

Technology Market Scan

ASIA-PACIFIC

Asian companies drive growth in global R&D budgets

Asian companies outside Japan have more than quadrupled their research and development budgets in the last decade with investments in artificial intelligence and information technologies, spearheading a move into a new industrial era. South Korea's Samsung Electronics ranked third in the world for R&D spending, quadrupling its budget since 2007. China's Alibaba said in October that it will invest \$15 billion over the next three years to build research hubs in China, the U.S., Russia, Singapore and Israel. The spending, which for a single year would be double what it spent in 2017, is aimed at accelerating research in AI and the "internet of things."

U.S. companies increased R&D spending by 86% and are still leaders in AI and IT investment. But the ranks of the biggest U.S. spenders on innovation has changed as technology brands displace automakers like General Motors and drugmakers like Pfizer. Amazon.com had the world's largest R&D budget at \$22.6 billion, a 28-fold jump from 10 years earlier. It expanded its AI development team to 5,000 people last year from 1,000 in 2016 as it conducts experimental research on smart speakers

and unmanned convenience stores. Apple ranked seventh in the world at \$11.5 billion, a 15-fold increase over the same stretch. It opened a research facility in Japan last year.

Corporate Japan's R&D spending, meanwhile, rose just 12%. Only 17 companies represented the nation in the top 100 budgets last year, down from 24 in 2007. Toyota slid to tenth from third after increasing investment only 26%. Japanese electronics makers have actually curbed investment, with Panasonic falling to 36 from 15 in the rankings and Sony to 35 from 18. Electronics makers have retreated from fields that require significant R&D costs like mobile phones and semiconductors while concentrating on the internet of things instead to narrow their budgets.

<https://asia.nikkei.com>

CHINA

Inclusive finance innovation

Favorable policies and technological advancement have been great accelerators for innovation in China's inclusive finance sector during the past few years, according to a recent industry report. The country's inclusive finance industry has seen increasingly rich products and services, more diversified participants, rapid development of digital financing and innovative and sus-

tainable business models. The report was jointly released by the National Institution for Finance and Development, the National Public Information Platform for Party Media and WeBank, China's first online-only lender.

Back in 2016, the State Council rolled out plans to promote the country's financial inclusion development and, in 2017, the top banking regulator released guidelines to boost large and medium-sized banks to set up inclusive finance divisions. To better cater to the financial needs of customers like blue-collar workers, self-employed business and people living in remote and undeveloped areas, industry players like Shenzhen-based private commercial lender WeBank have introduced various targeted products like "micro loans."

The amount of small loan products is set between 20,000 yuan (US\$2,925) and 200,000 yuan, which does not require guarantees or collateral and can be repaid at any time. By relying on technologies such as big data, blockchain and cloud computing, WeBank is able to control default risks by gathering users' information for credit assessment, making it a reality for the masses to benefit from inclusive finance.

Li Nanqing, president of WeBank, said that inclusive finance has extensive and profound connotations, with "equitable access" being its essence. Last November, the bank unveiled its first product aimed at helping small and micro businesses in Shenzhen. Ping An Puhui, a consumer finance arm of the Chinese insurance giant Ping An Group, is another front-runner in offering innovative services for financial inclusion. The company exports credit auditing and consulting services to credit providers and funders and provides diversified loan service solutions for borrowers, the report said.

