

Science, Technology, Education and Health News from China

Number 160 – October 2017

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Introduction

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Story of the Month

Alibaba to spend more than US\$15bn on technology research with launch of collaborative academy

(SCMP, 11-10-2017)

Alibaba Group has pledged to spend more than US\$15 billion on research and development over the next three years – a big step-up by the e-commerce juggernaut whose market cap now stands side by side with Amazon.

Through the Alibaba Damo Academy, its first global initiative in technology collaboration, the company aims to bankroll some of the most frontier research, ranging from data intelligence, internet of things and fintech to quantum computing and human-machine interaction.

“We are now looking for talented researchers to join us in the quest for original and disruptive technologies that will ultimately change the world,” Jeff Zhang, the group’s chief technology officer, said during an announcement at the Alibaba Computing Conference, held at the group’s headquarters in Hangzhou, on 11 October.

Alibaba will open seven research labs in Beijing, Hangzhou, Singapore, Moscow, San Mateo and Bellevue in the United States and Tel Aviv as part of the project. These will focus on areas that include machine learning, network security, visual computing and natural language processing.

Zhang will head the Damo – or Discovery, Adventure, Momentum and Outlook – Academy, which is looking to recruit 100 talented researchers from around the world.

“The Alibaba Damo Academy will be at the forefront of developing next-generation technology that spurs the growth of Alibaba and its partners,” said Zhang.

The decision comes months after Alibaba’s executive chairman, Jack Ma, vowed to double down on research, figuratively upgrading his team from a workshop making “hand grenades” into one “developing missiles”.

Ma said that thanks to the talent and technology China boasts, the academy is positioned to overtake research facilities built by IBM, Microsoft and Intel as the global leader in technology research.

But rather than seeing the academy as a technology powerhouse driving business growth at Alibaba, Ma said it would also contribute to “society and the era”.

“The technologies development from Damo Academy is expected to serve at least 2 billion consumers around the world and help Alibaba create 100 million jobs worldwide by 2036,” he said.

Ma aims to make Alibaba the world’s fifth-largest economy in the next 20 years. And to reach that goal, the group must build on the continuing development of technological infrastructure, he added.

The move marks a big step up in research spending – the company reported a product development expense of US\$2.48 billion in the fiscal year ending in March 2017, a 24 per cent increase from a year ago.

While the group did not disclose overall research costs, payroll and share-based compensation towards development accounted for 11 per cent of total revenue, according to Alibaba’s annual report.

“At its core, Alibaba is a technology company. As recent financial results show, staying ahead of the curve in areas such as artificial intelligence and machine learning has been positive,” said Kirk Boodry, an analyst with the UK-based equity and debt research firm New Street Research.

Alibaba, the operator of the world’s largest online shopping platform, has been driving China’s AI programme together with its two biggest rivals, Baidu and Tencent Holdings, catching up with the US in investing in machine learning and natural language processing.

The Damo Academy announcement comes as the group's shares rose for eight trading days in New York to a record high, surpassing Amazon at one point on 10 October to become the world's biggest e-commerce company by market cap.

"Research and development for internet of things and fintech helps with monetisation and business expansion, whilst spending on quantum computing and human-machine interaction could also be defensive as disruption from these technologies could be higher," Boodry said.

<http://www.scmp.com/business/article/2114853/alibaba-spend-more-u15bn-technology-research-launch-collaborative-academy>

News

1. FAST telescope finds pulsars during trial operation

(Xinhua, 10-10-2017)

After one year of trial operation, China's Five-hundred-meter Aperture Spherical Radio Telescope (FAST), the world's largest single-dish radio telescope, has identified multiple pulsars, the National Astronomical Observatories of China (NAOC) said on 10 October.

It was the first time a radio telescope independently developed by Chinese scientists has found pulsars.

Two of the pulsars, named J1859-01 and J1931-01, are 16,000 light years and 4,100 light years from Earth with rotation periods of 1.83 seconds and 0.59 seconds, respectively.

