by CNY 500 billion. Healthcare is expected to save CNY 400 billion and in retail, Roland Berger estimates that AI will bring in approximately CNY 420 billion. Exploring these developments, **Elvie Lahournere**, from **Roland Berger**, dives deep into China's AI-based commercial applications.

In June 2017, the Chinese Government published a new version of the *Artificial Intelligence Development Plan*, which pushed this industry's domestic development to new heights, venture capitals warmly welcomed AI.

China has been making substantial headway in AI industry development, due to large domestic demand and large amounts of investment capital. Beijing, Shenzhen and Shanghai are among the top cities in the world where AI enterprises and talents gather. Chinese AI has also started penetrating other major industries throughout the country and having a large impact on domestic production as a whole.

1. Background on artificial intelligence

Introduction

By using computers, AI attempts to simulate human behaviour and over time adopt human mannerisms such as autonomous learning, judging and decision-making.

The origin of today's AI wave

Recently, the AI market, along with investment, has been rapidly increasing. This all seems to point to both the marketplace and society at-large acknowledging and putting their confidence in this industry. What has led to this technology's recent acknowledgement is the improvement in its data collection, algorithms and raw computing power. This makes it possible for AI to generate real business value.

Chinese AI enterprises now lead global AI development, with the help of an immense amount of talent, a large market and strong support from venture capital. China is the second largest AI market, only surpassed by the United States (US), in terms of the number of enterprises, patents and financing. In China, approximately 50 per cent of AI companies focus on machine vision, service robots and natural language processing. As the gathering place of AI innovation, almost 80 per cent of these companies have their base of operations in Beijing, Shanghai and Shenzhen.

2. The status quo of commercial applications

From a quantitative perspective, by 2030 AI will have generated CNY 10 trillion in growth by helping to drive other industries forward. According to Roland Berger's calculations, traditional industry sectors that will be influenced most by AI will be the finance sector, the automobile sector, the retail sector and the healthcare sector. In the financial industry, Roland Berger estimates that AI applied to risk management, asset allocation and investment consulting will reduce costs by CNY 600 billion in revenue. In the automotive industry, AI applications in self-driving technology will bring about CNY 500 billion in revenue. In healthcare, AI will increase the R&D success rate in pharmaceuticals and offer auxiliary diagnosis, as well as supplementary care, in medical institutions. In view of these improvements towards providing more efficient service, it is estimated that in the healthcare industry AI will reduce costs by CNY 400 billion. In retail, AI applications will improve online sales and at the same time reduce inventory costs

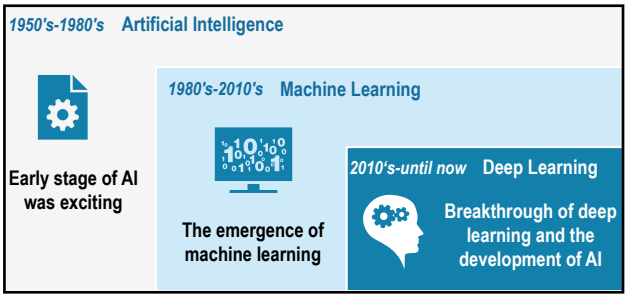

Figure 1: The relationship between AI, machine learning and deep learning
Source: Roland Berger

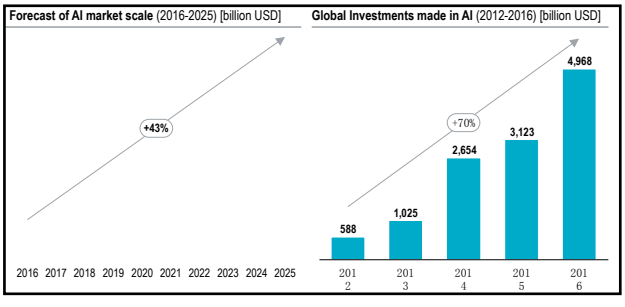

Figure 2: Forecast of AI market size and Global Investments made in AI
Source: Forrester; Transparency Market Research; Roland Berger

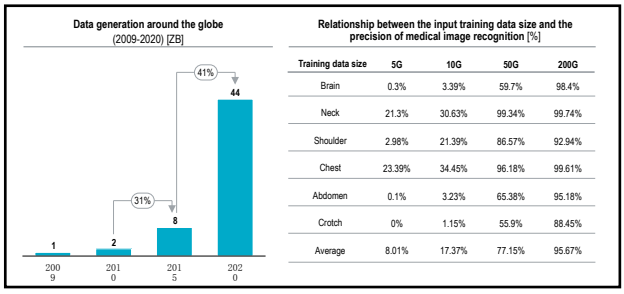

Figure 3: Performance of global data increments and AI models with different amount of input data
Source: Harvard Medical School; Roland Berger

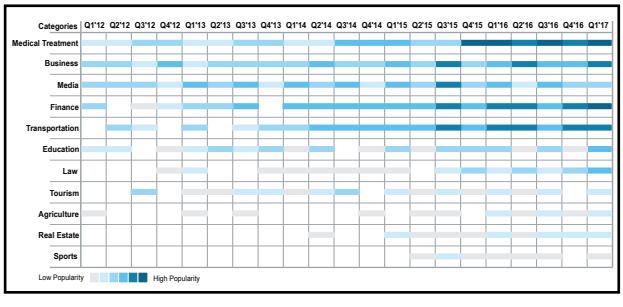

Figure 4: The popularity of financing among global AI enterprises

by providing a more precise market forecast, which through a combination of cutting costs and increasing revenue will lead to a CNY 420 billion surplus.

2.1 Overview of AI's maturity and potential when applied to different industries

As seen below, we have outlined different industries' development potential:

This technology is undoubtedly playing an important role in industries that have a mature foundation and high market potential such as the automobile, consumer, retail, finance and healthcare industry.

3. AI industrial applications in the healthcare industry

Precision-based marketing in medical cosmetology and dentistry, based on sales forecasting

In medical cosmetology and dentistry, data containing customers' shopping experience, age, transaction volume and daily habits can be analysed and matched intelligently utilising AI.

Alcon pharmaceuticals uses a data acquisition tool to integrate online and offline data from new and old VIPs, and with that information they can craft 360° portraits of those individuals. This has helped Alcon increase their number of WeChat followers by 10,083 and on Weibo by 10,147. The business's interaction with followers on social media increased by 1.4 million. The active rate of Alcon's VIPs increased from 12 per cent to 78 per cent, while the offline growth took up 39 per cent of the whole.

Auxiliary diagnosis driven by data

Machine learning algorithms can help with auxiliary diagnosis. Auxiliary diagnoses that utilise AI can analyse a patient's data and then using a large amount of background medical information, be able to recommend a diagnostic technique or prognosticate on the illness. As for precision, with the help of medical experts AI has the ability to surpass human doctors in the fields of cardiovascular disease, cancer, neurology, and ears, nose and throat (ENT).

When it comes to AI auxiliary diagnoses, the IBM Watson question and answer computer system has had the most success. Within 17 seconds, IBM Watson was capable of reading 3,469 medical books, 248,000 papers, 69 therapy plans, data from 61,540 experiments and 106,000 clinical reports.

Medical image analysis

The application of AI in medical imaging mainly consists of two parts. In the first part, the perception stage, machine vision is used to recognise medical images and help doctors reduce the amount of time it takes to read film, which can improve efficiency and reduce the error rate. In the second part, the learning and analysis stage, image and diagnosis data can be used to train an AI's neural network model and equip it with a diagnostic ability.

A success case in medical imaging is the AI system developed by the Beth

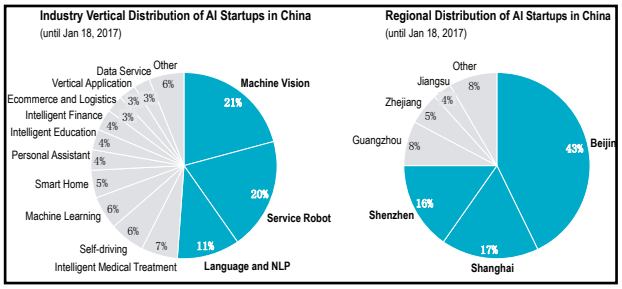

Figure 5: Industry and regional distribution of AI start-ups in China
Source: iMedia Research; Roland Berger

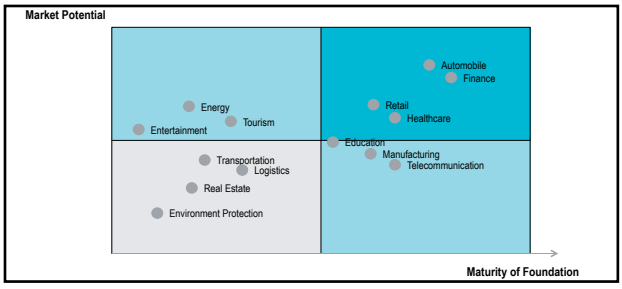

Figure 7: Evaluation of AI development foundation and its market potential in different industries
Source: Roland Berger

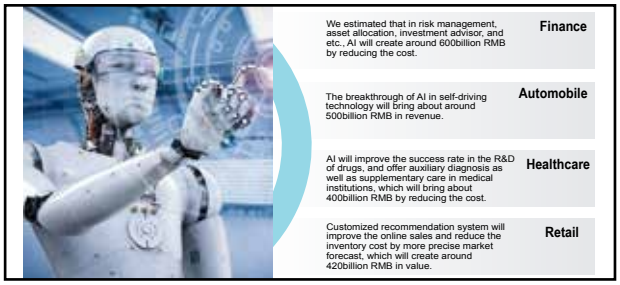

Figure 6: Quantitative conclusion of the value created by AI in different industries
Source: National Bureau of Statistics; Roland Berger

Israel Deaconess Medical Centre (BIDMC) and Harvard Medical School. This system has been able to detect cancer cells in breast cancer images 92 per cent of the time. In cooperation with pathologists, this success rate could easily reach 99.5 per cent.

4. How can enterprises take advantage of AI?

The current situation for AI is similar to the Internet in the mid-1990s. Currently, Google, Facebook, Amazon, Alibaba, Baidu, and other internet giants are developing AI technology either by acquiring start-ups or by establishing their own labs. Meanwhile, leading companies from different industries are actively investing, purchasing, developing and researching various AI application scenarios. Right now, is the time to start investing and developing AI.

General strategy for enterprises interested in developing AI

Advice #1: Build-up particular departments or teams, eliminate barriers to acquiring resources and information between organisations and implement AI as soon as possible.

Advice #2: Encourage innovation inside the company and accelerate AI development with a focus on capital operation.

Advice #3: Provide long-term AI training for employees.

In the end, the most important advice is to start accumulating data as soon as possible.

This technology will bring new possibilities to all industries. Apart from reducing costs and increasing revenue, new business patterns will also emerge. Although there is still a long way to go for AI, with recent improvements in narrow artificial intelligence the influence of AI on different industries will only grow with time. Only those companies that have already started accumulating data, talent, the necessary software and hardware can become the future leaders in AI. At the same time, all industries should cooperate with technology companies to explore AI's possible applications and accelerate its use in daily operations.

As for AI technology and solution providers, they should also be commercially oriented. By keeping the focus on providing opportunities for businesses, AI can grow healthily and sustainably. Eb

This article is an excerpt from a more comprehensive Roland Berger study on AI's application in China.