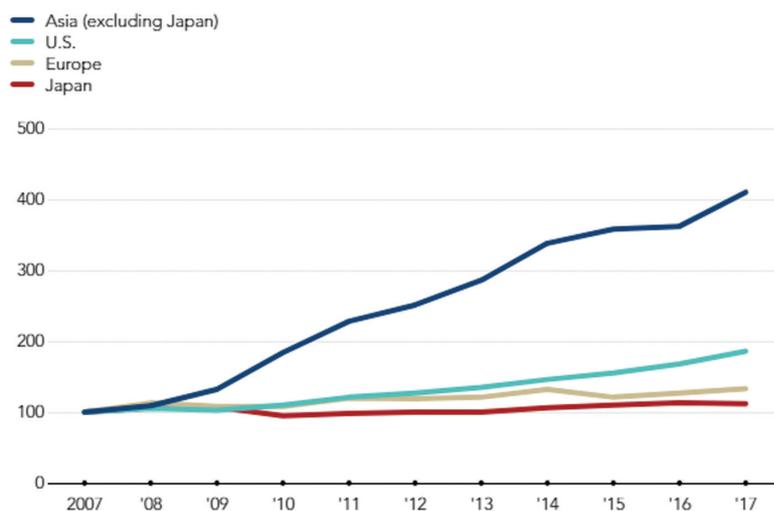
<http://www.ecns.cn>

Technology drives economic growth

According to Xinhua news agency, key economic indicators for this year's January to May period showed that the Chinese economy has been expanding in a steady manner with new impetus for so-called "high-quality development". Latest economic data from the National Bureau of Statistics (NBS) of

Asian companies' R&D spending is growing sharply

(index with base year 2007 set at 100)



Total R&D outlays by companies in each region.

Source: Compiled using data from QUICK-Factset

China showed that China's industrial output has expanded 6.8% year-on-year in May, 0.3% points higher than the same period last year, while the figure for the first five months came in at 6.9%, also faster than 2017.

The sector-by-sector breakdown of the NBS figures also serves to indicate changes in the country's economic structure and points to emerging industries. According to Mr Wen Jianwu, Head of NBS's department of Industrial Statistics, industrial output of high-tech and equipment manufacturing sectors grew 12% and 9.3% respectively in the first five months of 2018.

NBS data also showed that the information communication, software and information technology services sectors registered growth above 30%. At the same time, according to Mr Zhang Liqun, researcher with the State Council's Development Research Centre, production of new energy vehicles, integrated circuits, and robots grew by 56.7%, 17.2%, and 35.1% respectively in May alone. He said that these figures are a testimony to the effectiveness of China's ongoing supply-side structural reform.

According to *Xinhua*, "high-quality development means the Chinese economy will focus on quality and efficiency rather than pace, and medium-to-high growth will feature an improved economic structure and new growth engines". Fuelled by rapidly expanding internet and big data industries, the Chinese server market has become the main driving force behind a strong global recovery, with sales up 67.4% year on year in the first quarter.

Emerging service industries, led by internet-related sectors, contributed 56.8% to the growth in service sector production last month, 17.9% points higher than the same period last year, according to Mr Xu Jianyi, Head of the NBS Service Industry Department.

<https://www.opengovasia.com>

10.6 patents per 10,000 citizens

Some 1.47 million patents have been registered in the Chinese mainland, or 10.6 patents for every 10,000 citizens, the State Intellectual Property Office said. In the first

half of this year, the applications for invention patents reached 751,000, of which 217,000 have been granted, the office said.

Strengthened intellectual property right (IPR) protection led to a 29.5 percent year on year increase in IPR administrative cases in the same period.

Domestic enterprises made up the majority of patent granted and owned, at 63.8 percent and 67.2 percent respectively. However, China still lags behind developed countries in the number of patents in fields such as optics, electrical apparatus, audio and video, medical technology, transportation and computers, according to Bi Nan, an official with the office.

<http://www.xinhuanet.com>

INDIA

WIPO internet treaties approved

On July 4, India's cabinet approved the country's accession to the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty (the WIPO internet treaties). By doing so, India will be able to provide international copyright protections to local creative content-makers and distributors in the internet and digital realm, granting them exclusive economic and publishing rights. Beneficiaries include the audiovisual, film, music, and literary industries. Accession to the WIPO internet treaties also levels the playing field for Indian creative rights-holders in other countries as it harmonizes India's intellectual property (IP) regime with international standards. Since India already protects the rights of foreign content creators, the absence of reciprocal protections was hurting domestic artists.

India's creative industry is currently projected to earn revenues worth US\$25.4 billion by the end of 2018. A stronger IP regime will boost industry growth and safeguard local artists and content makers and distributors from losses due copyright infringement and piracy.