According to Li Di, chief scientist at the radio astronomy division of the NAOC, the two pulsars were discovered on Aug 22 and 25 when FAST was drift-scanning the southern galactic plane. The discovery was later confirmed by the Parkes radio telescope in Australia in September.

Li said FAST has already detected dozens of promising pulsar candidates, six of which had been confirmed by international organizations.

Peng Bo, deputy director of the FAST project, said three to five years of trial operation is usually required for a radio telescope as large and complicated as FAST.

"It is truly encouraging to have achieved such results within just one year," said Peng.

Located in a naturally deep and round karst depression in southwest China's Guizhou Province, FAST was completed in September 2016.

Its receiving area is equivalent to about 30 football fields.

Astronomers are able to use FAST to survey hydrogen in the Milky Way and other galaxies, detect thousands of new pulsars and study the origin and evolution of the universe.

Over 2,700 pulsars have been identified since the first one was discovered by British astronomers Jocelyn Bell Burnell and Antony Hewish on Nov 28, 1967. But almost all of them are within the scope of the Milky Way.

Many scientists expect FAST to be the first telescope to capture a pulsar outside the galaxy.

Technical preparations have been made for FAST to search for pulsars outside the Milky Way as early as next year.

FAST is believed to be the world's most sensitive radio telescope. Engineers have said it is so sensitive it could capture the signal of a cell phone being used on the moon.

Before the completion of the Square Kilometer Array (SKA) telescope, funded by a consortium of countries, FAST will remain the global leader for the next 10 to 20 years.

The telescope is expected to discover twice the number of pulsars currently known and it is highly likely to make breakthroughs in the study of gravitational waves and general relativity theory, said Sun Caihong, its deputy chief technologist.

FAST's other tasks include exploration of interstellar molecules and communication signals, as well as building an accurate picture of the universe.

"FAST is going to become central in developing a new map of our universe that is going to be used for all sorts of science. It will probably be many decades before a better map is created," said Marko Krco, a visiting U.S. astronomer at the NAOC.

http://news.xinhuanet.com/english/2017-10/10/c_136669827.htm

2. Chinese scientists make breakthrough in replacing WiFi with LiFi

(Xinhua, 3-10-2017)

Chinese scientists have made a breakthrough in creating full-color emissive carbon dots (F-CDs), which brings them one step closer to developing a faster wireless communication channel that could be available in just six years.

Light Fidelity, known as LiFi, uses visible light from LED bulbs to transfer data much faster than radio wave-based WiFi.

While most current research uses rare earth materials to provide the light for LiFi to transmit data, a team of Chinese scientists have created an alternative -- F-CDs, a fluorescent carbon nanomaterial that proves to be safer and faster.

"Many researchers around the world are still working on this. We were the first to successfully create it using cost-effective raw materials such as urea with simple processing," said Qu Songnan, an associate researcher at Changchun Institute of Optics, Fine Mechanics and Physics, the Chinese Academy of Sciences, which leads the research.

Qu said rare earth has a long lifespan which reduces the speed of LiFi transmission. However, F-CDs enjoy the advantage of faster data transmission speeds.

In previous studies, carbon dots were limited to the emission of lights such as blue and green. The new nanomaterial that Qu's team has developed can emit all light visible to the human eye, which is a breakthrough in the field of fluorescent carbon nanomaterial.

Qu said this is significant for the development of LiFi, which he expects to enter the market in just six years.

A 2015 test by a Chinese government ministry showed that LiFi can reach speeds of 50 gigabytes per second, at which a movie download can be completed in just 0.3 seconds.

http://news.xinhuanet.com/english/2017-10/03/c_136656364.htm

3. China's CASIC eyes space communications market

(China Daily, 30-10-2017)

China Aerospace Science and Industry Corp is looking into setting up a satellite company to tap the space-based communications market, a company insider has revealed.

Tan Qianhong, Party chief of China Space Sanjiang Group, a CASIC subsidiary in Hubei province, said Sanjiang has submitted a plan for the satellite company to its parent and is waiting for approval.