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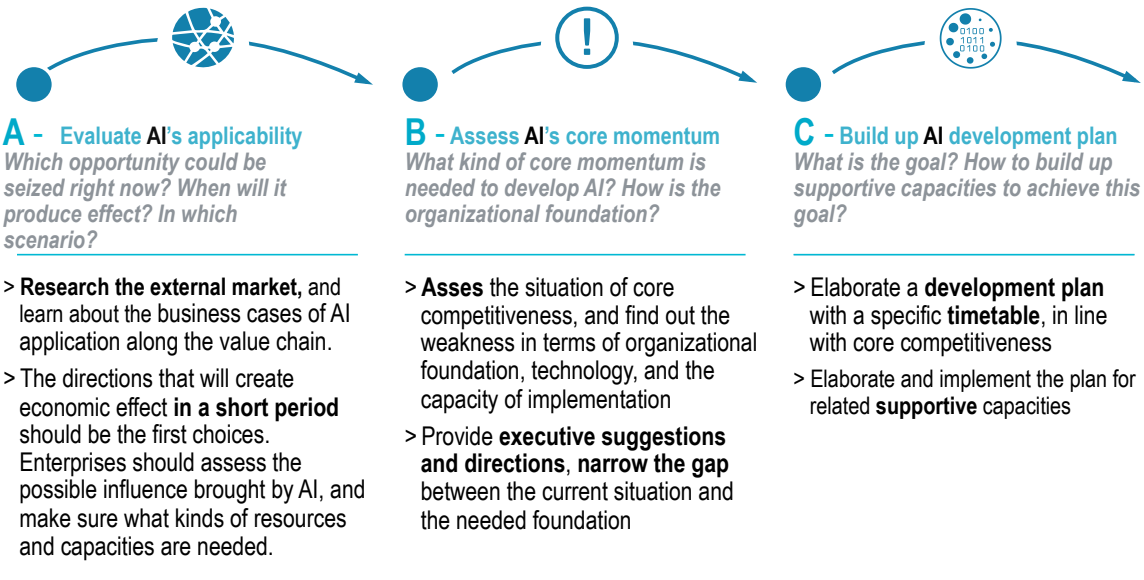
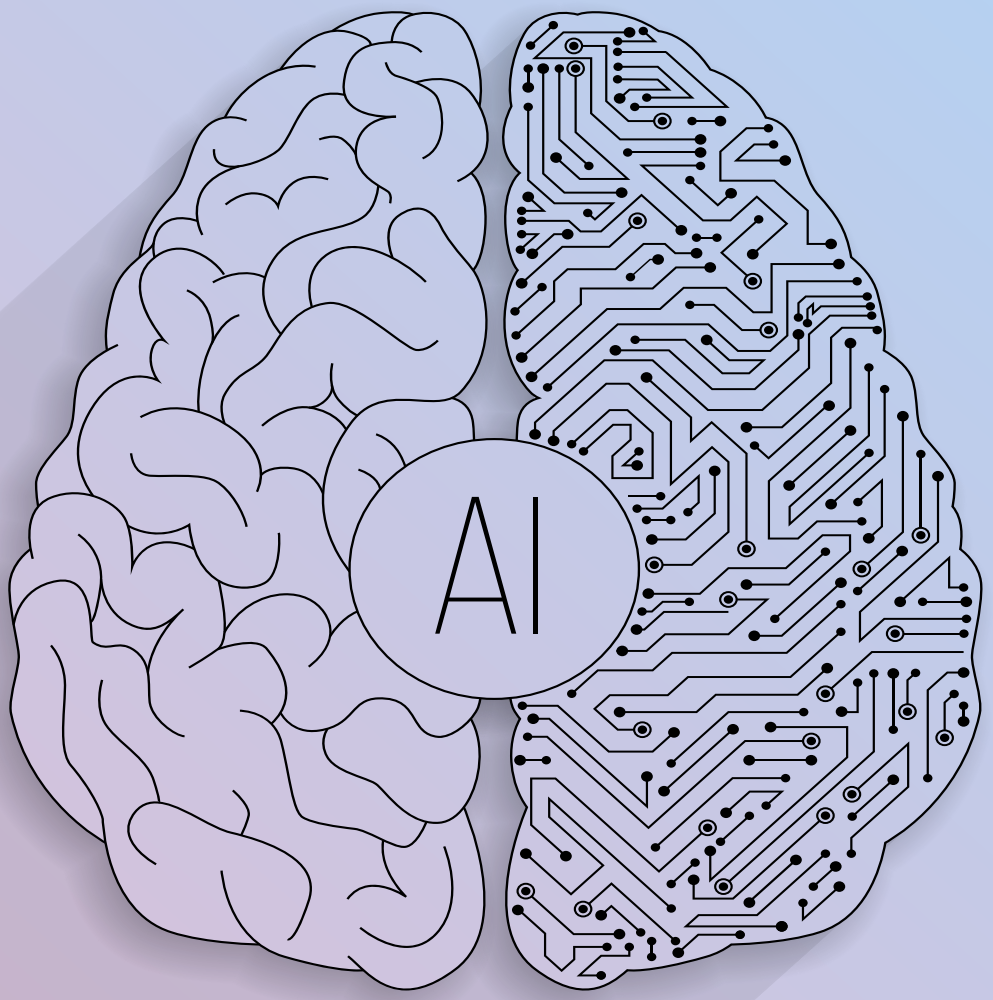




A SHARED APPROACH TO TECHNOLOGY

The impact different legal approaches could have on AI

The artificial intelligence (AI) industry has constantly been in the news recently, showcasing its growing role in today's society. However, with great power comes great responsibility and it is up to legislators to ensure a healthy and sustainable development of the industry. In this article, **Jenny Chen** and **Shane Farrelly** from **D'Andrea & Partners**, compare the current state of AI policy in China to Europe and outline what some of these regulations might hold for this technology's future.

The AI industry's recent rise has been nothing short of outstanding. Self-driving cars, sentient androids and AI systems have repeatedly bested their human counterparts in games like Jeopardy and Go. Things once only found in the realm of science fiction have now become reality. People's daily lives require the use of internet search engines, global positioning system navigation and voice recognition software. Accusations have been levelled against AI taking low-skilled jobs, however, recent developments show white-collar professionals, such as lawyers and surgeons, being eventually supplanted as well. Despite AI permeating every level of society, there has been little added to the substantive discussion as to what policymakers should do to steer this technology in the right direction.

It has been argued by AI experts that regulation, especially in the technology's early stages of development, would be detrimental to its evolution. Despite these worries, due to the impact AI is likely to have on society, it seems wise to proactively put in place regulations that can reign in some of the more disastrous outcomes that might arise.

At the global level, policymakers have struggled with how AI should be regulated. Instead, domestic governments have been focused solely on how research and development could be increased in AI. This has necessitated the recruitment and retaining of high-level talent with particular industry expertise. In-line with this policy focus, President Xi Jinping has emphasised the importance of AI in China and has boldly proclaimed that China will become a world leader in this field by 2030.

In order to achieve these lofty goals, the Chinese Government has drafted a comprehensive national policy that that can both regulate and promote China's AI development. The *New Generation AI Development Plan* (*Plan*), announced by the State Council of the People's Republic of China in July 2017, attempted to clarify misconceptions attached to AI development by "making studies of certain legal issues on AI application".

Although the provisions set out in the *Plan* are in its early stages and are primarily geared towards implementation and policy support, there are also sections which focus on AI's legal, ethical and social impact as well. Specifically, the *Plan* examines AI's impact on China's national security and privacy protections, and recommends the construction of an AI monitoring and evaluation system to oversee its use in the employment sector. When it comes to employment, the *Plan* encourages businesses to provide extensive training in AI education. This ensures the smooth transfer of unskilled workers into another profession not directly impacted by developments in AI. The Ministry of Science and Technology of the People's Republic of China (MOST) will also create an oversight body to monitor and advance the *Plan's* implementation. Spearheading its enforcement, MOST has since assigned some of China's most famous internet giants to help coordinate this program and foster development. Baidu will lead the research into autonomous vehciles, Tencent will be in charge of medical innovations, Alibaba will work on developing smart cities and iFlyTek

will improve speech interfaces.[1]

In contrast, the policy approach in Europe has been relatively more cautious. The publication of the *European Civil Rules in Robotics* brought to the public's attention the need for a coherent European-wide approach to AI investment and legality. The European Commission recognises the need for AI investment, as demonstrated by the establishment of the Partnership for Robotics in Europe (SPARC), a public-private partnership with the objective to establish a working robotics strategy. This project has already received euros (EUR) 700 million from the European Union as well EUR 2.8 million in private investments. This cooperative project is by far the largest civilian-based research programme for AI in the world.

In Europe, AI as defined by the European Commission "endows systems with the capability to analyse its environment and make decisions with some degree of autonomy to achieve its goals". The European Commission, has been more reactive when it comes to crafting suitable legislation for AI. Some of that legislation includes the *Defective Products Liability Directive* and the *Machinery Directive*. In order to assess the safety of AI, experts must be consulted before crafting a new and comprehensive legal framework.

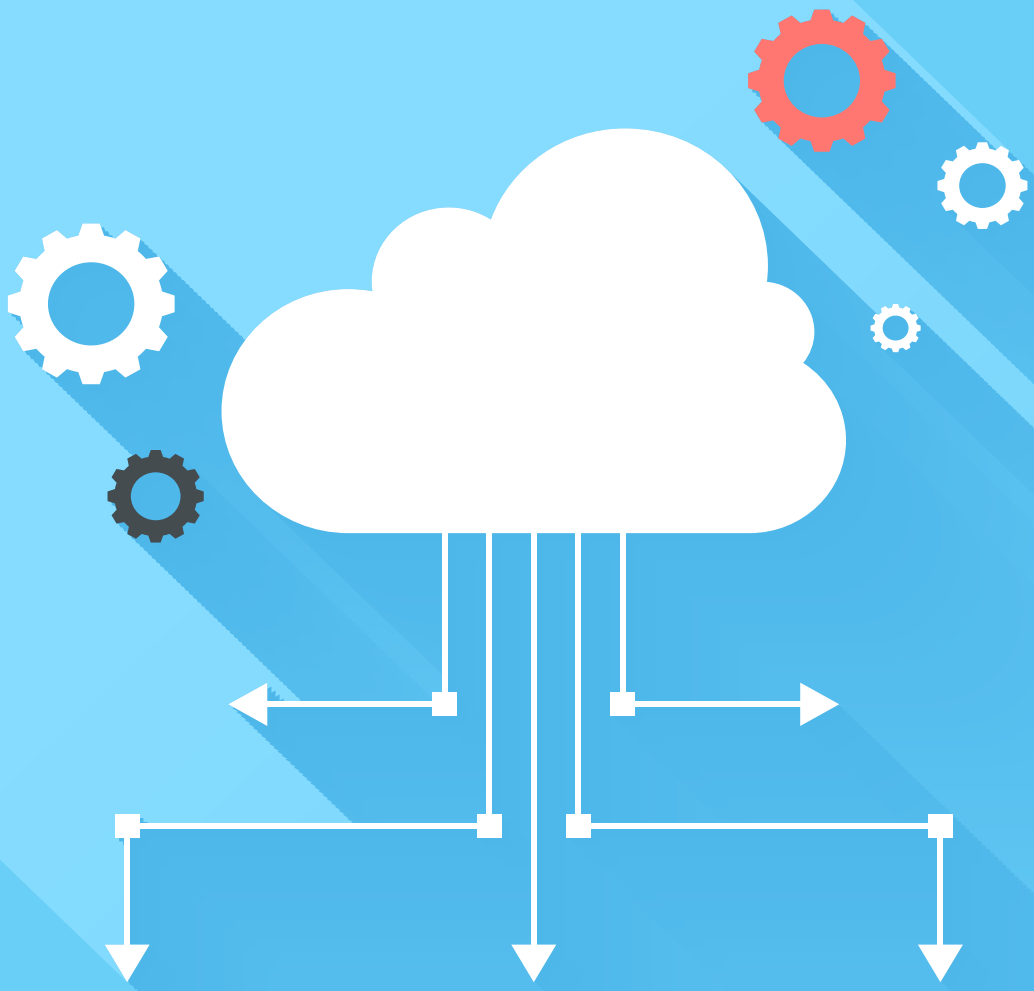
When it comes to addressing the impact AI will have on European society, the European Commission has already established the Digital Jobs and Skill Coalition, a body which aims to better equip the European workforce with the necessary skills needed to thrive in a digitised/automated workplace.

In the first quarter of 2018, the European Commission will put forward a more comprehensive approach towards strengthening the EU's AI research. This strategy will also include a way to manage the legal, ethical and socio-economic aspects of this technology.

China, finds itself closer to the 'middle income trap'. As the cost of labour continues to rise, foreign firms will be less likely to invest. In order to avoid this 'trap' the State Council has begun to improve the monitoring and evaluation of AI systems. On the European front, although there is an acknowledgment of AI's enormous potential, the EU currently finds itself in the midst of an employment issue and instead of rushing ahead, further analysis is needed before implementing a comprehensive legal framework.

