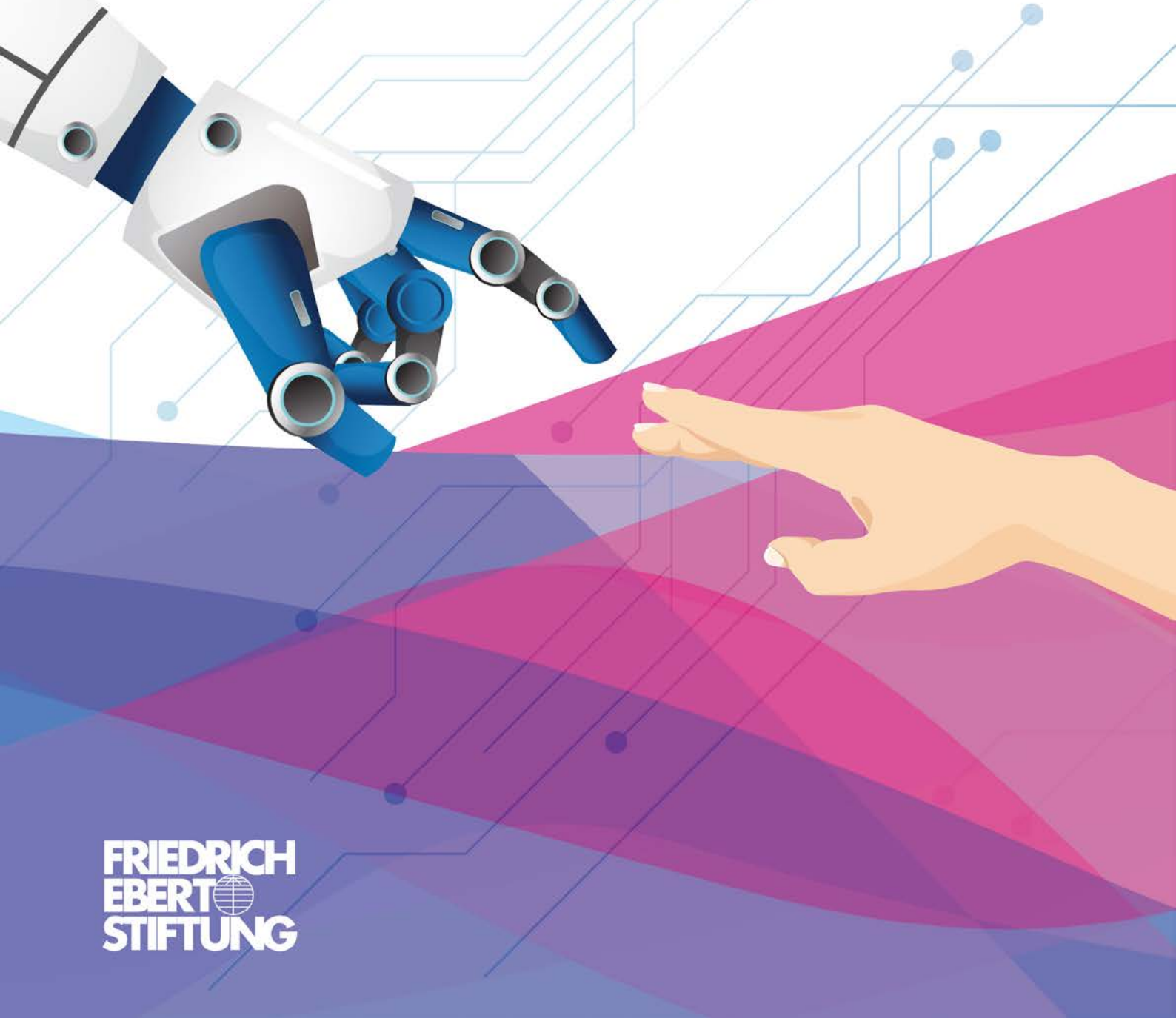
# GERMAN ROBOTS IN CHINA AND THE ALIBABA VILLAGES

**Discussion paper based on a conference on "Intelligent Manufacturing and Work 4.0 – Challenges and perspectives in China, South East Asia and Germany"**

