

# Science, Technology, Education and Health News from China Number 162 – December 2017

Please note that the previous newsletters can be downloaded from the website of the Embassy of Switzerland in China: [www.eda.admin.ch/beijing](http://www.eda.admin.ch/beijing). To subscribe/unsubscribe or send us your comments, please write an email with the corresponding subject to [yijun.wu@eda.admin.ch](mailto:yijun.wu@eda.admin.ch).

## **Introduction**

The story of the month covers China's mobile payment giants forcing incumbents to innovate. In science and technology, China to build national cybersecurity industrial park. 126,000 Beijing households bid farewell to coal stoves in 2017. China moves to boost 3D printing. China counting down to 5G commercialization. China is racing down the path of global digital domination, with Xi Jinping in the driver's seat. China's first domestic large amphibious aircraft makes maiden flight. In health, Shanghai to launch long-term care insurance in 2018. In education, China's fiscal funds for education grew 7.9 percent annually from 2012 to 2016.

## **Contents**

Story of the Month .....	2
1. China to build national cybersecurity industrial park.....	3
2. 126,000 Beijing households bid farewell to coal stoves in 2017 .....	4
3. Shanghai to launch long-term care insurance in 2018 .....	4
4. China moves to boost 3D printing.....	5
5. China counting down to 5G commercialization.....	5
6. China is racing down the path of global digital domination, with Xi Jinping in the driver's seat .....	6
7. China's first domestic large amphibious aircraft makes maiden flight .....	7
8. China's fiscal funds for education grew 7.9 pct annually from 2012 to 2016.....	8

## **Contact**

**Nektarios PALASKAS**

**Science and Technology Counsellor**

**Head of Science, Technology and Education Section**

**Embassy of Switzerland in the People's Republic of China**

Tel: +86 10 8532 8849

Email: [nektarios.palaskas@eda.admin.ch](mailto:nektarios.palaskas@eda.admin.ch)

[www.eda.admin.ch/beijing](http://www.eda.admin.ch/beijing)

*We invite you to follow the Swiss Embassy on Weibo! <http://e.weibo.com/swissembassy>*

*We also invite you to follow Swissnex on Weibo! <http://e.weibo.com/swissnexchina>*

## Story of the Month

### China's mobile payment giants forcing incumbents to innovate

(SCMP, 16-12-2017)

Three years ago cash was still king in China – until Alipay and WeChat Pay shook up the entire ecosystem. Today, their dominance in mobile payments for everything from taxi fares to peer-to-peer transfers have not only made them household names in a country of 1.4 billion people, but incumbent payment operators are being forced to innovate or risk being left behind.

China has embraced mobile payments faster than any other country. Last year, mobile payment transactions hit US\$5.5 trillion, making China the largest mobile payments market in the world, according to iResearch.

Tencent's WeChat Pay, together with Ant Financial's Alipay and its overseas strategic mobile payment partners, claim a total of 600 million and 800 million users respectively.

Combined, they account for over 66 per cent of the third party payments market in China, based on research by Analysys International.

But not satisfied with just dominating the Chinese mainland, both companies have started laying the groundwork to introduce their services to other Asian markets like Hong Kong and Singapore.

"Tencent and Ant Financial are biting at the heels of incumbent payment operators," said Michael Yeo, research manager for financial and retail insights at IDC.

China's monopoly bank card services provider China UnionPay has sat up and taken notice. With only a 17 per cent market share in third-party payments, it has just launched an integrated mobile payments service as it looks to compete head to head with Alipay and WeChat Pay.

The UnionPay QuickPass app supports both near field communication (NFC) technology and QR codes, allowing almost all mainland banks to expand their mobile payments services on a unified platform. But it comes three years after Alipay and WeChat Pay launched "scan to pay" functions and peer-to-peer money transfers in 2014.

"It's a bit late for UnionPay to enter the mobile payments market now, most consumers are used to Alipay and WeChat Pay," said Wang Xiaofeng, senior analyst at Forrester Research. "But UnionPay is not going to just give up the market, they also want to fight for a piece of the pie."