D'Andrea & Partners *is an international law firm and point of reference for companies that want to enter the global market and be successful. Established by its founding partner, Carlo Diego D'Andrea, attorney at law and pioneer in Italian and European law in China, today the firm is made up of professionals coming from different countries around the world. Besides the main operational headquarters in Shanghai, D'Andrea & Partners has a number of branches in China and outside the country in Italy, India, Vietnam and Russia. The firm's clients include large industrial groups, plus medium-sized Italian, European, Chinese and global enterprises.*

1 *China Embraces AI: A Close and A Long View*, EurAsia Group, Dr. Kai Fu Lee, 2017



KEEPING YOUR HEAD IN THE CLOUDS

How foreign businesses should engage cloud computing in China

Research into and use of cloud computing is taking off around the world, and China is no exception. However, China's cloud environment has strict regulations that makes operating there a unique experience. Understanding this new and evolving landscape is extremely important and with companies currently moving their business to the cloud there has never been a better time. In this article, **Raquel de Oliveira Barra**, head of marketing at **Freudenberg IT Asia** (**FIT**), explains why China's local information technology (IT) infrastructure is so unique and outlines the benefits from upgrading a legacy computer system in order to join the world of cloud computing.

There is a consensus in most business environments about the advantages of moving certain business operations partially or even entirely into the cloud. It is the 'how to get there' that keeps most chief information officers awake at night. Despite joining this trend relatively late, China has quickly caught up. The technology and services available for cloud environments in China are state of the art and the possibilities are endless. Not only is cloud computing more in demand than ever before, but China also leads in the number of international providers seeking to grab a piece of the domestic market.

China is unique when it comes to cloud computing and perhaps one thing that distinguishes this market more from others is their strict IT regulations. Foreign companies in China are only allowed to own and operate data centres for private use and are not permitted to commercialise their internet data centres to third parties. Even the world's largest cloud providers such as Amazon AWS and Microsoft Azure, need to work with a local partner to provide their services in China. Foreign companies not only are unable to directly apply for an internet data centre licence, but face business structure limitations as well, since foreign shares in a corporation cannot exceed 49 per cent. Commenting on the issue, Xu Jiadong, manager of networking services at Freudenberg IT Asia said,

It is a complex problem, with much more to it than what most companies and users are aware of. For example, imagine a company that has its entire cloud system already set up in the United States and Europe with Amazon's AWS. This company now decides to come to China and set up a cloud environment there as well. They will need to choose their local provider very carefully to avoid interface incompatibilities. The problem would be even more complex if the company uses native cloud applications. Cloud providers all over the world are getting increasingly protective of their systems, interfaces and applications in order to avoid competition and prevent clients from switching to other providers. Therefore, we can expect this issue to get increasingly complex.

It is not only international companies who face problems when trying to move their businesses to the cloud. Local Chinese companies also face particular challenges, especially those who still run on legacy systems. This has become a chronic issue in China with Reto Bless, regional chief executive officer of Freudenberg IT Asia noting that,

In China, companies tend not to prioritise keeping their IT systems up to date. It is very common to see companies who ran an IT implementation once in the past and simply kept using that system for as long as it worked, without paying any attention to updates and new launches. On top of that, in many cases local Chinese companies have infrastructure deficiencies. We often see cases where companies invest heavily in state-of-the-art equipment, with the best servers that have lots of bandwidth, in order to set up a private cloud. Only after the company starts using it do they realise that the performance they are experiencing is not as expected because infrastructure, such as wall cabling, was obsolete and could not support this technology.

How can companies who want to move their business to the cloud overcome these difficulties? It is not too difficult, as Mr Xu explains, "Not all are challenges for those who suit the cloud. With preparation and the right information, companies can successfully transition into the world of the cloud." The first step a company should take is to organise its internal data before jumping into the cloud. The cloud's design should revolve around what the organisation's data needs are and not the other way around. Once this is clear, the company can decide on the level of safety their data requires and which cloud environment best suits its needs. This could either be the private cloud, the public cloud or a hybrid solution. The next step is to choose a cloud provider. It is essential to take into account interface compatibility or the specific regulations of each industry. After that, companies should make sure that their infrastructure is ready to support the chosen solution. Each case is unique, but following these steps will help ensure that a company follows best practices and can transition into the cloud in China successfully. Eb

Raquel de Oliveira Barra *is the head of marketing at* ***Freudenberg IT Asia*** *(**FIT**), the Freudenberg Group's global IT solutions provider. FIT has been a specialist in the needs of small and medium-sized enterprises for over 20 years. Its portfolio covers all facets of the IT industrial solutions landscape, from managed services through industrial processes to system integration. FIT Asia operates some of the safest Tier IV data centres in the world and brings companies peace of mind, so they can focus on their business without worrying about IT complexity.*

THE IMPACT OF CHEERS

A Chinese-European flagship program focused on creating climate solutions.

Global warming has become one of the most pressing issues for countries around the world. Developing methods to mitigate humanities' carbon footprint is of paramount importance and countries are tirelessly trying to craft solutions to do so. A new project called the Chinese-European Emission-Reducing Solutions Project (CHEERS), hopes to develop the crucial technology necessary to help mitigate global CO_2 emissions and hopefully prevent Earth's temperature from rising any higher. In this article, **Mahdi Yazdanpanah** and **Zhonghua Xu**, **TOTAL**, **Nils Erland L. Haugen**, **SINTEF Energy AS**, **Stephane Bertholin**, **IFP Energies nouvelles (IFPEN)**, **Zhenshan Li**, **Tsinghua University**, and **Suoshan Huo**, **Dongfang Boiler Group Co, Ltd** (**DBC**), will explain why carbon capturing could be the solution to averting global warming disaster.

Carbon capture utilisation and storage (CCUS) is widely recognised as one of the best solutions to reduce the carbon footprint of industrial activities and mitigate global warming. This new technology can help the world meet the target of keeping global temperatures from rising above 2 °C by reducing the amount of CO_2 emissions related to fossil fuel usage. The principle of this technology is relatively simple. Fossil fuels are normally exploited from underground reservoirs and then burned to produce energy, either to operate industries such as refining or to produce electricity. This combustion results in the production of CO_2 which is then emitted into the atmosphere. This innovative technology proposes an alternative way to capture the produced CO_2 and return it back to its original place in an underground reservoir. Another possibility is to use the captured CO_2 for production of other things, such as industrial chemicals.

The foundation of CCUS is capturing the produced CO_2 during combustion. This is the most expensive and complicated part of the CCUS chain. Today, there exists different technologies to capture CO_2 like chemical looping combustion (CLC). This is an innovative technology that has high energy efficiency and exerts a low cost for capturing carbon. As illustrated in the figure below, a metal oxide is used to transfer oxygen from the air reactor to the fuel reactor, where fuel is burned without coming into contact with the air. The resulting CO_2 from the combustion part of the process is not diluted with nitrogen from the air, hence, no additional CO_2 separation step is required. This is the main feature of the CLC process, which permits inherent CO_2 separation with a high degree of energy efficiency.

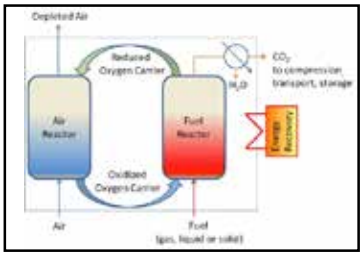


Figure 1: Principle of CLC process.

Furthering this goal, CHEERS aims to demonstrate CLC technology on a semi-industrial scale for application in the petroleum refining industry. In addition to its primary scope, the applicability of CLC technology to the power industry will also be given funding from the Ministry of Science and Technology of the People's Republic of China (MOST).

Both the refinery and power industries are key to reducing CO_2 emissions. Utilising CLC technology can reduce the amount of CO_2 emissions from a solid fuel combustion unit by achieving a carbon capture rate of up to 96 per cent. Additionally, the inherent CO_2 separation in the CLC system permits high electrical efficiencies above 38 per cent (conventional steam cycle), which means that the CO_2 energy penalty could be as low as four per cent. Comparing the performance of CLC with other available carbon capture technologies, CLC technology exhibits one of the most energy efficient methods at capturing carbon. This is a promising technology that can provide clean energy from solid fuels such as biomass, petroleum coke (petcoke) or coal. For example, a CLC unit with a 250 MWth feed using petcoke for refining applications will capture about 2000 ton/day of CO_2. The avoided amount of CO_2 emissions is equivalent to more than 700,000 cars.

The CHEERS project consists of nine partners, coordinated by SINTEF Energy Research. The consortium includes Tsinghua University (coordinator on the Chinese side of the project), Bellona, DBC, IFPEN, SINTEF Industry, TOTAL, Zhejiang University and Silesian University. This five-year project, funded primarily by EU Horizon 2020 and MOST, was started in October 2017 and a CLC plant will be installed on a DBC site in Deyang, China. This pilot plant should successfully achieve its operational goals and validate the developed CLC concept. It will also permit the evaluation of different technological and engineering challenges specific to CLC. Successful demonstration of CLC on this scale is a critical step towards implementing this as an industrial process.

The CHEERS project is comprised of several different work packages (WP), each with identified tasks. To oversee the coordination of this project, SINTEF Energy Research is responsible for overseeing logistics along with conducting lab testing and the large-scale production of oxygen carrier particles. With support from Tsinghua University, IFPEN is responsible for the work package in which the preliminary engineering design of the pilot plant will be carried out based on the concepts developed by IFPEN, TOTAL, Tsinghua University and DBC. The outcome of this will be a process design package that will form the basis for the pilot plant's engineering study. This will be coordinated by TOTAL, with support from DBC, Tsinghua University, and IFPEN. In addition to the pilot plant's design, a work package will be dedicated to the design and techno-economical evaluation of a full scale CLC plant for refining and electricity power generation. This work is coordinated by IFPEN. Tsinghua University is the coordinator of the work package that handles the construction, commissioning and start-up activities, including pilot operation. The Bellona Foundation, an international environmental non-governmental organisation, is coordinating the communication-related activities of the CHEERS project.

In addition to the main CLC reactor system, related utilities and auxiliary systems will be demonstrated in the CHEERS project framework in order to ensure the readiness of CLC technology for industrial application. The final purpose of this project is to provide a high-quality captured CO_2 stream for use in improving the production of petroleum in enhanced oil recovery (EOR) applications.

The next step after the CHEERS project will be the industrial demonstration of CLC. This requires a: fully integrated CCUS chain, including CO_2 capture by a CLC plant; treatment and compression of captured CO2; transportation of the captured CO2 at high pressure; and the injection of CO2 for EOR along with other applications. Eb

For further detail about the CHEERS project and the role of different groups, the project can be found at http://cheers-clc.eu/.

A NEW INTERSECTION IN R&D

The integration of bioscience and biotechnology

Biotechnology is advancing at a rapid pace and China, with international cooperation, has started to move to the front of the pack. Various projects have already been underway to try and improve the research and development (R&D) of sustainable systems. Whether it is microalgae, or new uses for waste straws, these recent acts of innovation are extremely important to developing a greener ecosystem. In this article, the **Qingdao Institute of Bioenergy and Bioprocess Technology** (**QIBEBT**), outlines the recent strides China has made in researching how to establish new, green sustainable systems.

Countries around the world are prioritising R&D in sustainable supply systems. Improving the R&D of conversion technologies, which includes bioproducts, bio-catalytic conversion, and thermal-chemical and chemical transformation is essential. The aim is to establish a sustainable system of bioproducts with high efficiency and low cost. This type of research is starting to take off in China and is important to establishing new, green sustainable systems.

Various species of microalgae

Using microalgae to convert CO_2, light and H_2O into oil through photosynthesis has attracted a lot of attention and is seen as a potential solution for clean energy production, high-value added bioproducts and as a high-value use of CO_2.

Theoretically speaking, microalgae will produce 20-28 tons of biomass per acre each year and each ton of microalgae could sequester 1.83 tons of CO_2. Moreover, microalgae oil could be an ideal feedstock for liquid biofuels (bio-diesel or jet fuel) and value-added bioproducts for health, pharmaceutical and cosmetic industries.

In 2013, engineered microalgae was created by Chinese R&D that mirrored a particular strain of microalgae called tribonema that are protozoa/pollution resistant and easy to harvest. This particular strain of algae also contains a high yield of oil and proved that large scale filamentary produces these special properties. If used, this particular strain of algae could also avoid many of the diseases that tend to crop up in large-scale batches of cultivated microalgae.