The WIPO Copyright Treaty is a special agreement under the Berne Convention (for protection of literary and artistic works). Its provisions recognize specific copyrights

protections for the digital environment. So far, 96 countries have adopted the treaty; it came into force on March 6, 2002. The WIPO Performances and Phonograms Treaty came into force on May 20, 2002 with 96 contracting parties as its members.

WPPT provisions identify the rights of two kinds of beneficiaries in the digital environment:

- Performers (actors, singers, and musicians, among others); and
- Producers of Phonograms (sound recordings).

WPPT recognizes the copyrights of performers of original content and their exclusive economic rights.

<https://www.india-briefing.com>

Royalty payments for technology transfer

The government is considering restrictions on royalty payments for technology transfer in view of excessive outflow of such funds to overseas companies, sources said. The commerce and industry ministry has proposed limits on royalty payments in case of technology transfer or collaboration involving foreign entities either directly or indirectly through any firm in India. The proposal will be circulated for inter-ministerial views, the sources said.

As per the proposal, such payments should be capped at 4 per cent of domestic sales and 7 per cent of exports for the first four years; and for the next three years the limits should be 3 per cent of local sales and 6 per cent of exports. For further three years, these payments should be capped at 2 per cent of domestic sales and 4 per cent of exports and thereafter at 1 per cent of local sales and 2 per cent of exports. With regard to use of trade mark and brand names, the ministry has proposed to cap royalty payments at 1 per cent of sales and 2 per cent of exports of an entity. The increase in outflow of these payments started after the government liberalised the FDI policy in 2009. It had removed the cap and permitted Indian companies to pay royalty to their technical collaborators without seeking prior government approval.

Royalty is paid to a foreign collaborator for transfer of technology, usage of brand or trademarks. In April last year, a surge in royalty outflow prompted the government to set up an inter-ministerial group to analyse payment norms and see whether there is excessive payout by Indian companies to foreign collaborators. Proposing these restrictions, the ministry had argued that the curbs would help increase the profits of domestic companies, mainly in the automobile sector, prevent depletion of foreign exchange reserves, protect interest of minority shareholders and increase revenue for the government.

Before 2009, royalty payments were regulated by the government and capped at 8 per cent of exports and 5 per cent domestic sales in the case of technology transfer collaborations. They were fixed at 2 per cent of exports and 1 per cent of domestic sales for use of trademark or brand name. Telecom companies too pay \$15 royalty for every mobile line. A single line ideally supports a single call at a given point of time. Similarly, Auto major Maruti Suzuki pays an average royalty of around 5.5 per cent of its net sales to its parent Suzuki.

<https://www.business-standard.com>

Upcoming cloud computing policy

A panel working on the Indian government's cloud computing policy wants data generated in India to be stored within the country, according to its draft report seen by *Reuters*, a proposal that could deal a blow to global technology giants such as Amazon and Microsoft who offer such services. It could not only raise their costs because they will need to ramp up the number and size of data storage centers in India, where power costs remain high, but at least some of those increases are likely to be passed onto customers who include everyone from small start-ups to large Indian corporations.

The policy will be the latest in a series of proposals that seek to spur data localization in India, as the government finalizes an overarching data protection law. Local data storage requirements for digital payments and e-commerce sectors are also being planned. The authorities want the information stored

locally so that they can more easily get access to it when conducting investigations.

India's push for localization comes at a time of heightened global scrutiny of how companies store user data. In July, India said its federal police had begun probing Cambridge Analytica's misuse of Facebook user data, which New Delhi suspects included information on Indian users. The draft report of the cloud policy panel, which is headed by the co-founder of Indian tech giant Infosys, Kris Gopalakrishnan, said a "forward looking" data protection regime was needed as India's IT laws framework was "not sufficient" for cloud computing.

The Indian public cloud services market is set to more than double to \$7 billion by 2022, the draft report said. Enterprise spending on data center infrastructure software will rise 10 percent to \$3.6 billion in 2018, research firm Gartner estimates.