Alipay and WeChat Pay have also made their presence felt abroad. Both companies extended their payments services to hundreds of thousands of merchants in regions like Southeast Asia and Europe, targeting outbound Chinese travellers and encouraging them to settle their overseas shopping bills with the apps.

In the past year, both companies have also focused on rolling out local e-wallet services to other Asia Pacific markets. These apps can be linked to users' bank accounts or topped up manually.

In Hong Kong, Tencent launched its WeChat Wallet feature in January 2016, allowing users to link their credit cards to the wallet, send digital red packets to family and friends, and purchase tickets for local attractions and travel insurance. In a similar move, Ant Financial, the financial arm of Alibaba Group, pushed out a separate, local version of its wallet called AlipayHK for Hong Kong residents in May.

Both companies have moved quickly in an effort to encourage consumer adoption. Last month, both Alipay and WeChat Pay rolled out mobile payment services for Hong Kong taxis, an industry that has long been dominated by cash, introducing a host of incentives including no administration fees to encourage taxi drivers to adopt the system. Within a month, some 2,500 taxis out of the city's fleet of 40,000 signed up.

In contrast, the operator of Hong Kong's ubiquitous Octopus card, used by locals for everything from public transport to cashless payments, has struggled to woo the local taxi industry due to its administration fee charges.

Now WeChat Pay and Alipay have set their sights on the city's MTR subway system, with new partnerships announced in late November that would enable travellers to pay for train tickets with mobile payment wallets at selected MTR stations, thus breaking the two-decade stronghold Octopus had as the main form of payment for MTR fares.

The two Chinese mobile payment wallets have spurred Octopus to take action. Earlier this week it announced it was joining forces with Samsung Pay to enable users to pay for purchases via the NFC function on smartphones.

"We believe Smart Octopus will become the new norm for smartphone users seeking greater convenience while carrying less," said Octopus chief executive Sunny Cheung Yiu-tong, referring to the new system.

Octopus launched its own QR code-based payment service in October, targeted at small merchants and encouraging them to accept mobile payments.

Elsewhere in Asia, payment operators are also scrambling to launch mobile services to fend off competition from Alipay and WeChat Pay.

In Singapore, the two Chinese operators are already working with merchants and local third-party payments providers to let Chinese tourists pay with Alipay or WeChat Pay. In August, local media reports said Ant Financial was still "looking for partners" to potentially launch its wallet service in Singapore. The same month, Singapore Prime Minister Lee Hsien Loong wrote a tweet lamenting the country's fragmented mobile payments system, which was "inconvenient for consumers and costly for businesses".

The island-state already has a host of mobile payment systems from banks such as DBS, as well as from ride-hailing company Grab, which operates GrabPay. Within weeks, local payment services company Nets announced its new NetsPay solution that lets users scan a QR code or go contactless with NFC technology on their mobile phone, with money debited directly from their bank accounts.

US-based hardware gaming firm Razer also jumped on the bandwagon, with Singapore-born chief executive Tan Min-liang promising to submit a proposal for a mobile payments system called RazerPay for the city. In an interview earlier this month, Tan said that plans for RazerPay were still under way and could be expected to roll out "in the short term".

Forrester's Wang said that while local payment operators are moving to innovate and roll out their own services, it could be difficult to compete with Alipay and WeChat Pay.

"If Alipay and WeChat Pay get licenses from regulators and roll out localised versions, they're going to be a huge threat," she said. "It's going to be difficult to compete with them, because they are already so experienced, be it in the technology side or the go-to market strategy in encouraging adoption.

"The biggest difference between tech companies and payments incumbents is speed. When services like WeChat Pay or Alipay enter a market, they move very, very fast. Traditional payments operators or banks just simply do not have the same agility."

At publication time UnionPay, Nets and Octopus had not responded to requests for comment.