Utilising this new knowledge on microalgae, researchers developed a series of genetically engineered cyanobacteria to further integrate microalgae's use into existing biofuels and biochemicals. This cutting-edge research in China has led to a number of collaborations. An example of this is the recently established R&D system for microalgae biofuels and bioproducts by Boeing and QIBEBT for the development of sustainable aviation biofuels. A pilot project was also launched by Solix Biosystems and Xinjiang Qinghua to further develop uses for microalgae energy.

Comprehensive use of the waste straw

At the 14th Meeting of the Central Financial Leading Group, President Xi Jinping proposed that "as we dispose of agricultural biomass waste we should use it to make methane and biogas in order to provide energy and agro-organic fertiliser".

In 2016, the Ministry of Agriculture of the People's Republic of China published the *Programme on Promoting Pilot Projects for Making Comprehensive Use of Agricultural Waste* and estimated that annual faecal residue and waste water could reach 3.8 billion tons of crops.

The underlying problem with how to treat agricultural waste is how to breed excellent microbial communities that can adapt to anaerobic fermentation and convert straw biomass into gas. Currently, a technique is being researched for commercial adoption that will utilise highly-concentrated anaerobic fermentation to create the necessary biogas. However, there is still a lack of efficient technology that can carry out fermentation, and techniques have not yet been fully developed and/or tested.

Although some of these issues have been remedied, the R&D community still lacks the technology for large-scale commercialisation of repurposed methane. To try and address this problem, researchers have tried to develop different mixing strategies, stirring equipment and methane pressure washing equipment with the end goal being the fixing of the methane commercialisation bottleneck.

In Pingdu, a county level city in Qingdao, a pilot trial system that used these recently developed methods of handling methane was established, with an annual output of 180 thousand cubic meters. In Baicheng, a city in Jilin Province, another pilot project was established with an annual methane output of 430 thousand cubic meters that operated efficiently in cold areas.

The high value of wood fibre

Fibre biomass is the most abundant type of biomass that can be found in nature, so it is inevitable that it will try to be used to produce various types of fuel and other miscellaneous chemicals. However, problems still remain regarding how these high-quality bio-resources can be obtained efficiently and at low cost.

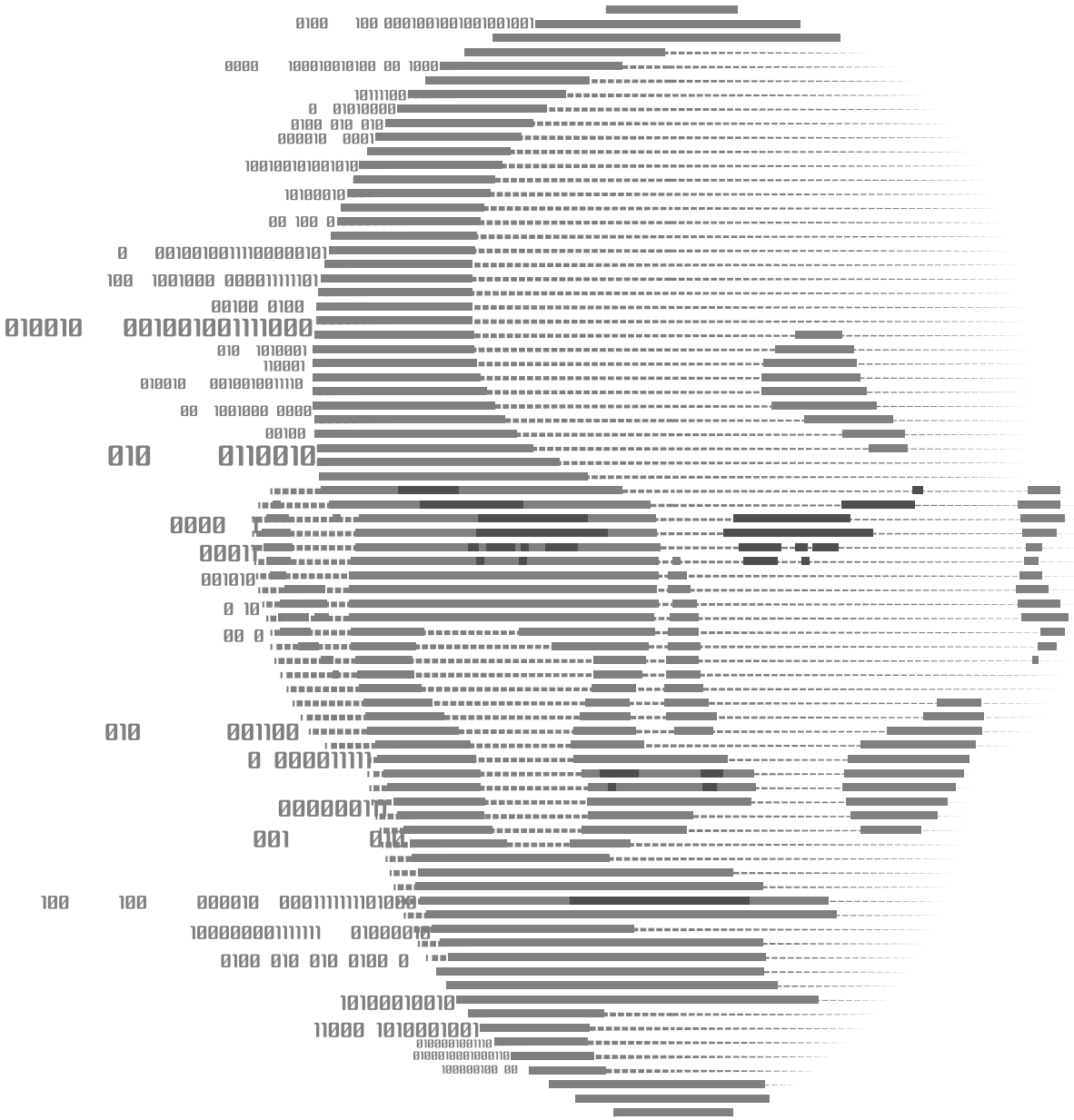
In response, scientists have tried to find a similar high-quality, non-food fibre biomass material that also has a high output, high conversion yield and can be found in sufficient supply. They also broke the barrier of natural anti-degradation and developed efficient and green fibre pre-treatment techniques. Fibre degrading molecular devices, like cellulosome, are extremely efficient. Thus, researchers have tried to develop equipment and technologies based on these devices in the hope of commercialising and improving the entire cell catalysis system. While researching the pre-treatment of wood-fibre raw materials, QIBEBT even developed a new product that could lessen the problems related to high-energy consumption and heavy pollution when using a single physical, or chemical method.

Conclusion

All of the above biotechnologies have been applied in biofuels, environmental treatments and health product development, and a total of 12 pilot projects have been established to test these revolutionary ideas that were developed in the laboratory. Researchers must uphold the idea of integrated scientific development in order to continually drive the development of these core technologies in the biosciences. Eb

The Qingdao Institute of Bioenergy and Bioprocess Technology (QIBEBT) *was co-founded by the Chinese Academy of Sciences, the provincial government of Shandong and the municipal government of Qingdao in 2006.*

To carry out this cutting-edge research achievement, the institute has attracted highly-qualified scientists from world-renowned universities, research organisations and large industries. Currently, QIBEBT has a staff of over 600 and 350 postgraduate students.



THE REALITY OF AI

A great necessity and complexity for businesses

We cannot deny that artificial intelligence (AI) is on the rise. It is seen more and more as critical to competitiveness and future economic growth, with large amounts of money being invested in AI (especially in China and the US). However, due to the complexity of AI, its associated risks and the questions it raises, this makes it tricky to adopt. In this article, **Isabelle Hajjar**, vice chair of the European Chamber's ICT Working Group for Shanghai and head of compliance at **Tek-ID**, and **Marc Pedri**, AI expert at **Tek-ID**, give an overview of these different facets of AI.

Let's AI

Technology has transformed the way people live their lives and do business. This transformation has had a sizeable contribution from artificial intelligence, with its contribution, according to McKinsey, being "10 times faster and at 300 times the scale, or roughly 3,000 times the impact" of the industrial revolution.[1] Profit margins have grown substantially (3 to 15 per cent higher than the industry average) by those businesses that have seriously adopted AI.[2] Investment in AI is growing fast and is dominated by digital giants like Google, Baidu, Alibaba and Tencent. These investments are expected to be worth more than United States dollar (USD) USD 46 billion by 2020, and global gross domestic product (GDP) is expected to be up to 14 per cent higher as a result of AI by 2030, corresponding to an additional USD 15.7 trillion. China and the United States (US) are expected to benefit the most, with a potential boost of 26 per cent to China's GDP.[3]

China looks to become dominant in AI due to its massive resources, data sets, ambitious plans and high-level government support.[4] China has deployed a host of strategic initiatives, including: the 13th Five Year Plan, the China Manufacturing 2025 initiative, the *Robotics Industry Development Plan and the Three-year Guidance for the Internet+ Artificial Intelligence Plan*. These all help to guide the growth of AI research and development (R&D). Additionally, the recent *Next Generation Artificial Intelligence Development Plan* makes AI a key strategy and includes a plan on growing a competitive AI industry that would be "worth renminbi-yuan (CNY) 1 trillion (USD 150.7 billion) by 2030".

That being said, China will still have to get to grips not only with the already wide information technology (IT) talent gap, which will only worsen with AI, but the potential for massive unemployment due to AI. The Chinese Government already estimated in 2016 that the Chinese AI sector would require an additional 5 million high-skilled workers. While some studies[5] project that 47 per cent of jobs in the US will go to automation in the next 15 to 20 years.

What is AI, and what are its perks?

With more than 60 years of development behind it, AI is an umbrella term that covers several areas of technology that simulate human intelligence processes. With the ability to self-correct and innovate, AI can include machine learning, deep learning, cognitive computing and language processing.

One of the advantages of AI is the ability to automate and expedite mundane, time-consuming tasks and to turn unstructured data into analysed and structured data in a fraction of the time that a human being would need to carry out a similar task, thus freeing up humans for higher-level tasks. Analytical tasks are the core strength of AI. Decision-making, if mostly an emotional act, remains based on facts. Getting real-time analysed and structured data, and taking emotions out of the equation thanks to AI can help improve decision-making.

By utilising AI, one can dramatically benefit from greater accuracy, efficiency, cost savings and speed. It can also provide new market and customer behaviour insights, and help transform a business's operations, products and services.

The goal for AI systems should not be to replace humans, but to provide support. Ultimately, humanity will evolve with AI. This technology is just one piece of the puzzle and the future should be figuring out how everything should fit together.

Our everyday interactions will soon be intertwined with AI, from Google search results and Amazon's product recommendations to the integration of generalised voice-controlled systems. Financial competition is taking place on the stock market due to AI, and Legal AI simulates and predicts the potential outcomes of cases based on interpretations of the law.

Businesses who disregard AI will soon suffer as it becomes a major differentiator on the market and humans will need AI to perform analytical tasks that are becoming too complex.

A mind-blowing can of legal, ethical and security worms

Adopting AI raises fundamental and complex legal, societal and ethical questions that have already provoked debate. Adapting all aspects of our life to AI will be necessary in the near future. Unlike classic-software programs, as AI evolves on its own, regulatory difficulties have started to arise and it will be more important than ever to fully understand and strike a balance with the potential threats and advantages that can arise from this technology. Although there are no concrete regulatory plans, several initiatives have been launched by the authorities and private

1 *"No Ordinary Disruption: The Four Global Forces Breaking All the Trends"* – McKinsey

2 McKinsey - Artificial Intelligence the next digital frontier? Discussion Paper - June 2017

3 PWC, Sizing the Prize: PWC's Global Artificial Intelligence Study - Exploiting the AI Revolution, 2017

4 Goldman Sachs – *"China's Rise in Artificial Intelligence"* - 2017

5 Oxford Martin, and the Bank of America (Merrill Lynch)

6 Next Generation Artificial Intelligence Development Plan – 20th of July 2017

industry. The Chinese Government has announced AI standards, and Microsoft intends to codify its ethics and design rules for this technology.

Here are some of the main questions that pertain to AI:

- Will AI have an 'artificial' personality and free will? If AI allows programs and robots to learn, grow and alter decision-making criteria, at what point does one consider AI programs and robots to have free will, a personality, rights and obligations? The European Parliament is already considering an "e-personality", and the establishment of liability for the actions of robots. From a more humorous perspective, last year Saudi Arabia granted citizenship to a humanoid robot called Sophia, becoming the first country in the world to do so.