<https://www.firstpost.com>

R&D spending in automobile sector

Automobile companies' spending on research and development (R&D) grew 6.28 per cent in 2017-18. While this is better than the -0.34 per cent seen in FY17, it is still a far cry from the double-digit growth in the three previous years. This moderation is despite record sales, and changing regulations which require more research and development spends. New advanced emission, fuel efficiency and safety rules are to take effect over the next three to four years which will require companies to develop the technology to meet these norms. Automobile sales in India are up 14 per cent to 2,49,72,788 in 2017-18, the highest in six years. The analysis is based on figures gleaned from the financials of Tata Motors, Mahindra and Mahindra, SML Isuzu, Ashok Leyland, Hero Motocorp, Bajaj Auto, Maruti Suzuki India, TVS Motor Company and Eicher Motors.

Tata Motors (excluding its UK subsidiary, Jaguar Land Rover Automotive) leads in this spending. The maker of the Tiago and Hexa models spent almost Rs 24 bn in FY18, up 14 per cent over a year and its highest in at least five years. This was part of the company's effort to turn around in passen-

ger vehicles and strengthen its position in the commercial vehicle segment. Mahindra and Mahindra, the second largest in this order, has been spending in excess of Rs 10 bn a year. However, its R&D expense dropped to Rs 19.9 bn in FY18, from Rs 20.8 bn a year before. The maker of the Scorpio and XUV 500 has a busy product pipeline ahead, as it seeks to protect its share in its core SUV segment and shore up investment in electric vehicle technology. An e-mail sent to Mahindra remained unanswered till the time of this report.

Hero MotoCorp also saw its R&D expense fall, to Rs 4.9 bn in FY18 from a little over Rs 7 bn in FY17, lower than any of the previous three years. A company spokesperson said this was because of an unusually high level of investment in FY16 and FY17 in setting up a Centre of Innovation and Technology (CIT) in Jaipur. "With the CIT now fully operational, our R&D spend in FY18 (came down)," he said. Hero now boasts of a state-of-the-art R&D facility and a global team of engineers that is working on developing a new range of products for customers around the globe, he added.

<https://www.business-standard.com>

JAPAN

Patent arbitration hub

Japan will open an international arbitration body specializing in intellectual property here in September, the first one in Asia designed to facilitate resolution of a growing number of patent disputes. The spread of the "internet of things" has led to more clashes between companies over patents. With patents for essential communications technology now being used by a wider range of industries, the number of cases that cannot be settled through dialogue is rising, according to Japan's Patent Office. The organization will feature a roster of a dozen or so arbitrators from inside and outside Japan, including a former chief judge of a U.S. court that hears patent cases. It will be led by Katsuya Tamai, a University of Tokyo professor specializing in intellectual property law.

Dealing with allegations of patent infringement requires a deep understanding of the value and scope of the intellectual property

in question. Such cases can be time-consuming for a court or an arbitration organization set up to handle business disputes more generally. The new center will seek to resolve cases within a year. Though patents are registered separately in different countries, decisions made by arbitrators are binding across the 150-plus signatories to a United Nations agreement on arbitral awards, making it easier for companies to recover damages overseas. Japan's new institution will be able to hear even disagreements between non-Japanese companies, if all parties agree.

Japan's government has backed the creation of a specialized center to take on international arbitration hubs such as Singapore and Hong Kong. The organization likely will not only help protect Japanese intellectual property, but also bolster trust in the country's systems among foreign companies, furthering Tokyo's ambitions of making Japan a global heavyweight in intellectual property.

<https://asia.nikkei.com>

REPUBLIC OF KOREA

R&D spending in innovative industries

The Republic of Korea will jack up investment in research and development (R&D) for innovative industries to help local companies lead the fast-changing technology trends and create quality jobs, the government said. The Ministry of Trade, Industry and Energy said it will expand support for five promising new industries – autonomous vehicles, home appliances using Internet-of-Things technology, bio health, semiconductors and displays, and renewable energy – by increasing the percentage of R&D investment spent on these industries from the current 30 percent to 50 percent by 2022.