Sergio Grassi, Stefan Pantekoek, Yannick Ringot



FRIEDRICH EBERT STIFTUNG

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## Introduction

The ongoing global technology-driven industrial and platform-based revolution has been variously labelled as Industry 4.0, Intelligent Manufacturing, digitalization, automation and robotization as well as e-commercialization of the economy, or simply the fourth industrial revolution. While China is waging a massive national effort in this field, promoted under the complementary strategies "Made in China 2025" and "Internet+", South East Asian nations have initiated broad debates about the digitalization of the economy as well. The German concept of "Industrie 4.0" has become a common reference point for these efforts even if they differ in substantial ways from one another. [1]

Besides the impact of the staggering technological advances of the past two decades, the economic model of export-led growth – seen by many developing countries as the quickest way to attract FDI and boost their economies – might be severely weakened in times of automation, reshoring, looming trade wars and increasing protectionism around the world. Furthermore, the comparative advantages of many developing countries such as cheap labour are shrinking due to ageing populations, rising wages and companies shifting towards more automated and efficient modes of production. For a specific country the impact of the current technological revolution will depend among others on its position within global value chains; the presence of adequate infrastructure; industrial policies/ relations; labour market policies; education, qualification and training policies; population ageing; regional as well as international coordination and cooperation.

What can already be observed however is the emergence of a new form of capitalism, in some countries increasingly independent of human labour and unconstrained by geography relying instead to a greater degree on a few highly-trained employees. Also quite clear is that there will be a severe impact on global value chains in certain sectors and on the competitiveness of countries and entire industries with consequences for labour markets, job profiles, the needed skills and qualification, social security, labour laws and regulations. Few would dispute that technology has, throughout history, altered the nature of work. But today, the pace of technological change and innovation is unprecedented. The future of work has started now! An in-depth analysis of the implications of the digital economy on labour markets and sectors of employment is a necessary precondition to develop appropriate strategies.

This discussion paper is based on the topics debated during the conference: *Intelligent Manufacturing and Work 4.0 – Challenges and Perspectives in China, South-East Asia and Germany*, which took place from June 12–15 2018. The conference was organised by the Shanghai Representative Office of Friedrich-Ebert-Stiftung (FES) and Sun Yat-sen University (SYSU) and was hosted by the Robotation Academy in Foshan, a city in the Pearl River Delta in Southern China with a high concentration of manufacturing industry that strives to become the top place for intelligent manufacturing and robot production in the world.

## China's digital transformation: Made in China 2025 and Internet+

China has for a long time been the "workbench of the world", starting in the late 1980s. After the global financial and economic crisis in 2008 had exposed China's heavy dependence on foreign markets, the Chinese government realized the need to transform the country's mainly export-driven, labour-intensive economic model into a high-value-added, high-technology-based economy with a strong industrial basis. Since 2015, robotization, Artificial Intelligence (AI) and "Industry Internet" have become hot topics there, a trend that this bound to intensify as the central government and virtually all province-level

[1] In contrast to the technological and strategic roadmap that is Made in China 2025, Industrie 4.0 in Germany has evolved from an industry-backed slogan/ initiative into a dialog platform where the relevant stakeholders such as representatives from different sectors, employers' associations, trade unions, academia, and politics come together to discuss, research and shape the changes brought about by the digitalized economy.

governments have been pushing hard for innovation-driven development.

At the core of this transformation are two complementary strategies: Made in China 2025 and Internet+. Regarding the former, Chinese leaders took some cues from the German "Industry 4.0" concept, and outlined a 30-year economic and industrial transformation plan, announcing the start of the first phase in a comprehensive document in 2015. This strategic plan calls for transforming China into a "major manufacturing power" by 2025, reaching an "intermediate level among world manufacturing powers" by 2035 and becoming "the leader among the world's manufacturing powers" by 2049, the centennial of the founding of the People's Republic of China. This goal applies in particular to ten high-tech industries such as the automotive industry and aims to achieve technological catch-up and in the long run also import substitution (localisation). But so far, Made in China 2025 seems to be a clear top-down strategy that stands in contrast to the German multi-stakeholder concept of the Industry 4.0 Platform.

The Internet+ initiative is the other aspect of China's transformation which was announced at the same time as Made in China 2025 but is often overshadowed by the latter. It aims at making full use of the Internet's economic potential, particularly in the service sector and e-commerce. Among the many examples are the nation-wide roll-out of smartphone-app based payment systems by the Chinese tech industry's main players Alibaba and Tencent, the rapid proliferation of ride-hailing and bike-sharing schemes in many cities and other services of the sharing- and gig-economy.