- Currently, AI may fall under product liability (defective products), a fault-based regime, or tort law (responsibility for negligence). However, can an AI program or AI-enabled equipment be considered 'defective' or 'negligent' because it erred? One of the main difficulties is going to be determining responsibility when AIs are in cooperation with humans, in the design of the decision-making process and decision-making itself. This will make it difficult to determine responsibility among the users, distributors, manufacturers, or developers. Most likely, the question of liability will be regulated with new compensation and insurance models.

- These AI models require massive amounts of data to be trained and become effective. Data and AI algorithms must be sufficiently regulated and overseen to ensure they are not abusive or abused. Existing data privacy rules will have to be adapted to tackle the added threat posed by AI.

- Cyber-industry problems, such as a lack of security awareness and the fact that hackers are always one step ahead, will be remedied by developments in AI-enabled security. The large amount of investments, skill and IT resources put into AI-enabled security will, for the first time, allow those adopting AI to stay ahead of the hacking community. However, two major issues need to be addressed. First, government-backed hackers will become incredibly powerful and second, a self-aware AI could potentially identify humans as a security threat and take preventive measures such as blocking access to IT, reshaping internet governance or establishing self-made security protocols.

- Can AI-generated music, paintings, or models be considered original, new or inventive if their work stems from processing data? If so, who owns the potential corresponding intellectual property rights?

- The design of AI comes with ethical strings attached, as pre-set decision rules will have to be chosen. As an example, for autonomous cars do humans decide to protect the passengers at all costs, or to cause minimal loss of life or damage even if it means killing the passengers? The potential malicious uses of AI include fake-news, opinion manipulation and spreading hate speech. Having, AI-induced discrimination is also a serious issue, as real-world biases such as racism or sexism can be embedded into training data or algorithms (such as image recognition categorising Asians as blinking, black people being labelled as more likely to be recidivists, or women getting different results in a search for open-job positions).

In conclusion, AI is important and far more complex than other digitalised products and services. Both AI R&D agencies and companies that are developing, buying or subscribing to an AI product or service will face numerous AI-related risks. Some of these risks could be property loss, security issues, ethical underpinnings and scandal. If AI is indeed a game changer, businesses will have to proceed with great caution, and ask themselves the right questions.

Isabelle Hajjar *is vice chair of the European Chamber's ICT Working Group in Shanghai and head of compliance at Tek-ID, specialised in digital risk intelligence. She leads regulatory and operational compliance support, consulting, strategy and program design, implementation and roll-out services, both locally in China and on a global level, particularly focusing on cybersecurity and data privacy compliance.*

TekID's *purpose is to help organisations mitigate cyber threats and digitalisation risks by providing business intelligence beyond technical issues. It can be to overcome a compliance program (CSL, ISO, SOC, SOX, PCI, ...), evaluate technology solutions, audit your company (Security Audit, Penetration test, SAP-IN2, FCPA, ...), perform a Computer Forensic Investigation and Cyber Threats Intelligence (CFI, CTI) or to have technology experts working side by side with you.*

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European Chamber Advocacy Highlights

Chamber Discusses Financial Sector Opening with CBRC

On 30th January, Mats Harborn, president of the European Union Chamber of Commerce in China (European Chamber), led a delegation to meet with Wang Zhaoxing, vice chairman of the China Banking Regulatory Commission (CBRC) to discuss market opening in the financial sector. President Harborn and Vice Chairman Wang exchanged views on the latest economic developments in the European Union (EU) and went on to discuss the importance of fair competition in the marketplace and global economic cooperation. Representatives from the European Chamber's Banking and Securities Working Group, Consumer Finance and Non-Banking Financial Institutions Working Group, and several Advisory Council members in the banking sector

voiced their concerns. At the end of the meeting, President Harborn took the opportunity to present Vice Chairman Wang with a copy of the *European Business in China Position Paper 2017/2018* (*Position Paper*).

State Council Documents No. 5 and 39 Remain a Chamber Priority

On 18th January, Adam Dunnett, secretary general of the European Chamber, led a delegation from the European Chamber to meet with Ye Wei, deputy director general of the Foreign Investment Administration of the Ministry of Commerce of the People's Republic of China. *State Council Document No. 5* and *State Council Document No. 39* were discussed at length by both parties with Deputy Director General Ye briefing the European Chamber on their importance. Several questions were raised by the European Chamber on whether a public timetable for the opening up of various industries will be provided, along with issues pertaining to the documents' coordination and implementation. Deputy Director General Ye assured the delegation that the relevant ministries are implementing the documents and each sector will open up slowly over time. At the end of the meeting, Secretary General Dunnett presented the deputy director general with a copy of the European *Chamber's Shenyang Position Paper 2017/2018*.

Local Official Engagement in the Beijing Construction Industry

On 29th January, Javier Lopez, chair of the European Chamber's Construction Working Group, met with Zhao Yang, director of the Department of Supervision on the Construction Market of the Beijing Municipal Commission of Housing and Urban-rural Development, to discuss the industry outlook for Beijing's construction industry. Director Zhao outlined developments in Beijing's

construction industry and provided an analysis on the qualification and registration of industry practitioners. Some other issues were discussed, including green development, energy-saving construction and the work plans of the Beijing Municipal Commission of Housing and Urban-Rural Development. The meeting concluded with Mr Lopez presenting a copy of the *Position Paper* to Director Zhao

Environmental Tax Law at the Centre of SAT Meeting

On 8th February, the European Chamber hosted a delegation from the State Administration of Taxation (SAT) who were there to discuss the implementation of the environmental protection tax. Gianluca Ghiara, vice chair of the European Chamber's Environment Working Group, welcomed Sun Qun, deputy director general of SAT, and Zhang Yanchao, chief officer of the Department of Property and Behaviour Tax of the SAT, and discussed the impact the *Implementing Regulations of the Law on Environmental Protection Tax Law* has had on member companies. The members of the Environment Working Group then proceeded to raise their concerns on the new

environmental tax with Deputy Director General Sun and Mr Zhang. The meeting concluded with Mr Ghiara presenting the European Chamber's *Position Paper* to Deputy Director General Sun.

Chamber Participates in Shanghai Symposium on the Business Environment

On 26th January, the Shanghai Municipal People's Government Foreign Affairs Office invited a delegation from the European Chamber to participate in a symposium on Shanghai's business environment. Dr Ioana Kraft, general manager of the European Chamber's Shanghai Chapter, joined representatives from European consulates, other foreign chambers and industry associations. At the symposium, Dr Kraft shared some key findings and recommendations from the *European Business in China Business Confidence Survey 2017/2018* and the European Chamber's *Position Paper*. These included further improvements to Shanghai's quality of life, the simplification of the work and business visa process, the removal of market access barriers

and the easing of investment restrictions in certain industries. At the end of the meeting, Dr Kraft presented the aforementioned two publications to Zhou Yanjun, deputy director general of the Shanghai Municipal People's Government Foreign Affairs Office.

CHINA IPR SME HELPDESK

A host of foreign enterprises have seen the opportunity for conducting research and development (R&D) in China. However, business have repeatedly run into problems when it comes to ensuring they are guaranteed the credit for their hard work. Navigating the ins and outs of ownership in intellectual property (IP) can be complicated, which is why the **China IPR SME Helpdesk** clarifies what businesses should do when faced with IP problems that stem from conducting cutting-edge research in China.

UNDERSTANDING CHINESE R&D OWNERSHIP

Understanding Chinese R&D ownership in China.

Many European small and medium-sized enterprises (SMEs) may not consider their conduct in China R&D, since they do not have a laboratory or research facility located in the country, but in reality, a high proportion of these companies engage in activities which do fall under this category. For instance, an SME might engage in R&D by entering into a contract with a local company to use their engineers for the purpose of developing a commercial prototype.

The impact of IP is a critical consideration for European SMEs wishing to do business in China. When undertaking R&D in China, new IP is being created so a company's intellectual property rights (IPR) need to be clearly defined.

IP ownership

If the primary inventors are non-Chinese citizens, European SMEs will have much more leverage in deciding how to control their IPR. However, if members of their team are Chinese, and they are expected to make key contributions, IPR ownership will become more sensitive when negotiating the terms of an agreement. To retain their rights to a product, SMEs will need to sufficiently reward individuals for their contributions if ownership is not granted. Additionally, SMEs will need to consider the legal status of individual Chinese inventors. For example, if the inventor is an employee of another organisation or a researcher at a local university, the inventor may be under a contractual duty to assign his/her IPR to that employer. Ignoring the inventor's existing legal duties can cause serious problems, as an SME might actually lose ownership of a prototype due to pre-existing obligations.

Ownership of IP is less of an issue if European SMEs set up their own entity in China to conduct all R&D activities. These SMEs can instead choose to file patent applications under a Chinese entity, or its affiliates outside China. Placing IPR under an overseas entity can allow for greater flexibility which can suit the future needs of a business's operations. Furthermore, companies have also increasingly applied for IPR under Chinese entities in order to qualify for the incentive plans offered by the Chinese Government.

If European SMEs go in this direction and rely on their local business partner, IPR ownership may become more complicated. Some common choices in IPR can be seen below:

- sole ownership of all IPR by European SMEs
- sole ownership of all IPR by Chinese business partners
- co-ownership between European SMEs and their Chinese business partners

The terms of co-ownership is largely defined by contracts and can be a sensitive issue between foreign SMEs and Chinese business partners. Excessive fighting over

ownership will increase the amount of risk associated with future business co-operation, so it is therefore advisable to revisit the business models one has in place, and make sure that contracts on ownership are signed and mutually agreed upon. That way, licensing and other legal tools that could be used if a dispute arises could be clearly defined from the start. For instance, if an SME realises that the software it has developed can be used for another business model that their Chinese business partner is not directly involved with, that SME may need to craft an agreement that will allow it to use that software in China. Failure to do this will likely lead to future disputes.

IP licensing

An IP licence is a contract to permit where, when and how IP can be used by another party. This can be done for free, for royalties, or in exchange for other services. In most R&D contracts, licensing is key. The greater the leverage a Chinese business partner has in marketing and executing a product, the more consideration is given when considering licensing options.

In practice, licensing is one of the most important legal tools that SMEs overlook. Part of the reason is that SMEs are not always confident about the effectiveness and enforceability of contracts they entered into with Chinese partners. People may be afraid of unfair court rulings and difficulties with enforcing judgements and while such considerations may be justified, SMEs should not overlook the importance of using contracts. Despite these fears, IP licensing options should be well-thought-out prior to engaging in negotiations.

In China, common types of licences, including exclusive and non-exclusive, are permitted. Existing laws and regulations are designed to give a large amount of autonomy to groups that are deciding what to do with their IP licences. Parties can negotiate and reach a mutual agreement on the following key terms:

- Territory of the licence: Does the licence cover China or is it applicable worldwide? Is it better to have a licence that covers a certain specified geographical area in China?
- Duration of the licence: When does the licence expire? How should it be renewed? Can the licence be terminated under certain clearly-defined circumstances?
- Licensed IP: Are you only going to license your patents? What about copyrights and trademarks? How about less familiar types of IP that deal with graphical user interfaces, sensitive client information or special skills? Some innovations may not be fully protected by the patent, trademark or copyright laws.
- Royalties: You can choose a lump-sum payment, running royalties, or even operate royalty-free for a limited period of time and then proceed to charge. Issues like taxation and auditing should be addressed as well.
- Limitations of the licence: Do you have to give a warranty or indemnify everything asked for by your Chinese partner? Think of ways to limit your exposure to liabilities.

European SMEs should be aware that some licensing contracts need to be reg-

istered with the appropriate Chinese authorities in order to be fully enforceable in China. For example, a trademark license agreement needs to be registered with the China Trade Mark Office and the patent licence agreement must be registered with the State Intellectual Property Office. Extra costs will be incurred when registering licence agreements with different Chinese IP authorities.

In the context of joint-IP development, European SMEs should keep in mind that Chinese laws do not allow foreign companies to retain ownership of improvements made by Chinese parties, unless the Chinese parties are remunerated in some way for these inventions. This remuneration could be in the form of cash, shared profits, equity interest, or some other form of IPR. Chinese law also requires that the foreign company provide the technologies to the proper authorities in order to authorise its quality and usefulness, as well ensuring that the foreign enterprise is liable if the technology turns out to have infringed another's legal rights. Therefore, European SMEs and their Chinese business partners should decide on a fair and workable solution for remuneration before proceeding with a deal.