The new entity will focus mainly on the research, development and launch of small satellites that will operate in low orbits and provide narrowband communication services, Tan said on the sidelines of the 19th CPC National Congress.

"President Xi Jinping has stressed that China's modernization drive will not succeed without the completion of informatization," he said. "Space-based infrastructures are a pillar of the information industry. The new company will be tasked with forming a satellite constellation to boost space-based communications."

The network will offer coverage to users at sea or in remote regions that currently have poor access to ground-based communication services, according to Tan. He said the proposed company will have a team of satellite designers, but added that it will also buy satellites if they have a better cost-performance ratio.

http://www.chinadaily.com.cn/china/2017-10/30/content_33901170.htm

4. China to create gigantic DNA database

(Xinhua, 31-10-2017)

A super-sized DNA sequencing platform will be built in Nanjing, capital of east China's Jiangsu Province, in order to create a genetic information database for ethnic Chinese, according to the provincial health authority.

The DNA project is part of the National Health & Medicine Big Data (Nanjing) Center, a six-billion yuan project under construction in Nanjing's Jiangbei New Area, said Lan Qing, deputy director of the provincial health and family planning commission.

During the first phase, health and medical information on about 80 million people, the equivalent of the population in Jiangsu, will be stored at the center, Lan said.

"When the facilities are ready, the designed capacity for DNA sequencing will be up to 400,000 to 500,000 samples per year," he said.

The DNA sequencing project will be jointly undertaken by the state-owned Yangzi Group, Southeast University and Nanjing Medical University.

Researchers will then use big data created in the database to study genetic mutations related to major diseases, look for the impact of interaction between genes and environmental concerns on human health, and provide statistical support for diagnosis and treatment of major diseases, Lan said.

Cai Long, board director of Yangzi Group, said the program will focus on population genetics, newborns, childhood brain and cognitive development, cancer, and rare and chronic diseases.

The database is expected to be complete in around four years, he said.

http://news.xinhuanet.com/english/2017-10/31/c_136717139.htm

5. Hospitals to reform for better care

(China Daily, 10-10-2017)

Premier says changes will be good for public well-being and the economy.

China will carry out reforms at public hospitals to optimize medical care resources, according to a decision made at a State Council executive meeting chaired by Premier Li Keqiang on 9 October.

Reforms in the pricing of medical services will continue to move toward dynamic price adjustments to better reflect the expertise of medical workers, the panel determined.

One or two cities in provincial areas where the comprehensive medical reforms are being piloted will be chosen for medical insurance payment reform, covering all medical care institutions and services. The government will also designate more than 100 disease categories for an insurance payment-by-category reform.

"The medical care reform is not only a major project to improve public well-being but also a major economic measure," Li said.

He said the public hospital reforms should be pushed forward across the board, and the reforms of medical care partnerships should be piloted in multiple forms to better serve "healthy China" with better and more convenient healthcare services.

China's medical care reforms should adhere to the principle of guaranteeing basic healthcare, building up working mechanisms and strengthening community health services, he said.

China began its latest round of healthcare reform in 2009, with a core objective of offering healthcare services to all people.

As of September, all public hospitals in China had joined the comprehensive reform program, which ends the 60-year-old practice of drug price markups and enables rationalization of medical costs. As reforms have proceeded, drug sales as a share of total revenue for hospitals dropped from 46.3 percent in 2010 to 38.1 percent in 2016.

Public hospitals (12,708 of them as of 2016) provided 2.85 billion diagnoses and treatments last year, accounting for 87.2 percent of cases provided by all hospitals in China, according to the National Health and Family Planning Commission.

Reforming how medicines are acquired for patients will also be deepened, and public hospitals will be encouraged to practice category-based pharmaceutical procurement.

Hospitals across different regions, along with specialized hospitals, will be encouraged to team up for drug procurement.

