

CHINA FOCUS

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The Future of Industrial Automation

The days of cheap labour and mass production are long over in China. But as labour costs continue to rise, technology leaps forward, and a rapidly growing number of Chinese businesses are connected to the internet, there will also be advances in how companies manufacture their goods and more importantly, how consumers interact with them.

In this issue of China Focus, we interview two industry leaders on how advances

in industrial automation have affected their China business. We address the hot topic "Industry 4.0", which originated in Germany and quickly became part of the global conversation. Lastly, we take a look at 3D printing and what consequences it could have for your business in China.



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The Factory of Tomorrow

Mark Poensgen is in charge of International Group Development at igus, a leading worldwide manufacturer of bearings, linear guides, cable carriers and flex cables.

How has igus adapted to Industry 4.0?

MP: Industry 4.0 requires safe and reliable data flow and performance, which we can promise through our thorough testing process. igus e-chainsystems are designed for the purpose of data transmission. Our chainflex cables have been tested millions of times in our test laboratory, with the results available online, ready to be used for online configuration tools. Worldwide, our customers' very challenging applications confirm that the data transmission by igus e-chain systems is safe.

Is China ready for Industry 4.0?

MP: In China, automation is more necessary than in any other market, especially if the country wants to maintain or even improve its current position in the global market. For the first time, the country is faced with the challenge of moving from a heavily manual way of manufacturing to one that is automated and "plugged in". Time and again, China proved that change is possible and I don't see it being any different when it comes to automation. Of course, Germany is still ahead when it comes to Industry 4.0 but it is only a matter of time until China catches up. In fact, in the long run there is bigger potential in China due to the size of the market and its will to be competitive.

How is your set-up in the Shanghai Free Trade Zone beneficial to you and your customers?

MP: With our entire Asian setup, our goal is to be closer to our customers, offering technical support for their increasingly localised engineering, production and services. By combining our centralised warehouse with customised assembly in China and our network of local warehouses all over Asia, we are able to offer our customers a clear delivery promise for over 100,000 catalogue items. If you consider that the processing time for our most popular product lines is 24 hours from order to delivery, it makes sense that we need a simple customs process. The improvements of the Shanghai Free Trade Zone support our strategy to reach our customers in Asia much faster with a wider product range.

You were the first German company to be granted the APOP status in the Zone. How does this help you?

MP: igus is one of only 20 companies out of the more than 1,000 selected for the

Asian Pacific Operation Program (APOP), which is coordinated by the Waigaoqiao Zone Administration. The aim of this program is to support members in setting up their Asian Operations Headquarters in Shanghai. For igus, the Asian market is strongly developing so it was only a matter of time until we centralised more operational functions in Shanghai. These include product management, marketing, and HR, especially training. Local product management allows us to roll out new products faster in Asia, while global product development is stimulated by these divisions.

How do you safe-guard your critical know-how from being copied in China?

MP: We cannot safe-guard our knowledge and in many ways we do not want to, so we openly offer it to the Chinese market, as any other. Of course, we try to defend our properties and innovations with patents and trademarks, but in the end our best protection is our knowledge, experience, and understanding of our customers' needs. Our aim is to be



igus systems and cables are customised to the requirements of Chinese customers

“The Chinese government will not allow the country to fall behind and once this next step is achieved, we can expect to see true manufacturing excellence”

- Frank Geng, Kemppti

ahead of the curve by placing our competitive edge in the speed of development. Hence, our products are developed and tested in our 1,750 m² test centre with the latest technical advantages and a reasonable price tag.

What trends in automation have you witnessed in China?

MP: In previous years, global players were used to selling based on their market position, i.e. they had little competition and could leverage their name to demand higher prices for their products. These days however, many customers have been downsizing their costs, while focusing more on finding individualised solutions that fit their needs. Especially for China, which is fast developing with many new companies popping up competing with our customers, this is a very relevant trend. Global market leaders have to adjust and face the challenge of being competitive.

At igus, we invest more in developing innovative products that fit the requirements of our customers. The properties of our products are clearly defined and well tested, so that we can always deliver the newest technologies to our customers.

for a variety of applications. As a result, the complexity of Japanese products is lower because they remove unnecessary functions, while only minimal supporting hardware and software is needed. In contrast, European manufacturers have fewer models and achieve different functions with various configurations. Thus, European manufacturers have a more open interface and also a higher price.

How will the increasing salary levels affect the advancement of industrial automation?

FG: Contrary to popular perception of robots and automation, labor cost is not the only factor for factories to adopt automation. In fact, production with robots and automation equipment can lead to a more complex process set-up, albeit at a larger investment. The major benefits of adopting automation are quality and stability improvement. As they say, “to err is human”, and sometimes there can be consistency issues, as workers tend to make mistakes in the production process. Investing in this new technology will eliminate these risks.