<http://www.scmp.com/tech/china-tech/article/2124512/chinas-mobile-payment-giants-forcing-incumbents-innovate>

## News

### 1. China to build national cybersecurity industrial park

*(China Daily, 12-12-2017)*

China will establish a world-class national cybersecurity industrial park to cultivate a 100 billion yuan (15 billion US dollars) cybersecurity industry in Beijing by 2020.

The industrial park will be jointly built by the Ministry of Industry and Information Technology (MIIT) and the Beijing Municipal government.

The park is expected to contribute 330 billion yuan to China's gross domestic product growth and cultivate at least three enterprises with annual revenues exceeding 10 billion yuan by 2020.

Currently, half of China's cybersecurity companies are registered in Beijing, and six of them have over one billion yuan in annual revenue.

In 2016, the scale of China's cybersecurity industry saw an increase of 21.7 percent and it is expected to grow 32.85 percent this year.

(<http://www.chinadaily.com.cn/a/201712/12/WS5a2fc73fa3108bc8c6729c39.html>)

## **2. 126,000 Beijing households bid farewell to coal stoves in 2017**

*(Xinhua, 26-12-2017)*

Another 126,000 households in Beijing can use clean heating instead of dirty coal stoves this year, local authorities said on 26 December.

At a cost of 7.4 billion yuan (1.1 billion U.S. dollars), the city completed 296 projects to switch coal-fired heating to clean energy in rural areas this year, reducing the city's annual coal use by 2.1 million tonnes.

As part of a campaign launched in 2013, Beijing phased out coal-fired heating facilities in 185,000 households across 415 villages, reducing the city's coal use by 18 million tonnes over five years.

Beijing will phase out coal-fired heating facilities in 217,000 households between 2016 and 2020. By shifting to clean fuel, such as electricity and gas, the city can cut emission of carbon dioxide by nearly 600,000 tonnes, particulate matter by 3,700 tonnes and sulfur dioxide by nearly 1,500 tonnes.

Small stoves in Beijing's suburban and rural areas, not covered by the central heating system, have been blamed for worsening the city's smog during the winter.

The consumption volume of natural gas in Beijing has maintained annual growth of 15 percent in recent years, according to Beijing Gas.

Currently, China National Petroleum Corporation, the country's major oil and gas supplier, has six pipelines pumping natural gas to the capital city, and more gas pipelines connecting China and Russia will open by 2020.

These pipelines will bring the annual natural gas supply to Beijing to nearly 120 billion cubic meters.

Beijing is also expanding underground gas storage to reserve 3.85 billion cubic meters of natural gas by 2020.

([http://www.xinhuanet.com/english/2017-12/26/c\\_136853426.htm](http://www.xinhuanet.com/english/2017-12/26/c_136853426.htm))

## **3. Shanghai to launch long-term care insurance in 2018**

*(Xinhua, 26-12-2017)*

Shanghai will launch a long-term care insurance program in 2018, expected to benefit three million elderly people, local authorities said on 26 December.

Shanghai, one of the 15 pilot cities in China to implement long-term care insurance, carried out the program on a pilot basis in three districts of Xuhui, Putuo and Jinshan in 2017.

About 25,000 elderly people applied for care services and 14,000 of them became beneficiaries.

From 2018, urban and rural residents who are aged 60 and older, and are recipients of health care insurance, can participate in the program.

The elderly can receive 42 kinds of care services including personal hygiene services and clinical care at home, hospitals or nursing institutions.

Fees will be largely covered by an insurance premium paid by individuals and the government.

Of the city's registered population, about 4.6 million were over 60 years old at the end of 2016, 31.6 percent of the total population. Those aged 80 and above reached 796,600 as of 2016, accounting for 5.5 percent of the total.

Currently, China has five social insurance programs: elderly care, health care, unemployment, work injury and maternity. They are run by the government and premiums are paid by the individual and the employer on a compulsory basis.

Long-term care insurance is expected to become the sixth.