The public hospital oversight mechanism will be reformed to better supervise the quality and safety of medical care, medical services and medical expenses. The number of hospital beds, construction standards and procurement of large medical equipment will undergo greater scrutiny.

"Medical care reform is still an ongoing reform, and the progress needs to be consolidated," Li said. "The government should provide appropriate financial support."

The executive panel on 9 October decided to speed up efforts to establish medical treatment partnerships to promote effective cooperation and coordination between different types of medical institutions, including major hospitals and grassroots clinics.

All major public hospitals must join in the development of such partnerships before the end of October. The operating mechanism of medical partnerships will be further improved to ensure better coordination in technical support, staffing, staff salary arrangements and resource sharing among different medical institutes.

Private medical care facilities, eldercare facilities and rehabilitation centers will also be encouraged to join the partnerships to provide integrated services to the public.

More efforts will be made to expand the availability of family doctors, and to enable the doctors to offer more services based on demand and improve fee collection and payment mechanisms.

"A lot can be done to advance China's medical equipment and pharmaceutical industry, not least traditional Chinese medicine, and including Internet-Plus medical care that can help better consolidate our resources," Li said.

(http://www.chinadaily.com.cn/china/2017-10/10/content_33058425.htm)

6. Ministry of Education advises practical courses for key socialist values

(Global Times, 30-10-2017)

China's Ministry of Education (MOE) has announced guidelines for practice classes for primary and middle school students and is asking schools to cover traditional culture, revolutionary education and national security education.

The Ministry's Primary and Middle School Students Comprehensive Practice Class Guidelines, which came out on 30 October, recommends 152 practice course topics, another of which is environmental education, China News Service has reported.

"The reason for providing practical class topics to schools is to help them follow central government requirements since the Communist Party of China (CPC) and all of society are paying closer attention to education, including traditional culture, revolutionary tradition, national security, rule by law, and the environment ... to better guide schools in teaching practical classes," the ministry noted.

All of this accords with the requirements in the 19th National Congress of the CPC report, which said that a greater effort is needed in improving students' practical education, said the ministry.

The guidelines note that the goal of the practice classes is to help students better understand socialist values, to love the CPC and the country, and to gain a sense of responsibility and better creativity.

"Educational themes, including revolutionary education, are a way to make students aware of the right values in accordance with the key values of the CPC," said Chu Zhaohui, a researcher at the National Institute of Education Sciences, in speaking with the Global Times.

National security education is expected to include the country's development, its history, and its heritage, Chu said, adding that promoting CPC key values is crucial for the country's development.

The MOE is also asking schools to organize guideline study sessions for teachers, to provide training sessions and equipment for classes on practical skills and to cooperate with other schools and relevant organizations.

<http://www.globaltimes.cn/content/1072697.shtml>)

7. World's first driverless Autonomous Rail Rapid Transit system launches in China

(Xinhua, 24-10-2017)

The world's first driverless Autonomous Rail Rapid Transit system started a test run in the city of Zhuzhou in central China's Hunan Province on 23 October.

The electric vehicles run on an Autonomous Rail Rapid Transit, an urban transport system that has been described as a cross between a bus, train and tram.

The three-carriage vehicle is 32 meters long, has a maximum speed of 70 km per hour and can carry up to 300 passengers. Equipped with sensors, it can read the dimensions of a road.

Currently it travels on a 3.1-km route with four stations, between Shennong Theater and a sports center.

A 9 km long route is also being planned, which will link with the current one to form a loop.

The system and vehicle were developed by the research arm of CRRC Zhuzhou Locomotive, which produces key parts for China's high-speed railway.

Feng Jianghua, chief engineer and vice general manager of the CRRC Zhuzhou subsidiary, said the vehicle had successfully undergone 24 hours of non-stop road tests.

The self-driving system comes as a three-carriage or five-carriage unit. The vehicles can travel for 25 km after a 10-minute charge.

The three-carriage unit will be put into regular service from next year.