The combination of these approaches could turn China into one of the main beneficiaries of Digital Capitalism, if the country is able to handle the technological upgrade of its industrial sector while also leveraging the significant power of its tech companies (which have already obtained a considerable competitive edge in the global digital marketplace and particularly in the research and development of AI applications).


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## Intelligent Manufacturing in China

An overarching catch-phrase denoting the technology-driven changes and the transformation of production factors in China is "Intelligent Manufacturing". While these changes have led to improved product quality, they have also led to the degradation of the bargaining position of low and middle-skilled workers and therefore contribute to the deskilling of the labour force, according to some observers in China. Besides the focus on improved product quality, the reduction of labour costs (which had markedly increased since 2010) is another powerful driver for increased use of automatization and robotization. For instance, Zhejiang Province (one of the entrepreneurial centres of China) recently announced to "save" two million workers within the next two years. Ambitious to become China's leading region in factory automation, the government of the manufacturing powerhouse that is Guangdong Province has bluntly promoted Made in China 2025 with the slogan "Robot-Replaces-Man".

Should such announcements become true, it might lead to a severe polarization of employment (i.e. an increase of jobs for high-skilled and low-skilled workers, to the detriment of the middle segment). Other likely consequences are a decrease in the power/influence of workers' collective representation as well as rising structural unemployment. If unchecked by the Chinese government, this development is sure to have a negative impact on the continued growth of China's middle class, already burdened with high costs for education and housing among others.

## The KUKA-case

Emblematic for the trends and efforts described above is the recent acquisition of KUKA, a German manufacturer of industrial robots. Established 120 years ago in Southern Germany, Kuka currently has 13.500 employees and has three main business pillars: systems and production lines, industry solutions and logistics as well as the world-leading production of industrial robots which are for example widely used in the German or US automotive industry.


*Photo © Sergio Grassi*

In summer 2016 the news that the Chinese company Midea (hitherto mostly known for manufacturing household appliances) had acquired 95% of KUKA shares for 4.6 billion euros attracted a lot of attention in Germany and beyond. Many in the German political and business community voiced their concerns that a company with such strategic value would be sold to a Chinese company. This sparked a process in which the bigger EU member states such as Germany, France and Italy pushed the European Commission to draft measures allowing for the screening and even blocking of future acquisitions. In the case of KUKA however, the firm's management was able to allay most of the immediate concerns after getting Midea's top management to sign a detailed investor agreement. It was negotiated in close coordination with KUKA employee and trade union representatives and will secure KUKA's independence until at least 2024. Furthermore it is stipulated in the investor's agreement that both parties strive for the expansion of KUKA's business and market position in robotics, automation, logistics and support to leverage future market opportunities; both parties will strive to increase the R&D staff at existing R&D locations as well as to aim at expanding the business in China. Both firms are now in a joint venture in China and are building two factories which will already start production by the end of 2018. According to Midea representatives the plan is to produce 100.000 KUKA robots in China until 2020, which will be used for accelerated robotization in Chinese companies.

Although KUKA in Germany has fully automated production lines, using heavy-duty robots like the KUKA Titan (which is able to assemble copies of itself), the number of workers at KUKA production sites in Germany has in the last years significantly increased. While job profiles are changing and adequate qualification and vocational training is needed, for the time being no mass-layoffs are expected. On the whole, the biggest concern at the company is not the replacement of human workers by robots, but rather the increasing shortage of skilled workers. This has been a problem for the wider German economy for some time and the German government as well as labour and employer representatives have been working on this issue. In China, this is also starting to become an issue as a result of the rapid technological upgrading on all fronts and the slowness and inadequacies of the education and vocational training systems (see below).

*Photo © Sergio Grassi*

## E-commerce & the Taobao Village

E-commerce has become increasingly important in the whole Asian region and particular in China, where it is making an increasingly important contribution to the service sector, which itself has grown to 56% of total GDP. Besides the very large e-commerce players, there are now also a multitude of active small-scale sellers who are using a new business model that emerged in recent years, propelled by the digitalisation of the economy: the "Taobao Village". Taobao is an e-commerce platform that is a subsidiary to the biggest Chinese e-commerce player Alibaba, a tech-company that is worth almost 500 billion USD. While Alibaba does mainly larger-volume Business to Business (B2B) transactions, Taobao – which