For China, it is only a matter of time until automation technology is adopted on a larger scale. The Chinese government will not allow the country to fall behind and once this next step is achieved, we can expect to see true manufacturing excellence, as was the case in Japan in the 80s.

What trends can we expect to see in the next decade?

FG: While we have seen an increasing number of companies in China investing in automation over the last few years, there are still many misconceptions and unrealistic expectations that need to be dispelled. Many people think robots are omnipotent and cannot see the corresponding limitations, such as the high demand of supporting facilities and the more complicated processes. Currently the majority of Chinese companies are still followers of international companies and local leaders. Once the Chinese automation market has settled into its appropriate demand, Chinese automation and robot solution providers will continue to grow together with the Chinese customers.

The Chinese government will continue to provide very attractive incentives for local companies to boost automation. For example, in Zhejiang province, the local government provides subsidies of up to 30% of the procurement price to local companies purchasing automation and robot solutions. Additionally, there are 30-40 automation/robot industrial parks established along the coastal areas of China. ☼

How Fiducia can help



Are you expanding your activities in China?
Let us help you with:

- ▶ Competitor analysis
- ▶ Market advisory and research
- ▶ Devising an optimal business set-up
- ▶ Recruiting of key staff with relevant technical know-how
- ▶ Logistics coordination

Email us at contact@fiducia-china.com for more information.



Frank Geng is the General Manager of Kemppti in China, a world-leading manufacturer of arc welding equipment and a provider of solutions for highly productive welding.

How big is the knowledge gap between Western and Chinese companies?

FG: Let me take the industrial robot market as an example: there are only 4-6 local so-called big robot manufacturers in China. However, even these top players are considered to be 10-15 years behind, compared to Western and Japanese companies. In recent years, the Chinese government has attached great importance to the robot and automation industry by issuing strong supporting policies to build up the Chinese market. We expect the Chinese market will experience a trial period of 3-5 years and will catch up with advanced countries within a decade.

What are the differences between European and Japanese manufacturers?

FG: Japanese manufacturers dominate with a market share of over 50%. They are characterised with more specific products

Dawn of a New Era: Industry 4.0

With the many rapid technological advances we have witnessed in the last decade, the global conversation has turned towards Industry 4.0, setting the ambitious goal of changing the way companies manufacture their products. Industry 4.0 aims to dramatically increase efficiency, while offering a flexible and cost-efficient alternative to the status-quo – truly the dawn of a new era. But what does it mean for China, a historically labour-intensive market with limited access to industrial automation? In this article we address why China is the next big market for Industry 4.0 and what it means for you.

Smart Factories

The term Industry 4.0 was first coined in 2011 at the famous Hannover Fair in Germany by a working group of top industry leaders discussing the future of industrial automation. The idea behind it is that we are now entering the 4th Industrial Revolution, after the age of steam, electric power, and information technology, into the advent of the “smart factory”. At its core is the concept of “The Internet of Things”, i.e. that eventually everything will be connected over the internet in a giant network. Through this, we can create cyber physical systems, allowing machines, devices, materials and more to communicate with each other to create a more efficient production process.

Within the next 20 years, Industry 4.0 will completely revolutionise how we view manufacturing. We will be able to make highly individualised products that can communicate their unique specifications while being produced. Because of this, tomorrow’s manufacturing will be extremely flexible, resource friendly, and cost-efficient. Companies will be able to adapt to rapidly changing market conditions while globally connecting all production sites into one comprehensive network.

Since the concept of Industry 4.0 was first developed in Germany, it is no surprise that German companies are at the forefront of advancements in this integrated new system. International powerhouse Siemens has already developed new software and steering solutions to customise standard products, such as artificial knee and hip joints within 3 to 4 hours from several days. Trumpf, a leading German machine tool manufacturer, has worked on what they call a “social machine”: each component is “smart” and knows what work has already been carried out on it,

while customers can receive pictures of the machine in real-time and provide feedback directly.

What does this mean for China?

Historically, China has been a readily available source of cheap labour. However, in recent years a steady rise in wages and a movement towards skilled workers has led the country to overtake Japan as the world’s biggest market for industrial robots. In fact, one of the major components of the government’s current 5-year plan is to develop the domestic intelligent manufacturing market. Currently, there are only 23 robotic units for every 10,000 workers in China, while the global average lies at 58. This is bound to change, as the government has committed to building 30 industrial parks devoted to robotics in an effort to grow the domestic market to reach RMB 3 trillion by 2020.

