

WORLD FOCUS



A robot at a parking facility. As labour costs increase, there is enormous demand for the use of robots in China. PHOTO: VCG

CHINA'S ROBOT REVOLUTION

It is making strides in the field of robotics and accompanying technologies such as AI – but still years behind the West

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in Chongqing

A small crowd has gathered around Ms Feng Zhulin's stall at the Smart China Expo in Chongqing, craning their necks to catch a glimpse of the spherical object she is holding aloft. It is a robot called Zhiban. Questions about the volleyball-size machine come quickly. Zhiban – which means knowledgeable buddy – can sing, have simple conversations with children in English and read them text messages from their parents, among other things, responds Ms Feng.

"Many parents are too busy to attend to their kids these days, so they see this as an investment," said Ms Feng of the 800 yuan (\$1160) robot. "There will be more and more robots like this next time, this is the future," she told The Straits Times.

Service robots such as Zhiban are a burgeoning industry in China, driven by a large and ageing population demanding robots that can do everything from cleaning homes to keeping the elderly company.

The market in China for such robots amounted to 12.2 billion yuan last year, roughly a tenth of the overall market which was valued at 120 billion yuan last year.

There are three broad categories of robots – service robots, special robots and industrial robots. Special robots refer to those that perform niche functions such as disaster rescue or bomb disposal.

A report released last month by Chinese tech company Hit Robot Group (HRG) and the China Institute of Science and Technology Evaluation estimates that the market for service robots alone will more than double by 2020, reaching 26.9 billion yuan.

"The Chinese service robot market is in an exploration stage and companies are deepening their understanding of applications for various scenarios," said the report.

There is a mind-boggling variety of robots available. Last month's expo in Chongqing was opened by a throng of dancing robots and the conference venue was patrolled by autonomous robots that the public could approach for directions.

Mr Zhen Ao, sales manager for robot maker Roobo, which makes a range of educational robots, said such robots were slowly becoming more mainstream.

"Last year, we would sell maybe 20 robots at one exhibition like this, but now at similar events, we sell 70 to 80 in a day," he said, adding that most of his customers were young parents.

'JEWEL IN THE CROWN'

Chinese President Xi Jinping called for a "robot revolution" in 2014 and Beijing has since invested heavily in robotics and accompanying technologies like automation and artificial intelligence (AI).

These come under the "Made in China 2025" industrial strategy, that aims to make the country home to tech giants Alibaba and Tencent – a world leader in these key technologies.

Mr Xin Guobin, China's vice-minister of industry, calls the robotics industry a "jewel in the crown for the manufacturing industry" and a new frontier for the country's industrial revolution.

The Chinese government has also rolled out a plan to develop the industry, attract foreign investment and push robotics applications to a wider range of fields, including defence.

Domestic firms such as Siasun and DJI have grown rapidly, while others have acquired foreign robotics makers. China's Midea group paid US\$5 billion (\$6.8 billion) for German firm Kuka in 2016.

Ordinary Chinese are also taking a growing interest in robotics. At the recent expo in Chongqing, the largest crowds were often found at robot exhibits.

Construction engineer Xu Dechan, 34, summed up the Chinese sentiment: "If these robots can help my children in the future, then why not?"

Experts say factors such as favourable policies and a sizeable talent pool have led to the rapid expansion of the robotics industry, which according to official data has been growing at a rate of 30 per cent annually for the past five years.

In 2016, China captured 31 per cent of the global market for industrial robots. Its goal is to have Chinese-made robots make up more than half of the global market share by 2020.

That means 100,000 industrial robots and counting. Commenting on China's industrial upgrading process, Assistant Professor Weng Yue-Hsuan of Tohoku University's Frontier Research Institute for Interdisciplinary Sciences said: "If this is successful, China can become one of the global leading robotics countries in innovation."

DEMOGRAPHIC PRESSURES Time, however, is not on China's side. Beijing is in a big hurry to develop its robotics capabilities because it is facing a ticking demographic time bomb, said Professor Xiong Yu, a scholar from Northumbria University.

Faced with an ageing population and a slowing birthrate, the world's second-largest economy has to



How three key players compare

UNITED STATES

The country that gave the world such movies as The Terminator and I, Robot is also a leading purveyor of advanced robotics technologies.

Many of the world's leading roboticists work in American universities and are at the forefront of robotics technology. Researchers from the Massachusetts Institute of Technology, for instance, have built a robot cheetah that can run and jump over hurdles.

Many chips used by China for autonomous driving are made in the US.