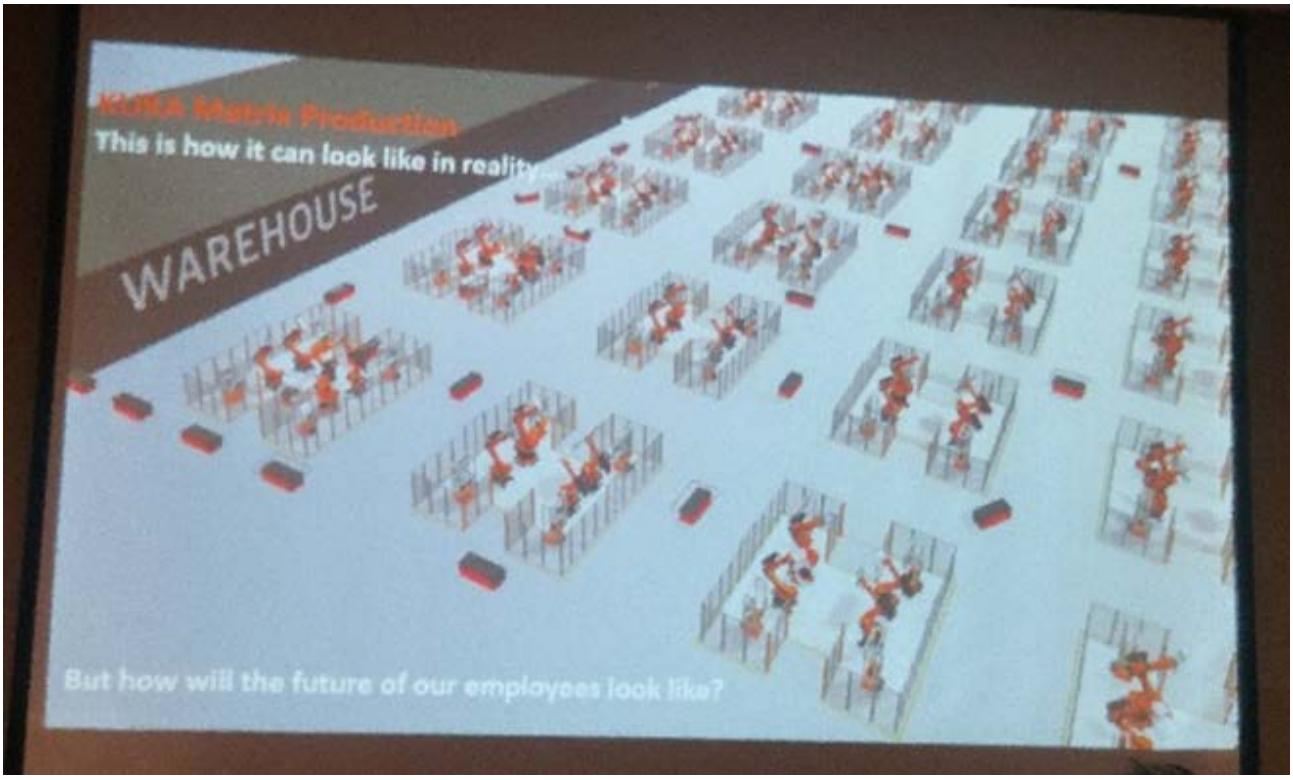


*Photo © Sergio Grassi*

can be compared to a hybrid of Amazon and Ebay – is rather geared towards small-volume Business to Consumer (B2C) transactions. In 2018, Taobao had over 580 million monthly active users, making it an enormous quasi-monopolistic platform (which also happens to collects enormous amounts of data about its users and their shopping preferences and interests, fuelling the algorithms of its parent company's other services and AI research departments).

A Taobao Village by Chinese definition is a village with at least 50 household operating their own shops on Taobao. These clusters of rural online entrepreneurs who had opened shops on the platform and who are mainly specialized in the textile sector began to emerge in China in 2009. Since then, the number of Taobao Villages has been on the rise across the country, and those villages have become a significant force behind the development of "rural e-commerce" in China. These shops are generally very small, mostly family-based, operate in highly informalized ways and are mainly based in rural areas in the Pearl River Delta and the Yangtze River Deltas in Southeast and East China.

While Taobao Villages obviously contribute to the economic development of rural and remote areas in China, they deserve further critical analysis. Especially since it already became clear that there is a contradiction between the low-cost production of goods sold in Taobao shops and local governance. First, Taobao shops almost pay no taxes and second, they may not apply basic labour and safety standards. While some observers in China highlight that the Taobao shop workers might now earn more than in factories, others warn against the emergence of "rural sweatshops 4.0".