[http://www.xinhuanet.com/english/2017-12/26/c\\_136853609.htm](http://www.xinhuanet.com/english/2017-12/26/c_136853609.htm)

#### **4. China moves to boost 3D printing**

*(Xinhua, 14-12-2017)*

China has moved to bolster its 3D printing sector with favorable policies from stronger fiscal support to easier financing as it counts on high-tech, emerging sectors to drive the economy.

The government expects the industry to maintain an annual growth rate of more than 30 percent in the coming years and its revenue to top 20 billion yuan (around 3 billion U.S. dollars) in 2020, according to guidelines released on 13 December by the Ministry of Industry and Information Technology (MIIT) and 11 other agencies.

Homegrown core technology will reach international levels at that time, said the guidelines, which aim to foster two or three domestic firms able to take on global rivals with their products recognized in overseas markets.

Specifically, breakthroughs will be made in more than 100 types of technological equipment, key devices and special materials, and more than 100 pilot programs will be launched, according to the official plan. The technology will be widely used in aviation, ship building, car making, health care, culture, and education.

The MIIT promised to increase fiscal support for 3D printing companies, and said it will encourage diverse financing models including going public and issuing bonds. Financial leasing will also be promoted.

Foreign firms will be encouraged to set up research and development centers in China, according to the guidelines.

The market for 3D printing in China is booming as the technology is being tested in nearly all possible applications, from housing to food, clothing and surgery.

[http://news.xinhuanet.com/english/2017-12/14/c\\_136823963.htm](http://news.xinhuanet.com/english/2017-12/14/c_136823963.htm)

#### **5. China counting down to 5G commercialization**

*(Xinhua, 7-12-2017)*

Downloading a 6-gigabyte file in less than two seconds using 5G technology is not a far stretch, as China is preparing for the commercialization of the next generation of mobile communication technology.

During the Fourth World Internet Conference held in Wuzhen, Zhejiang Province, this week, Huawei shared the honors with other tech giants such as Apple, Alibaba, Baidu and Microsoft at the World Leading Internet Scientific and Technological Achievement awards.

Huawei will launch a smartphone which supports 5G communication in 2019 with a self-developed chip, according to Xu Zhijun, rotating CEO of the company.

Currently, 5G standards are still under development by the 3rd Generation Partnership Project (3GPP). Last October, Huawei achieved a speed of 27Gbps in 5G field tests using polar codes for channel coding. Huawei's polar coding was approved as part of the global standards for 5G.

As well as Chinese high-tech companies, its telecom operators are also eager to participate in formulating 5G global standards and promote commercialization.

Bi Qi, chief technical officer at the China Telecom Research Institute, said Chinese telecom carriers have invested heavily in 5G, carrying out tests in several major cities.

China Mobile, the world's largest telecom carrier by subscribers, has been devoted to developing 5G technology, and plans to launch a fully commercialized 5G network in 2020. ( The company will also begin a pre-commercial 5G service next year and deploy more than 10,000 5G base stations by 2020, according to Sha Yuejia, vice president of China Mobile.

The world's largest 5G test field with about 30 telecom base stations has already been established in Beijing's Huairou District. China Mobile, Huawei, ZTE as well as a number of foreign companies have completed China's second phase of 5G testing.

China is expected to be the world's largest 5G market by 2025, according to a report by GSMA Intelligence, a global mobile think tank, and China Academy of Information and Communications Technology (CAICT).

The CAICT predicted that 5G will drive 6.3 trillion yuan (946.8 billion U.S. dollars) of economic output in China by 2030.

Wen Ku, director of the telecom development department at the Ministry of Industry and Information Technology, said China has started its third phase of 5G technical tests, and will increase efforts on network planning, systems, chips and other products to get pre-commercial 5G service ready as soon as possible.

Global telecom carriers will invest 3.3 trillion yuan in mobile infrastructure by 2020, said John Hoffman, CEO and director of GSMA, adding that up to 500 billion yuan will come from China.