The US had a robot density of 189 in 2016, according to the International Federation of Robotics (IFR). Robot sales in the US will grow by at least 15 per cent annually till 2020, it estimated in a report this year.

SOUTH KOREA

South Korea has the world's highest robot density of any country – 631 – exceeding the global average by eight times. The country has held the top position since 2010. Singapore comes in second with a robot density of 488.

The IFR said South Korea's top ranking is due to high volume of robots used in the electronics and automotive industries. The country also uses robotic teachers, workers and service staff. South Korea will plough US\$450 million (\$613 million) into its robotics sector, building R&D centres and funding research.

JAPAN

Dubbed the Land of Rising Robots, Japan is the world's largest industrial robot manufacturer, producing 52 per cent of the global supply, or 153,000 robot units in 2016, said the IFR.

The government has been active in promoting the development of the robotics industry, providing US\$45 million in subsidies since 2015.

The country uses robots widely from the medical field, where they assist doctors in surgery, to more specialised applications, such as the use of robots to monitor radiation levels after the Fukushima nuclear disaster.

Danson Cheong

Robots may soon be ubiquitous in China, with the country's push to increase their production and use. PHOTO: VCG

BOOM TIME

12.2b yuan

Value of the market for service robots in China last year, roughly one tenth of the overall market which was valued at 120 billion yuan.

26.9b yuan

Expected value of the market for service robots in China by 2020.

iPal (right) is a social robot that is designed to offer care and companionship to children and the elderly. PHOTO: REUTERS



come to terms with a shrinking demographic dividend.

Many labour-intensive enterprises now face a shortage of workers; labour costs have doubled within the last decade.

"As labour costs increase, there is enormous demand for the use of robots, particularly in manufacturing," said Prof Xiong.

A recent report, Human Capital Investment in The AI Era: Future Challenges And Coping Strategies In The Chinese Job Market, jointly released by the China Development Research Foundation and Sequoia

China, found that robots are al-

ready replacing human labour in provinces including Jiangsu, Zhejiang and Guangdong.

The country purchased 141,000 industrial robots last year, up 58 per cent from the year before, reported the state-run China Daily in July.

Mr Luo Jun, chief executive of the International Robotics and Intelligent Equipment Industry Alliance, told The Straits Times: "Many industries in China are still very labour-intensive. As the pace of industrialisation intensifies, the pace of automation will also increase."

China has a robot density of 88,

Robots at the City Social Welfare Centre in Hangzhou. China is in a big hurry to develop its robotics capabilities because of an ageing population and a slowing birth rate. PHOTO: EPA-EFE

meaning it has that number of robots for every 10,000 manufacturing workers – this metric is a yardstick for a country's level of automation.

In contrast, Singapore, ranked second in the world, has a robot density of 488. South Korea is first, with 631, according to figures from the International Federation of Robotics.

TAKING OVER THE WORLD? Experts say China's robots are still a long way from world domination.

"The robotics industry as a whole is still taking its first steps... if you look at the United States, its manu-

facturing and industry are all at the highest level; for China to outpace it in 10 years, that's not possible," Mr Luo said.

Prof Weng also pointed out that while robotics makers in the US and Japan usually develop their products based on market demand, Chinese product development is usually tied to the availability of policy subsidies.

"We cannot say this is bad, this top-down approach can sometimes effectively guide newcomers entering the market," he said.

But he added that this could also lead to subsidy fraud, where prod-

uct makers churn out low-quality products to get government subsidies, citing as an example electric vehicle makers that used cheaper and lower quality batteries than otherwise stated in order to obtain subsidies from the government.

"The more fundamental issue should be how we can promote quality engineering and create a healthy culture of ensuring the quality of the devices we make," he said.

The HRG report also flagged that Chinese robot makers still depended on core components from abroad.

With the Sino-US trade war show-

ing no signs of abating, it could put a spanner in the works for the Chinese robotics industry as the export of some key technologies to China has been prohibited.

Prof Xiong said this illustrates the need for China to boost cooperation with other countries even though its own large 1.3 billion population is a ready market to test, develop and sell new robotics products.

"China must keep an open attitude and protect the intellectual property of others, so they would be willing to work with us," he said.

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KIDS COMPANION

Many parents are too busy to attend to their kids these days, so they see this as an investment. There will be more and more robots like this, this is the future.

MS FENG ZHULIN, who was running a stall selling service robot Zhiban at the Smart China Expo in Chongqing, said she has simple conversations with children in English and read them text messages from their parents.