China IPR SME Helpdesk

*The **China IPR SME Helpdesk** supports small and medium-sized enterprises (SMEs) from European Union (EU) member states to protect and enforce their IPR in or relating to China, Hong Kong, Macao and Taiwan, through the provision of free information and services. The helpdesk provides jargon-free, first-line, confidential advice on intellectual property and related issues, along with training events, materials and online resources. Individual SMEs and SME intermediaries can submit their IPR queries via email (question@china-ip-rhelpdesk.eu) and gain access to a panel of experts, in order to receive **free and confidential first-line advice** within **three working days**.*

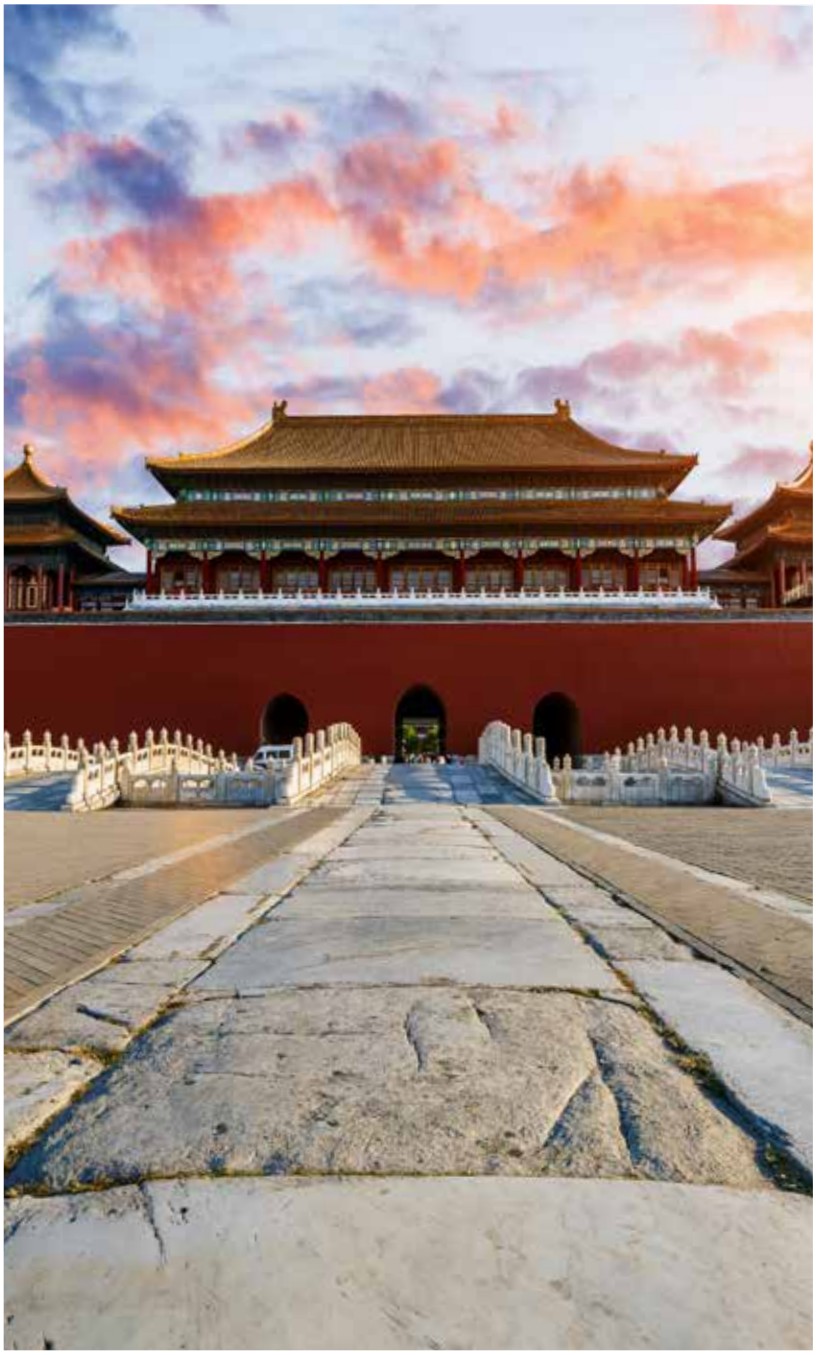
The China IPR SME Helpdesk is co-funded by the EU.

To learn more about the China IPR SME Helpdesk and any aspect of intellectual property rights in China, please visit our online portal at http://www.ipr-hub.eu/.

A RE-IMAGINING OF CHINA'S IP LANDSCAPE

What the BRI means for China's IP strategy…Part II

The One Belt, One Road initiative, now called the Belt and Road initiative (BRI), is nothing new. For a while, China has been investing time and effort into re-imagining existing trade-routes along the silk roads of antiquity. The impact of this Chinese-led economic initiative has been widespread and along with promises for increased economic growth and trade comes the concern that new challenges will be faced in the world of intellectual property (IP). In this article, **Elliot Papageorgiou** and **Molly Zhuang**, from **Clyde & Co**, advise how European businesses can prepare for new IP challenges arising from the BRI.



In late-2013, President Xi Jinping was proposing a new 'economic belt' along ancient silk roads and a '21st century maritime silk road'. What is new, is the visibility and attention that many of China's projects have recently been accorded. Due to this visibility, now is a key time for European businesses in China to consider what these projects mean from an IP perspective.

What countries are featured in the BRI and how will it impact the IP environment?

According to official sources, China's BRI covers a total of 66 countries. From a European perspective, the BRI spans countries along almost the entire European Union (EU) eastern border, despite some of these countries having IP systems considered a 'work in progress'. From an IP perspective, one would:

1. **Expect China to generate more outbound IP, and increased IP filings especially along BRI routes and in BRI countries.**

   The Chinese Government will continue to encourage Chinese companies to proactively file abroad by providing support and added incentives. Those along the various BRI routes will benefit from this drive. Expect increased filing in countries like India, Singapore, Vietnam, Thailand, Malaysia, Philippines, Turkey, Indonesia, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Iran, and Russia since these countries are given special attention by being listed as one of China's 14 stops on the 'land-belt' portion of the BRI.

2. **Expect increased filing in China by larger BRI countries.**

   While the total amount of IP filed in China by BRI countries has remained modest (only Singapore ranked in any top 10 filing list), one can expect to see a steady increase in filings by BRI countries as they receive greater exposure to China's economy, industry and culture. Specifically, one should expect to see countries such as Russia, India, Turkey, Thailand, Malaysia and Singapore to increase their IP filings in China.

3. **Expect Chinese brands to become more prominent along BRI routes.**

   Internationalisation of Chinese brands is one of the strategic tasks set out in the government's China Manufacturing 2025 initiative. With greater Chinese investment along BRI routes countries will become more aware of Chinese brands as they accompany Chinese businesses going abroad.

1. How should European companies adapt their IP prosecution strategy in light of the BRI?

1. **File more trade marks in countries that follow the various BRI routes and in countries along Europe's eastern border that are not already covered by European Union (EU) trademark protections.** European companies should consider filing trade marks for their core brands, core products and service classes in key countries along BRI routes and countries where EU trade mark protection does not extend to.

2. **Closely monitor trade mark and patent applications in BRI countries, including China.**

As a result of BRI, more of China's IP is likely to be extended to countries along BRI routes. Therefore, to clearly understand competitors' IP position and challenge their trade mark or patents if necessary, European businesses should closely watch competitors' IP in China and key countries along BRI routes.

3. **Develop a robust system for securing and formalising prior art evidence in China.**
Building up a database of prior art/prior use/prior publication evidence will continue to grow in importance as the number of intellectual property rights (IPR) originating in China continues to increase. If prior art evidence is secured in China for later use, then fewer formalities are required (i.e. only notarisation is required) than if properly secured overseas. This saves both on time and expense.

4. **Consider invalidating rights in China, before they are extended/designated along BRI routes.**
Given that China-origin IP rights are expected to increasingly be extended to BRI countries, if European companies discover adverse IP rights in China they should attack them as quickly as possible.

5. **Evaluate the technological potential of each BRI country on what it could potentially do for businesses**.
For broadly applicable technologies, in quite a few BRI countries, they must have their patent and design rights adequately supplemented. Some of these technologies include those relevant to shipping, railways, road-transport and infrastructure/road-building industries. For other industries, supplemental filing will be more geographically limited. For example, in certain sectors of the petrochemical industry securing rights in Kazakhstan will likely be a higher priority than in Serbia.

2. How should European businesses adapt their IP enforcement strategy in light of the BRI?

1. **Adapt customs recordals and enforcement in China.**
As China expands its economic reach along BRI routes, increased trade between China and BRI countries will result. As Chinese customs is one of the few border control administrations that actively monitors exports from the country, investing in customs recordals for IPR in China, coupled with appropriate training and support for customs enforcement, will continue to be important to maintaining control over infringements in BRI countries.

2. **Focus on improving customs policing in key ports in China and BRI countries.**
Given the intended routes of the BRI, focused customs policing and enforcement will be crucial. In China, depending on the product, policing should focus on the inland port of Urumqi near China's northwestern border with Russia and hub-ports like Dalian, Tianjin, Qingdao, Shanghai, Ningbo, Xiamen, Guangzhou and Shenzhen. Furthermore, border crossings with Russia, Kazakhstan, Vietnam, Laos, Myanmar, Tajikistan, Kyrgyzstan and Mongolia will warrant greater focus as well.

3. **Increase IP enforcement in European countries that border those participating in the BRI.**
Increased trade along BRI routes has the potential to increase infringement and cause other IP issues along the eastern border of the EU. In order to counteract this, European businesses will need to invest in IP enforcement along the EU eastern border and in European BRI countries.

4. **Re-double enforcement efforts in China.**
China's IP enforcement system is gaining experience much faster than other countries' IP systems are. China's administrative enforcement authorities (this being rare or non-existent in many other jurisdictions) number well over 150,000. In the last 10 years, China's court systems have honed their IP expertise by participating in over 800,000 cases of IP-litigation (213,000 in 2017 alone). In short, China's IP enforcement system is arguably more accomplished than many other countries along BRI routes. In light of this, European businesses would be well advised to re-double their IP enforcement efforts in China and use their considerable tools to stop infringers before they strike-out along BRI routes.

The BRI has the potential for greatly impacting the economies of every country along its routes. However, one thing is for certain, it will also open up a host of new IP challenges and require new ways of thinking about IP protection and enforcement. Surprisingly for some, the best option for effectively enforcing IPR, may involve strengthening IP protection and enforcement efforts in China. Eb

*With over 2,500 staff across six continents, **Clyde & Co** is well known for its expertise in emerging markets, international trade, and high profile and/or difficult dispute resolution work. It has a well-established IP practice in the Middle-East and North Africa and launched its Greater China IP practice in 2017 centred around **Elliot Papageorgiou**. It's core industrial sectors centre on industrial manufacturing, infrastructure, insurance, international trade, transportation and natural resources, with a fast-growing reputation in other industries as well.*

APPROVING OF DIGITAL MEDICINE

The effects of digital medicine on global healthcare

Digital technology in healthcare is increasingly becoming a part of everyday life and integral to future medical advances. Recently, countries have been acknowledging these developments and approving the use of cutting-edge techniques in the medical field. Showcasing this important turn of events, **Harsha Madannavar**, **Helen Chen** and **Justin Wang**, from **L.E.K. Consulting**, explain how digital medicine can help solve three core problems bedevilling the development and delivery of healthcare not only in China, but around the world.

In November 2017, the US Food and Drug Administration (FDA) approved what is perhaps the boldest use of digital technology in healthcare: a pill that houses an ingestible sensor that captures information about whether the patient has complied with his or her medication regimen. A patient ingests the pill and sends the data to a patch worn on the torso. From there the information is wirelessly sent to a mobile phone application (app), which allows both the patient and the physician to track how the patient is using and responding to medication.

The FDA's approval of Japan-based Otsuka Pharmaceutical's Abilify MyCite for certain psychiatric conditions—a first for digital medicine—will be seen as a landmark in patient-centred care. The problem that digital medicine addresses is profound. Approximately 50 per cent of patients do not regularly take their prescribed medication and 20–30 per cent of prescribed medications are never picked up at the pharmacy. The cost of medication nonadherence runs into the billions.