According to a Qualcomm report, the emerging 5G mobile communications technology is expected to generate 3.5 trillion U.S. dollars of output and 22 million jobs in the global telecom industry by 2035.

[http://news.xinhuanet.com/english/2017-12/07/c\\_136808018.htm](http://news.xinhuanet.com/english/2017-12/07/c_136808018.htm)

## **6. China is racing down the path of global digital domination, with Xi Jinping in the driver's seat**

*(SCMP, 9-12-2017)*

China's government will allocate more resources toward the implementation of big data analysis and digitalising the world's second-largest economy, part of a US\$150 billion strategy to turn the nation into the global innovation hub for artificial intelligence by 2030.

"China should speed up its effort to improve our digital infrastructure, promote the integration and sharing of digital resources, protect data security to better serve the nation's economic and social development, as well as improve people's lives," President Xi Jinping said during a meeting of the Communist Party's political bureau, or Politburo on 8 December, according to a Xinhua News Agency transcript.

By leading the party's top decision-making body in a meeting on big data, Xi - China's most powerful state leader in generations - is putting his personal imprimatur on the government's strategic push, underscoring his determination to drive for results. Less than two months earlier before he was confirmed in his second five-year term as China's

president at the party's congress, Xi had called for advanced technologies to be "embedded" into the real economy to foster growth.

Known among technologists and economists as the "fourth industrial revolution," artificial intelligence, robotics and big data may bolster the global economy by a further 14 per cent by 2030 – the equivalent of an additional US\$15.7 trillion in value – and China will see an estimated 26 per cent boost to its economic output, PwC said in June.

"China should lay out our digital master plan early and strive to take the initiative," Xi said on 8 December, according to Xinhua. "We [should] aim for world class, cutting-edge technologies, and nurture a group of big data companies."

China's 2016 spending on technology research and development rose 10.6 per cent to 1.57 trillion yuan (US\$237 billion), equivalent to 2.1 per cent of the economy's output, according to the National Bureau of Statistics data. The figure exceeded the average of 2.08 per cent for the European Union.

Digitalisation has given China's economy a shot in the arm, especially in the country's booming development of e-commerce. The country has already leapt ahead of Europe, North America or Japan in cashless payments and online commerce.

China already has 42 per cent share of the world's e-commerce transactions, processing US\$790 billion in 2016, or 11 times more than mobile payments in the US, according to McKinsey's data.

E-commerce and e-payment have already become the beacons of the digital era with China's three largest internet companies – Baidu, Alibaba Group Holding and Tencent Holdings – increasingly wielding their influence over China's business activities and daily lives. Alibaba owns the South China Morning Post.

Still, China lags behind the US in the application of digital technologies in traditional sectors, especially in transport and logistics, agriculture, real estate and construction.

Beijing is looking to slash about 1 trillion yuan in national logistics costs by 2020, pinning hope on the latest digital technologies to enhance the efficiency of transport and delivery services.

China has more than 8 million logistics firms, more than 90 per cent of which are small-scale and individually owned.

Inefficient management at the transport businesses have been weighing on the economy, which passes huge logistics costs on to Chinese-made products, squeezing their profits and making it hard for them to sell.

<http://www.scmp.com/business/companies/article/2123625/china-racing-down-path-global-digital-domination-xi-jinping>

## **7. China's first domestic large amphibious aircraft makes maiden flight**

*(Xinhua, 24-12-2017)*

China's first large amphibious aircraft AG600 on Sunday completed its maiden flight in south China's Guangdong Province.

At 9:39 a.m., the aircraft AG600, code named "Kunlong," left Jinwan airport in the city of Zhuhai. The flight lasted about one hour.

"The maiden flight makes China among the few countries capable of developing a large amphibious aircraft," said Huang Lingcai, chief designer of AG600.

The Communist Party of China Central Committee and the State Council congratulated all those engaged in the mission, including those from the Ministry of Industry and Information, the Civil Aviation Administration of China and the Aviation Industry Corporation of China (AVIC).