The ministry set aside 3.16 trillion won (US\$2.96 billion) for this year's R&D projects. The government said it will put concerted efforts with related industries to develop emerging technologies and make use of them in various areas. The Republic of Korea plans to put self-driving cars on its highways by 2020 and increase the number of electric vehicles to 350,000 by 2022. It also seeks to expand investment in establishing decentralized energy infrastructure to raise

the ratio of renewable energy resources, such as solar, wind and steam power plants.

<http://english.yonhapnews.co.kr>

SINGAPORE

Digital innovation

In line with Singapore's efforts to encourage innovation and digital transformation, Singtel has opened its FutureNow Innovation Centre (FIC). The centre has been designed to advance the Singapore government's industry transformation maps (ITMs) that focus on six key industry clusters, namely manufacturing, built environment, trade and connectivity, essential domestic services, modern services, lifestyle.

The centre will showcase some of the latest technology trends such as cloud, software-defined networks, data analytics, artificial intelligence (AI), cyber security, Internet of Things (IoT), robotics and 5G telecommunications technology. Set up to foster innovation and digital transformation around Singapore's \$4.5 billion ITM initiative, 23 industries are set to benefit under this initiative. Specifically, this is through providing services and solutions to spur innovation and assist enterprises to transform business models, unlock additional growth opportunities, redefine customer experiences and improve productivity.

The FIC will also showcase smart home technologies, including voice-controlled home systems and IoT for the consumer, which can be all managed through a single platform. Furthermore, the centre will also serve as a centre for collaboration between technology partners from small and medium enterprises as well as global technology leaders with Singtel and its customers, leveraging on the 650 million consumers across Australia, India, Indonesia, the Philippines, Singapore and Thailand.

To boost the research capability of the centre, it will also link up with Singtel's R&D labs with the National University of Singapore, Nanyang Technological University, Advanced Remanufacturing and Training Centre as well as Agency for Science, Technology and Research. In an effort to enhance skills and advance research in key areas, Singtel has made recent strategic investments with

various corporate R&D labs and institutes of higher learning and the national research foundation to develop deep technology capabilities and intellectual property in cyber security, AI, advanced data analytics, smart computing applications, building automation systems, robotics and industrial IoT.

<https://sg.channelasia.tech>

Industry digital plan

Small and medium-sized logistics businesses will find opportunities to take part in projects that could benefit the entire industry through a newly revealed Industry Digital Plan (IDP), the Infocomm Media Development Authority (IMDA) said. The online plan will guide logistics SMEs towards participating in projects and national initiatives that aim to "uplift the whole sector". These include in-mall distribution, federated lockers and the National Trade Platform, the IMDA said.

Logistics SMEs will receive step-by-step advice on the digital solutions required at each stage of their business growth in the digital economy. A new self-assessment checklist will also be made available on SME Portal to help SMEs identify their digital readiness and the digitalisation opportunities based on their needs. The IMDA will also continue to put up digital solutions it has pre-approved – such as in customer management or data analytics – on Tech Depot, a one-stop platform for tech solutions on the SME Portal website.

Among the first projects that will be highlighted under the IDP is a tripartite partnership between the IMDA and VCargo Cloud, together with Bolloré Logistics (Singapore), Dimerco Express Singapore and LCH Lockton, to make use of digital technology to improve efficiency. The TechSkills Accelerator (TeSA) programme – a SkillsFuture initiative launched in April 2016 to train information communications technologies professionals – will support the IDP. The IMDA, with support from the Singapore Economic Development Board and Spring Singapore, launched the Logistics IDP as part of the SMEs Go Digital Programme, and in support of the Logistics Industry Transformation Map.