“There are only 23 robotic units for every 10,000 workers in China, while the global average lies at 58.”

While coping with internal pressures of rising labour costs, an aging population and worsening environmental strains, China is also making efforts to not fall behind the “re-industrialising” developed countries by investing in smart technology. In addition, mounting competition from ASEAN countries providing cheap labour has encouraged China to put concrete measures and targets into place to stay ahead of the game. These include implementing “Big Data”, “Industrial Clouds”, and e-commerce to traditional industries and encouraging the development of producer service industries. A main focus will be to develop intelligent equipment with core values of digitalisation, flexibility and integration in key industries.

What it means for you

As China adapts and advances in the Industry 4.0 space, foreign companies will have to prepare for increased competition from domestic players. The Chinese government’s aim is to build up major local champions. Safeguarding your know-how may become more of a challenge, as digitalisation of all processes also makes companies vulnerable to cyber-attacks. Additionally, with this shift, the so-called “War on Talent” will be even more pronounced, as employees with fitting technical know-how will become scarcer and more sought after. ☹

Chinese Pioneers



There have been a number of Chinese pioneers contributing to the advancements of Industry 4.0. E-commerce giant Alibaba has worked on data customisation that can be used in so-called “smart homes”. Truking, a medical equipment manufacturer, developed process parameters for auto capturing, storing and processing, real-time monitoring and remote accessing. The company has been able to systematically integrate equipment, technology, processes and management to increase energy efficiency.

When the concept of additive manufacturing, better known as 3D printing, made its first appearance in the 1980s, the technology available at the time was too costly and basic to make it a commercially viable method of production. In recent years, however, the technology has made a come-back with a big bang, offering an entirely new way of how we manufacture products. Especially for China, a country known for mass-production and cheap labour, the proliferation of 3D printing could have substantial consequences. In response, China's Ministry of Industry and Information Technology has formed the "China 3D Printing Technology Industry Alliance" to fund 10 research centers at an investment of RMB 200 million.

How it works

The basis of 3D printing is a digital design file that can be created either from scratch by using a relevant CAD software or by scanning an item with a special scanner that will create the file for you. The 3D printer reads this file and then in turn "prints" the item by adding tens of thousands of microscopic layers of material. It is possible to print in plastic, ceramics, metals, wax, glass and more, with a process that softens these materials so they can be utilised for printing.

Why the hype?

3D printing could affect a wide range of industries, as new possibilities of manufacturing become reality. In the medical field, for example, companies have experimented with printing prosthetics and even human tissue, opening up a world of new opportunities. Clothing companies have created custom-made shoes and garments, products made to fit exactly the person who will wear them. Even printing with food is not unheard of, in the form of specialised chocolates with individualised designs and puréed food in a retirement home in Germany.

The bottom line here is that, similar to Industry 4.0, 3D printing will allow us to manufacture highly individualised products. Sizes, colours, materials, and more can be made to the specifications of the individual consumer. Indeed, it is likely that people will be able to

print their own products in their living rooms, buying digital design files from companies directly online.

Manufacturing of Tomorrow

3D printing could change the way we manufacture in several ways:

- ▶ Rapid prototyping: no longer will you have to wait weeks to receive samples as they can be printed and adjusted immediately by simply altering the design file.
- ▶ Faster manufacturing: there will be no need for mass amount manufacturing anymore, as products can be printed in smaller quantities.
- ▶ Shorter supply chain: with 3D printing production can be localised, making some middle men obsolete.
- ▶ Individualised production: products can be tailor-made to the consumers' specifications.
- ▶ Less manual labour: the focus will be to find talent with the know-how to use this technology.

What it means for China

China and India are pegged to be promising emerging markets for 3D printing. Together, they are expected to achieve a 37% CAGR from 2014 to 2020 in the 3D printing market. In 2013, around 22,000 3D printers were manufactured in China, a number set to grow quadruple in the next 4 years. While global competition still largely dominates the field, China is catching up, exporting over 50% of printers made locally to foreign markets.

3D printing has already been adopted in some industries in China, such as the automotive sector, which actively uses the technology for prototyping. However, one of the bigger challenges 3D printing faces in the country is that high-quality materials are still not readily available, especially compared to more advanced markets such as Germany. This, coupled with a lack of IP laws covering this technology, shows that there is still much room for improvement but also opportunity in additive manufacturing in China. ☘

Source: Fiducia Analysis, Lux Research

One step ahead



In 2011 Foxconn announced the goal of having 1 million "Foxbot" robots installed in China to replace human employees. The company still employs over a million workers and hired an additional 100,000 staff for the production of the iPhone 6. A new generation of Foxbots was announced this year to speed up development by partnering with Google.

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