The congratulatory message said that the maiden flight was a major breakthrough in developing special-purpose aircraft following the maiden flight of the large C919 passenger jet in May.

Its name "Kunlong" stands for a high expectation in Chinese culture with the "kun" meaning an enormous legendary fish and "long," a dragon.

"It has taken eight years to develop the aircraft. It is the result of several generations of Chinese aviation work," said Huang.

The 36.9-meter aircraft is powered by four domestically-built turboprop engines, according to its developer the AVIC. Aviation engines have long been a problem and the AG600 engine is a major step forward.

With a maximum take-off weight of 53.5 tonnes and a maximum cruising speed of 500 kilometers per hour, the AG600 has a range of 12 hours.

Designed to be the world's largest amphibious aircraft, the AG600 will be mainly used for maritime rescue, fighting forest fires and marine monitoring.

It can carry 50 people during search-and-rescue missions, collect 12 tonnes of water in 20 seconds for fire fighting and transport up to 370 tonnes of water on a single tank of fuel.

"Its operational range of more than 4,000 km and ability to land on and take off from water put China's islands in the South China Sea well within range," said Huang.

China released a guideline on large aircraft projects in 2006 which has resulted in three large aircraft models.

In 2013, transport aircraft Y-20 made maiden flight and entered into service with China's air force in July 2016.

In 2017, China's first domestically-produced large passenger aircraft C919 completed first flight, allowing China entry in a civil aviation market currently monopolized by the Airbus and Boeing.

The AG600 is the third.

"Its successful maiden flight helps China enter the global aviation industry chain," said Chen Mingsheng, one of the designers of the AG600.

The aircraft has already received 17 orders due to its multiple uses and advanced manufacturing technique.

([http://www.xinhuanet.com/english/2017-12/24/c\\_136849183.htm](http://www.xinhuanet.com/english/2017-12/24/c_136849183.htm))

## **8. China's fiscal funds for education grew 7.9 pct annually from 2012 to 2016**

*(Xinhua, 23-12-2017)*

China's fiscal funds for education in 2016 stood at 3.1 trillion yuan (480 billion U.S. dollars), with an average annual increase of 7.9 percent from 2012.

The ratio of the funds to GDP exceeded 4 percent each year during the period, according to a State Council report released on Saturday.

"Overall funds for education in 2016 reached 3.9 trillion yuan, over 80 percent of which were provided by the government," said the report delivered to the Standing Committee of the National People's Congress (NPC) at its six-day bimonthly session.

Over half of the fiscal funds for education were used for nine-year compulsory education in 2016. Teacher salaries and student financial aid accounted for over half of the fiscal funds for education in 2016, 10.6 percentage points up from 2012, said the report.

Fiscal funds for education transfer payment inclined toward relatively backward areas in 2016, with 84 percent going to central and western regions, which have fallen behind the east.

Compared to 2012, education funds for every junior middle school student, elementary school student and kindergarten kid in rural areas increased in 2016 by over 50 percent on average, said the report.

In 2016, the gross enrollment rates for the pre-school education reached 77.4 percent, 87.5 percent for senior middle schools, and 42.7 percent for higher education. The net enrollment rate for elementary schools was 99.9 percent, said the report.

Over 80 percent of children of migrant workers received education in cities where their parents work.

Since 2012, 698 billion yuan of financial aid has been granted to students from impoverished families.

According to the report, the government will continue to give priority to education. Fiscal funds for education will continue to rise, while society is encouraged to invest more in non-public education.

The focus of fiscal funds for education will shift toward rural areas, old revolutionary bases, ethnic minority areas, and border areas. The integrated development of compulsory education between urban and rural areas need to be strengthened, said the report.

Pre-school, special and online education should be improved. Vocational education and training systems will be optimized. More junior middle school graduates will be encouraged to go to upper middle school, said the report.

([http://www.xinhuanet.com/english/2017-12/23/c\\_136847537.htm](http://www.xinhuanet.com/english/2017-12/23/c_136847537.htm))