Bridging the gaps in global healthcare

The benefits of digital medicine go beyond cost saving. Over time, it can help solve three core problems, also known as gaps, that are bedevilling the development and delivery of healthcare around the world.

Outcomes. For starters, digital medicine can bridge these gaps. When physicians have the ability to track their patients' compliance when it comes to taking a prescribed medication, they can manage their care better. This results in superior health outcomes. Imagine algorithms found in Amazon.com applied to health instead of shopping. When precise information about an individual's use of drugs is analysed and then aggregated, healthcare professionals can gain better insight into when to intervene and how best to allocate time and care with respect to prioritising need-based care. Health outcomes are more likely to happen when health professionals and patients work in concert.

Access. Digital medicine could also bridge the access gap. In many parts of the world, patients live far from a modern medical practice or large medical centre. Digital medicine can alert a physician to events that may require intervention, such as a skipped dose or the presenting of an alarming side effect. This improvement holds the potential for upgrading the speed and accuracy of medical decision-making.

The following factors make China ripe for digital medicine: a majority of the population uses the mobile messaging platform WeChat and healthcare services in both urban and rural areas is insufficient. The rollout of digital medicine in China will revolve around mobile-powered applications including telemedicine and remote consultations.

Innovation. Digital medicine may also play a role in ensuring healthcare sustainably innovates. It may take the healthcare world up to a decade to fully wrap its head around the extraordinary potential of digital medicine.

The data yield from digital medicine offers the potential to select the right patients for a clinical trial or better understand how patients respond to treatment during a clinical trial. It can suggest new avenues of pharmacological research and support portfolio planners in their evaluation of assets and allocation of resources. It can also significantly streamline and focus pharmaceutical research and development.

Challenges facing digital adoption

The ability of digital medicine to bridge all the above gaps and become a global standard presupposes that it has achieved a critical mass: that doctors have adopted it, regulators are comfortable with it, patients are demanding it and insurance payers are covering it.

Here are where two key challenges come in. First and foremost, there is a degree of scepticism among pharmaceutical companies and physicians. Pharmaceutical companies can be notoriously slow to integrate innovative technologies or platforms. Physicians, particularly those in large hospital systems, will take a wait-and-see attitude towards digital medicine. A few early apps like Otsuka's Abilify and MyCite will raise awareness of the technology and speed up its acceptance in the marketplace. Other parts of the world, such as China, will likely be early adopters, leading the way in healthcare innovation, on mobile phones, apps and social networking.

Another challenge is that privacy concerns may hinder adoption in some parts of the world, particular in Western societies. The experience in China suggests that volunteering personal information, is prevalent although the government has recently begun to explore privacy issues. Physicians' attitudes will evolve over time and will likely be shaped by patients' attitudes. Patients from the US and Europe quickly understand who controls their personal information and that allowing a physician to see it helps digital medicine progress. People may soon start to demand access to digital medicine-based solutions.

Global pharma's continued evolution

One thing is for sure, the world is entering a new period of patient-centred digital health. Digital medicine will play an important role in the evolution of global pharma. From today's medical industries that enables doctors to prescribe medications to tomorrow's servicing solutions, digital medicine can help consumers reach healthy outcomes. Eb

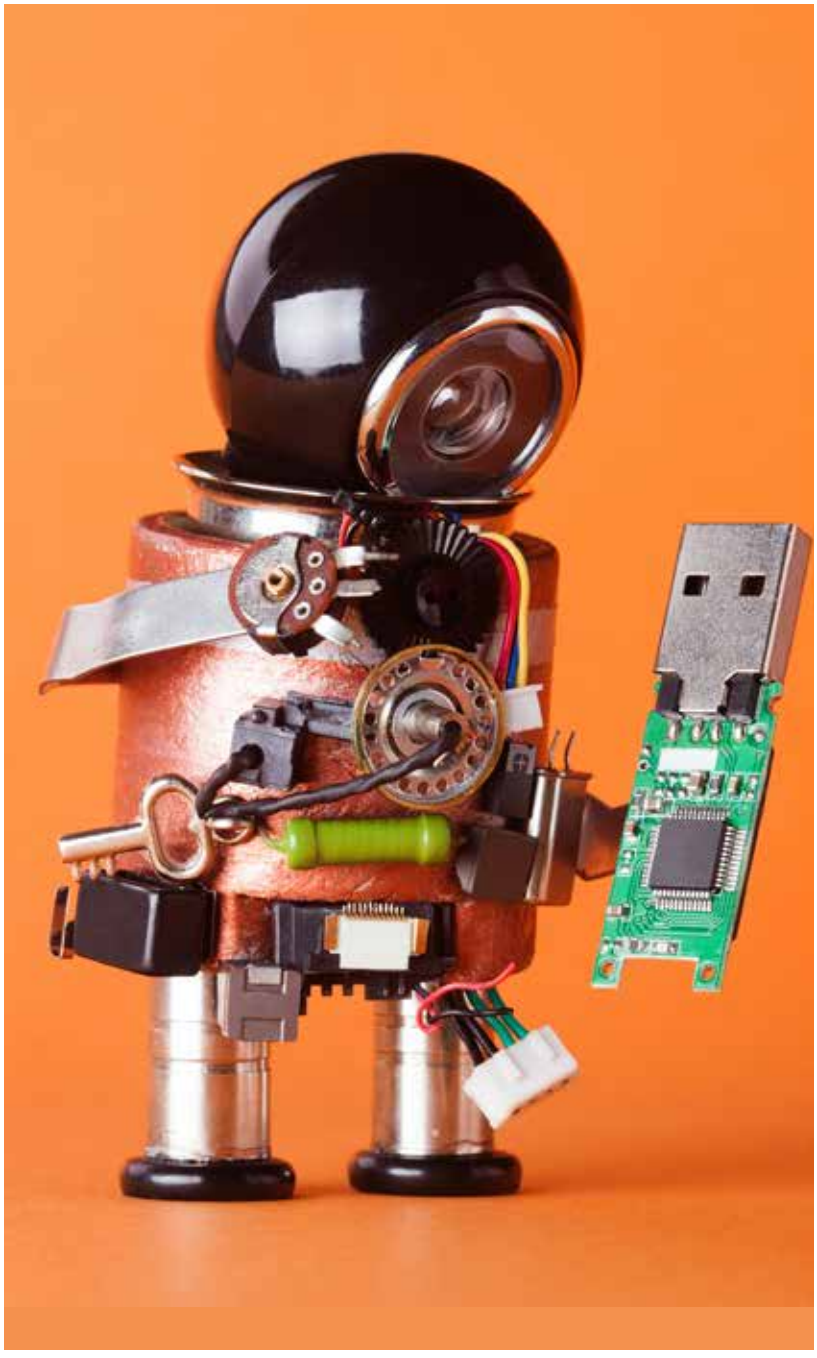
This is an excerpt from an article originally published at Pharmaceutical Online.

***L.E.K. Consulting** is a world leading management consulting firm founded in Europe in 1983 and started doing business in China in 1998. L.E.K. Consulting now has 20 offices in Europe, the United States, Asia and Australia, with over 1,200 employees and over 100 partners.*

A SPOTLIGHT ON CYBERSECURITY RISKS

EU general data protection in 2018 and its effect on smart toys

Smart, high-tech toys are popular among millennial parents as they are considered good tools to use when it comes to educating children. On the other hand, their growing popularity also raises security and privacy concerns. To protect people's personal information and ensure their privacy, the European Union (EU) has issued the *General Data Protection Regulation* (*GDPR*) which will take effect in May 2018. This regulation will have an impact on all products and services sold within the EU. In this article, **Roy Luo**, general manager of **TÜV Rheinland's Greater China** electrical, will discuss the *GDPR* and its effect on companies.



During the holidays, many parents purchased smart, high-tech toys as gifts for their children. Millennial parents are more likely to let their children spend more time staring at some sort of screen on an electronic device than previous generations would. 'Edutainment' is now the guiding principle for parents purchasing toys. Parents are willing to spend more money as they believe these toys are more educational and creative. Smart, high-tech toys include robots controlled by smart phones, dolls with corresponding applications (apps) and bespoke soft toys with interactive functions.

Most parents understand the dangers of letting children use social media and so they track their online activities. Many parents instinctively shy away from posting pictures of their children online. This may be a smart move, since their activity is probably being tracked and the collected data may be used in a harmful manner. However, few parents pay attention to the warnings listed on their recently purchased high-tech toys. Due to this, children are now being exposed to cybersecurity risks at an alarming rate.

EU GDPR is set to take effect

Privacy and data security has always been important issues for the EU. The *GDPR*, which will become mandatory on 25th May 2018, will set rigorous standards for the protection of a person's personal data. The scope of personal data protection in the EU will be increased and will also be globally applicable. All manufacturers, whether they are located within or outside the EU's borders fall under the *GDPR* if their products or services are sold within the EU and involve the storage and processing of EU citizens' personal information.

Here, personal information refers to the personal data of EU citizens during data processing that can be used to identify them in any way. The content protected by the *GDPR* is broad in scope and not only covers personal information such as address, telephone number and identification number, but biometrics and online positioning data as well.

All EU member states will enforce these strict regulatory controls once the *GDPR* takes effect. Companies who do not are subject to massive fines of up to euro (EUR) 20 million, or four per cent of the company's global yearly revenue (whichever is highest). The fear of personal information being compromised by smart devices is not new. Germany's Federal Network Agency recently banned domestic sales of children's smart watches in 2017 and parents were encouraged to discard smart watches immediately. The lack of encryption technology in these smart devices allows hackers to easily break into them and track a person's location with ease. Once the *GDPR* takes effect, not only will the products be reported, but the corresponding company will be fined as well.

How to avoid breaking the law?

First, vendors should reduce the collecting and processing of a person's personal information. Personal information unrelated to the declared function must not be used and if it is necessary to store a person's information, then its use must be detailed in the product manual and warn the consumer on how it is an essential part of the product. For example, if a smart doll only engages in simple conversation with children, such as responding when asked about today's weather, the doll should not have the ability to track a person's location or collect personal information as it would be non-essential to the toy's purpose.

The law also recommends that vendors provide default privacy settings for their products and services. This function could disable the collection of personal information by default. The user can then decide whether they want to enable the function and if they do then it must meet a certain standard of encryption.

This regulation requires product and service vendors to use a sound environment and service process controls to protect personal information from misuse, from being leaked through hackers, or being illegally shared with unauthorised third-parties. The law recommends testing by independent third-party organisations to determine whether your business complies with GPDR requirements.

Product/Service Testing and Verification

Internet of things (IoT) manufacturers that supply products or services to EU countries must abide by this new law and enforce it. Verified IoT products and services are issued certification marks by a third-party organisation, which includes the IoT product and service privacy protection mark. In accordance with GPDR rules, the product certification standard evaluates the privacy protection of an IoT product based on five levels: hardware and firmware, communications, applications, documentation, and data usage. Privacy protection certification for IoT services is evaluated in seven dimensions including the information technology (IT) environment (including applications), data protection, organisational management, service process, penetration testing, documentation and auditing of service partners.

TÜV Rheinland *is a global leader in independent inspection services, founded over 140 years ago. The group employs 19,300 people in 69 countries worldwide. Our independent experts stand for quality and safety for people, technology and the environment in nearly all aspects of life. TÜV Rheinland inspects technical equipment, products and services, and oversees projects and processes for companies. Our experts train people in a wide range of careers and industries. Our service scope includes industry and energy; transportation; machinery; electric and non-electric products; food; management systems; and training and consulting.*

MAKING THE BAY GREAT AGAIN

China's Greater Bay Area and what it means for European business

In a mere decade, the Pearl River Delta (PRD) has transformed itself from the workbench of the world to a global innovator. Like the reform and opening-up period of the 1970s, the PRD has once again appeared on the Chinese Government's radar. In this article **Marco Förster**, a consultant at **Helis & Associates**, answers some questions regarding the impact of future PRD developments on European businesses in China.

In a plan to create a megalopolis, where cities in the PRD will cooperate with both Hong Kong and Macau, a region titled the Greater Bay Area (GBA), certain questions remain: How exactly does the GBA strategy compare to China's 'go west' strategy or the Belt and Road Initiative? What does the GBA offer that the Bohai Economic Rim and Yangtze River Delta do not? Even in its early days the PRD was a trading hub. Compared to Beijing and Shanghai however, this area played a lesser role in terms of national importance in the first few decades since the founding of the People's Republic of China. Initially, this area was economically weak and dominated by agriculture. However, today China's wealthiest men and women live in Guangdong (Shenzhen and Foshan respectively).[1] The PRD is now considered a postcard-perfect region, with numerous stories detailing how poorer rural areas are becoming increasingly urban and how people living in the area are achieving billionaire status overnight.