<https://www.businesstimes.com.sg>

VIET NAM

Registration of technology transfer now mandatory

According to the new Law on Technology Transfer dated 19 June 2017 and Decree No. 76/2018/ND-CP which was issued on 15 May 2018, registration of technology transfer has been made mandatory from July 1, 2018, in Vietnam. Earlier, registration was only mandatory for technology transfers which were restricted. Except for restricted technology transfers which require specific permits, following are the types of technology transfer that needs to be registered with the state management agencies of science and technology.

- Technology transfer from a foreign county to Vietnam;
- Technology transfer from Vietnam to a foreign country; and
- A domestic transfer which uses State capital/budget, excluding ones that have already received the Certificate of Registration of Science and Technology Task Outcomes.

Technology is defined as a solution, process, or know-how that may or may not be supported by instruments and facilities to convert resources into products. Technology transfer is the transfer of the right to own or use (part or whole) of a technology from a party which has the right to transfer.

If the transferred technology involves intellectual property rights protection, the transfer will be carried out according to the Law on Intellectual Property. Involved parties need to register for intellectual property rights and technology transfer separately.

The Vietnamese party is solely responsible for the registration process.

- Transfer from a foreign country to Vietnam – the transferee;
- Transfer from Vietnam to a foreign country – transferor; and
- Domestic transfer using State capital/budget – transferee.

- In case of a domestic technology transfer, the provincial Department of Science and Technology is the registration authority. In case it's between a Vietnamese firm and a foreign country entity, the authority is the Department of Technology Appraisal, Examination, and Assessment under the Ministry of Science and Technology.

To examine the technology transfer agreement, the government has set the fee equivalent to 0.1 percent of the total value of the agreement. However, it should not be less than VND 5 million (US\$ 214) and not more than VND 10 million (US\$428).

Involved parties need to submit their registration application within 90 days of the agreement signing date. In addition to the registration agreement, other supporting documents required are:

- Original or certified copy of the technology transfer contract;
- Notarized or authenticated translated copies of the technology transfer agreement in Vietnamese;
- Investment Registration Certificate copies of both parties;
- Documents confirming the legal status of the representatives of the parties to the contract; and
- Power of Attorney, in case a third party has been authorized to carry out the procedures.

Contracts signed before July 1, 2018, but renewed after July 1, must follow the new regulations. Once the application has been filed, the competent authority has five working days in which it must either issue the registration certificate or provide reasons for refusal. In case an agreement is incomplete, the government authority needs to inform the applicant within three working days. If an agreement is being amended/supplemented, the competent authority needs to inform the transferor within five working days.

The new regulations will enable the government authorities to keep track of technology transfers into Vietnam and assist tax authorities during audits and inspections

in evaluating deductible expenses as the contracts will be registered.

<http://www.vietnam-briefing.com>

Innovation network programme

The Programme of Connecting Vietnam Innovation Network 2018, which gathered hundreds of talented Vietnamese in the fields of science and technology, was launched in Hanoi on August 19. The event was jointly held by the Ministry of Planning and Investment, the Ministry of Science and Technology, the Ministry of Foreign Affairs, and the Ministry of Education and Training. It saw the attendance of by Prime Minister Nguyen Xuan Phuc.

Minister of Planning and Investment Nguyen Chi Dung said that in an earlier meeting with overseas Vietnamese talents in science and technology the same day, Prime Minister Phuc lauded their return, especially in the era of industry 4.0 which poses both opportunities and challenges to the nation.

Currently, the ministry is working with relevant ministries and sectors to build a national strategy on industry 4.0, which comprises the establishment of innovation centres, and mobilisation of experts and scientists, he said, adding that the innovation network initiative has lured the participation of more than 100 overseas Vietnamese scientists so far.

The programme will gather overseas Vietnamese and domestic scientists who will meet to exchange and share visions as well as strategies for scientific and technological development in the sectors that Vietnam needs to accelerate in the coming time, Minister Dung said.

Meanwhile, Minister of Science and Technology Chu Ngoc Anh laid stress on human resource issue, seeing it as a competitive factor to promote the country's growth quality. The launching ceremony was followed by a dialogue on connection of science and technology community, and policies on innovation network connection in Vietnam.

<http://en.nhandan.org.vn>