The developer said that the system cost just one-fifth a traditional tram system that was priced at 150 million yuan (22.6 million U.S. dollars) to 200 million yuan for each kilometer of the route.

http://news.xinhuanet.com/english/2017-10/24/c_136702282.htm

8. Alipay and WeChat Pay push payment services to taxis outside the mainland

(SCMP, 31-10-2017)

Alipay and WeChat Pay, China's two dominant mobile payment platforms, are ratcheting up their expansion plans through separate initiatives that will allow taxis outside the mainland to accept digital payments from Chinese travellers using these services.

Alipay, which counts more than 520 million active users, aims to make taxi payments easier for mainland tourists visiting the United States through its strategic partnership with electronic payment transactions specialist Verifone, Alipay North America president Souheil Badran told the South China Morning Post.

In Hong Kong, both Alipay and Tencent Holdings-backed WeChat Pay have made separate announcements to extend use of their mobile payment services to local taxis.

"We believe that by simplifying the payment process, we will help increase use of the transport system in the US for the growing Chinese tourist population," said Badran.

"Paying for taxis can be one of the most stressful elements of travelling abroad, particularly if you don't speak the language."

A unit of Ant Financial Services Group, Alipay recently extended its global partnership with Verifone to allow mainland consumers travelling in New York and Las Vegas to pay for taxis using Alipay's mobile wallet function.

Verifone first started working with Alipay last year to equip selected retailers across North America and Europe with a mobile point-of-sale system that accepts Alipay app payments at their stores.

That was designed to help accommodate around 100 million mainland consumers who annually travel abroad in making convenient, electronic purchases at these merchants.

"Alipay and Verifone are exploring additional opportunities to bring Alipay to more taxis in North American cities popular with Chinese travellers," said Badran, who estimated that more than three million mainland visitors will visit the US this year.

"Our research shows that the top 10 destinations for Chinese tourists in the US are New York, Los Angeles, San Francisco, Las Vegas, Washington DC, Chicago, Boston, Philadelphia, New Jersey and Seattle."

At the end of October, 2,100 taxis in Las Vegas accepted Alipay as fare payment. An additional 14,000 taxis in New York City are expected to accept it in November.

"The rising middle class in China will reach 600 million consumers by 2022," said Badran. "By that time, China will be the top overseas origin market for the US tourism industry."

Launched in 2004, Alipay has evolved from a digital wallet used to make e-commerce payments on the mainland to a lifestyle enabler that is used to hail a taxi, book a hotel, buy cinema tickets or pay utility bills directly from within the app, according to Ant Financial, an affiliate of Alibaba Group Holding. New York-listed Alibaba owns the South China Morning Post.

WeChat, Tencent's mobile messaging service that has evolved into the mainland's largest social network and popular online payments platform, on 31 October announced its WeChat Pay HK service can now be used to pay for taxi fare and settle bills in the city.

Norman Tam, the general manager of Tencent's international business group, said more than 1,000 taxis will accept WeChat Pay by the end of this year.

Marketed as Weixin on the mainland, WeChat had 963 million monthly active users as of June 30.

Local trade group the Association of Taxi Industry Development has estimated that there are 18,000 taxis operating in the city.

"We often see passengers run out of cash on taxi rides," said association chairman Chan Man-keung. "With WeChat Pay HK, this pain point can be addressed with a new payment option for taxi fares."

On 30 October, Alipay announced a partnership with Hong Kong mobile payment system developers YedPay and Valoot Technologies to enable taxis in the city to accept fare settlement via Alipay and AlipayHK, which is a venture backed by Li Ka-shing's CK Hutchison Holdings.

Paul Haswell, a partner at international law firm Pinsent Masons, said the growing adoption of both Alipay and WeChat Pay "will make it easier in future to open up these services to non-mainland users".

"This is crucial to Alipay and WeChat's plans for international acceptance," said Haswell.

(<http://www.scmp.com/tech/apps-gaming/article/2117834/alipay-wechat-pay-push-digital-payment-services-more-us-taxis>)