The PRD experienced an upswing after Deng Xiaoping's decision to make Guangdong an economically stronger region. This entailed an experiment, the establishment of a market-led economic system inside the larger framework of a communist country. Hong Kong and Macao have classically acted as areas where foreign investors can invest in the PRD. Now, these areas act as stepping stones for Chinese enterprises reaching out to the rest of the world. Over the last 20 years, industrial sites, export processing zones and technology parks have multiplied, accommodating both domestic and foreign enterprises. What is unique about the PRD is that the cities inside this area are highly diverse, each one a homegrown expert in the industry they excel at. Hong Kong, Macau, Guangzhou, Shenzhen, Foshan and Dongguan are all powerhouses, whether it be in trading, production, finance or innovation. For example, more than half the world's microwaves are produced in Foshan and nearly 90 per cent of the world's drones are assembled in Shenzhen.

Whereas Shanghai has traditionally received a great deal of attention, the PRD has often been overlooked in the West, despite its astonishing rate of industrialisation, development and innovation. Showcasing its relative lack of attention, less than 10 per cent of all German businesses in China have operations in Southern China. This is in contrast to a reality where the PRD is generating nearly half the mainland's high-quality international patent filings.

Guangdong generates approximately 10 per cent of China's gross domestic product, similar to the size of Spain's entire economy. Whereas some parts of Northeastern China are dominated by state-owned enterprises, this region's economy is made up predominantly of privately-held firms. This has led the West to look to the region as an example for China to follow, with the *Economist* stating in 2017 that "China can learn from the Pearl River Delta". [2]

The PRD's excellent infrastructure is another advantage. For example, Hong Kong, Zhuhai and Macao will be linked by the world's longest sea bridge. Despite heated discussions on border controls, starting this year a new high-speed railway line will connect Guangzhou's South Railway Station to Tsim Tsa Shui in Hong Kong. These connections may ease travel across the GBA, but can they also improve cross-border harmony?

Why did the GBA only recently emerge in government reports? The idea of connecting Hong Kong, Macau and mainland China was envisaged years ago but not formally proposed until 2011. In response to this question on March 2017, Chinese Premier Li Keqiang announced a plan titled the *Development of a City Cluster in the Guangdong-Hong Kong-Macau Greater Bay Area*. Soon after that, it made its official debut in the government's work report delivered at the National People's Congress in Beijing.

How successful will cooperation be between Guangdong, Hong Kong and Macau? Will there be too much talk and too little action? Wang Rong, provincial chairman of the Chinese People's Political Consultative Conference[3] in Guangdong, says working with Hong Kong and Macau means dealing with "one country, two systems and three customs zones". One of the imminent issues that will have to be resolved is whether Hong Kong will give a portion of their revenue generated in the GBA to the central authorities. Observers have suggested that a high-level standing body be established to coordinate the development efforts of the GBA.

However, the combined GBA would then become the largest city in the world, with an even higher population than the metropolitan area of Tokyo. This project will undoubtedly become Asia's, if not the world's, largest technology region, challenging Silicon Valley as a world-class cluster of innovation and business. The Chinese Government hopes that cities in mainland China will cooperate with Hong Kong and Macau and capitalise on their competitive advantage in order to rapidly develop.

The economic potential of the GBA already equals the size of a G20 member. Would a successful global enterprise refrain from participating in an economy that has the same market capacity as Australia? While government strategies are being written and discussed, it is more important than ever for European businesses to take another good look at the GBA. Eb

***Helis & Associates** is a politico-economic communication agency, facilitating effective dialogue between Chinese & European decision makers both in politics and business. Our customers include trade associations, regional governments and corporations looking to foster business development in both China and Europe.*

1 Ma Huateng, Tencent and Yang Huiyan, Country Garden Holdings

2 The Economist Special Report: '*What the country can learn from the Pearl river delta*', 8th April 2017

3 Chinese People's Political Consultative Conference

European Chamber in the Media

President Harborn's comments on Vice Premier Liu's speech at Davos

Chinese President Xi Jinping's top economic aide fails to inspire at World Economic Forum in Davos

China should 'be ready for a trade war' after Donald Trump's Davos speech →

For Mats Harborn, president of the European Union Chamber of Commerce in China, Liu's speech lacked commitment.

"While the European chamber recognises that some important initiatives have taken place in the last year, the direct impact on most foreign businesses has been limited," he said.

"There is a frustrating gap between promises and action. A clear implementation timeline is now required."

European Chamber President Mats Harborn took an interview with the *South China Morning Post* (*SCMP*) where he commented on Liu He's, vice premier of the People's Republic of China, speech at the 2018 World Economic Forum Annual Meeting in Davos, Switzerland. President Harborn went on to say the following:

"For Mats Harborn, president of the European Union Chamber of Commerce in China, Liu's speech lacked commitment. 'While the European Chamber recognises that some important initiatives have taken place in the last year, the direct impact on most foreign businesses has been limited', he said. 'There is a frustrating gap between promises and action. A clear implementation timeline is now required'." (SCMP)

Secretary General Dunnett's Appearance on CGTN's Dialogue

On 25th January, Adam Dunnett, secretary general of the European Chamber, appeared on *CGTN's Dialogue* to discuss the 2018 World Economic Forum Annual Meeting in Davos. He was joined on the programme by He Weiwen, senior fellow at the Centre for China and Globalisation, and Robert Koepp, director of the Economist Network. The panel discussed key issues that emerged from this year's forum. Some of these issues included India's global vision, overcapacity, the rising trend of global protectionism and reciprocity in trade and investment. While there are "certain sectors that still remain closed or restricted [in China]", explained Secretary General Dunnett, these same sectors are open to Chinese companies investing in Europe or the United States.

President Harborn's Interview with Global Times on the Annual Work Report

After Premier Li Keqiang delivered the annual *Government Work Report*, European Chamber President Mats Harborn was invited by the *Global Times* to comment on the report. President Harborn noted the government's planned growth rate of 6.5 per cent and encouraged further opening up and reform in China's economy.

Vice President D'Andrea's Interview with Germany's ARD Radio

Dass ausländische Firmen in China immer noch anders behandelt werden als einheimische, zeige sich auch an ihrer rechtlichen Sonderstellung, beklagt die Europäische Handelskammer: "Chinas Führung betont immer wieder, dass zwischen europäischen und einheimischen Firmen kein Unterschied gemacht werde. Tatsächlich aber ist es so, dass für chinesische Firmen chinesische Unternehmensgesetze gelten. Für ausländische Investoren gelten andere Gesetze", so D'Andrea.

European Chamber Vice President Carlo D'Andrea discussed the 2018 World Economic Forum Annual Meeting in Davos with *ARD Radio*. Vice President D'Andrea outlined what has happened since President Xi Jinping's speech at last year's forum and was critical about the lack of economic reform by China, despite promises to the contrary.

Secretary General Dunnett Discusses Premier Li's Press Conference on CGTN's Dialogue

On 20th March, European Chamber Secretary General Adam Dunnett spoke on *CGTN's Dialogue* where he shared his views on Premier Li Keqiang's press conference held after the *Lianghui's* closing ceremony. Secretary General Dunnett was impressed by Premier Li's commitment to fully opening up the manufacturing sector and keeping the equal market entry standard for foreign and domestic businesses alike.

On the program, Secretary General Dunnett also highlighted the importance of strong European Union (EU)-China relations and highlighted the benefits of working within the World Trade Organization's system. After discussing globalisation in the abstract, he went on to clarify the EU Parliament's approved proposal for new trade defence instruments and the reasoning behind their implementation.

At the end of the segment, Secretary General Dunnett expressed his optimism on the recent ministerial restructuring as consolidation may end up making government bureaucracy more efficient.

EUROPEAN CHAMBER EVENTS GALLERY

BEIJING CHAPTER


1

Car Sharing in China: A Viable Alternative to Car Ownership and Ride Hailing? (1)

On 12th January, the Chamber hosted a seminar on car sharing in China. At the seminar, Ron Zheng, partner and vice president of Roland Berger Greater China, discussed what opportunities were available to foreign businesses in China's automotive market.


2

Capital Beat | China's Central Economic Work Conference: Setting the Direction for Economic Policy in 2018 (2)

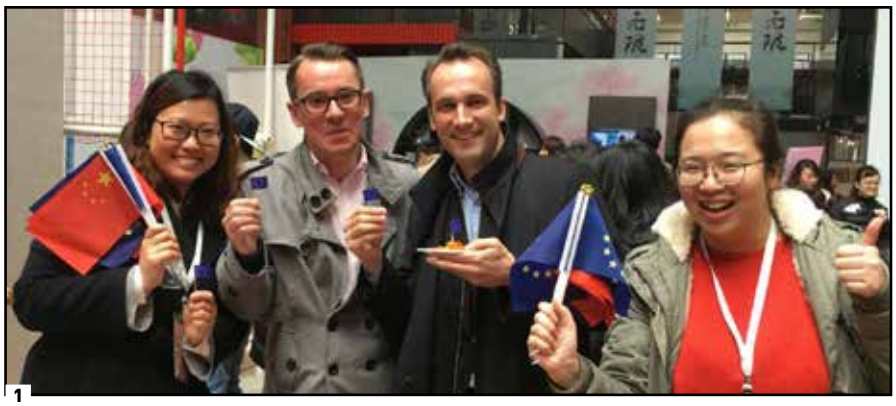
On 17th January, the Chamber held its first event in a series of public affairs meetings titled Capital Beat. This event had Arthur Kroeber, founding partner of Galvekal Dragonomics, and Tom Orlik, chief Asia economist at Bloomberg, share their interpretations on China's 2018 Central Economic Work Conference.


3

US-China Trade Relations in Year Two of the Trump Administration (3)

On 28th February, the European Chamber and AmCham jointly held a seminar on US-China trade relations and discussed the impact trade tensions could have on foreign businesses in China.

NANJING CHAPTER


1

International Food and Culture Festival (1)

On 8th March, the Chamber's Nanjing Chapter and Nanjing Association of Enterprises with Foreign investments jointly held the Nanjing International Food & Culture Festival.

SHANGHAI CHAPTER


1

China's Amended Anti-Unfair Competition Law: Redefining Bribery (1)

On 25th January, the Chamber's Shanghai Chapter welcomed Mike Goldammer and Cara Meng from Taylor Wessing to speak about *China's Amended Anti-Unfair Competition Law*.


2

Lunch and Learn: Waste Management is a Collective Responsibility (2)

On 31st January, the Chapter held its first lunch and learn session in Shanghai on the topic of waste management with collective responsibility.

3

2018 Tax Updates: New Tax Incentives for Reinvestments into China (3)

On 1st February, the Chamber hosted a seminar on what benefits multinational corporations can receive from the *Cai Shui* [2017] *No. 88* tax deferral requirements.

4

Factory Tour to Kuka Robotics: Manufacturing the Future of Robotics (4)

On 6th March, members of the Shanghai Chapter visited Kuka Robotics. During this tour, James Wang, CEO of Kuka Systems China, and Andy Wen, CEO of Kuka Robotics China, shared with participants how industrial robots are manufactured and provided an overview of the sector.

SOUTHWEST CHAPTER

1

Celebratory Cocktail Party (1)

On 17th January, the Chamber's Southwest China Chapter held a Cocktail Party to celebrate the appointment of Filippo Umberto Nicosia to the positon of Italy's Consul General in Chongqing.

2

Chamber Visits Chengdu Hi-Tech Zone (2)

On 9th February, the Chamber's Southwest China Chapter organised a visit to Chengdu's Hi-Tech Zone where members met with officials from Tianfu Hi-Tech Window and Tencent Chendgu.

TIANJIN CHAPTER

1

F&T Discussion Forum Series I: 2017 Activities Review and 2018 Work Plan (1)

On 24th January, the Chamber's Tianjin Chapter held a forum where members aired their grievances and provided suggestions on financial operations in China.

2

HR Practical Training Series I: Risk Management and Practical Drafting of HR Relevant Legal Documents (2)

On 26th January, the Chamber's Tianjin Chapter held the first of a series of human resources training sessions.

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