## Attempting to assess the impacts of the technological transformation

After two conference days of discussing the technology-fuelled transformation in Asian countries, Germany and beyond, there was consensus among the experts from

industry, trade unions and academia that the national conditions of each country (such as the education system and the age structure of the population among others) are important determinants of whether or not it can actually make use of the new technological possibilities.

Another sentiment that emerged is that the new round of fear over the Made in China 2025 strategy and that China's increased technological prowess might challenge countries like Germany as a competitor for high-tech equipment seems – at least so far – to be exaggerated. While Made in China 2025 is certainly ambitious in scope, so far it is mainly an import-programme for German and other European high-tech products. But given the growing appetite of Chinese companies for strategic acquisitions of European and US high-tech companies and the risks of uncontrolled transfer of know-how, the situation is likely to change in the next decade and should be observed closely. In any case acquisitions like this will certainly continue to raise (geo-) strategic concerns in Germany and other countries. This makes intensified European coordination necessary as the time-based technological lead against China will gradually shrink. The pooling of European venture capital would be a logical next step.

The exchange in Foshan between experts from China and other countries in Asia and Europe also interestingly revealed that robotization has not brought much change in the global supply chain yet, while e-commerce platforms on the other hand have already caused significant changes in regional supply chains.

Another conclusion was that it is still uncertain whether the success of e-commerce platforms like Taobao was a net positive for workers. While those individual workers able to sell their wares on Taobao might now have a comparatively higher income, the emergence of these sales channels might also lead to more informalization and fragmentation of the workforce in China, especially if the central and local governments are unable or unwilling to uphold basic labour and safety standards.

However, if the Taobao Village can be turned into a government-guided business model, it might also be an interesting development programme for rural and remote areas in countries like Indonesia, where the government puts a lot of emphasis on reducing the development gap between cities and villages and strives to create employment. These "Villages 4.0" might be one solution to bring together outstanding and unique local products with urban purchasing power as an economic and employment stimulus package for countries with a distinct agrarian character. The economic potential of e-commerce for countries in South-East Asia in general is widely acknowledged, while the risk of e-commerce monopolies is also starting to become visible.

Nowhere else in the world is the pace of this industrial and digital transformation faster than in the Pearl River Delta. This area in Southern China therefore remains an extremely interesting laboratory to analyse the positive and negative aspects of this great economic and social transformation. Because of the enormous regional disparities in China's development, the central and local governments have to develop adequate strategies for each of these development zones. Therefore the country could serve as a laboratory and should be closely


*Photo © Sergio Grassi*

observed. But also, the whole of China is a unique economic dialogue partner for Germany, South East Asia and other countries in Asia.

The PRC will soon be the biggest economy on the globe; it is already the biggest market for the sale of German cars and mechanical engineering products and Chinese decision makers clearly want to link Made in China 2025 with Germany's Industrie 4.0 concept. Furthermore, China is already the biggest trading partner for several economies in South East Asia and Jack Ma – the founder of Alibaba – has been appointed as special government adviser by many Asian countries like Indonesia and Malaysia. This suggests that – barring an all-out trade war – the economic soft power of China and its interlinkage with Asia but also with the wider world economy is only going to increase in the years to come.

On the global level, there was consensus among the participating experts that the trends making up the so-called fourth industrial revolution had a huge potential to boost the economy and markets of many countries, differences in development notwithstanding. In general, while some existing jobs are likely to completely disappear, many others will be transformed or enhanced, and wholly new types of jobs will be created as well. The industrial transformation and the digitalization of the economy offer opportunities and pose challenges for economic progress, for employment, for decent work and social equality. Both, opportunities and challenges for the economy and for employment need to be recognized and incorporated in policy approaches.

Against this background experts at the Foshan conference also concluded that policymakers, enterprises, trade unions and NGOs from China, South East Asia and Germany should intensify the exchange on ideas to cope with accelerating technological change, and how to adapt national and regional economies while protecting workers' rights and safeguarding or restoring solidarity in the times of the fourth industrial revolution.

In recent years, quite a few worst-case scenarios have been published predicting mass-unemployment through digitalisation and automatization. While many of the drastic projections of job-loss figures do not stand up to detailed scrutiny, it is undeniable that the employment structure in many countries is starting to become more polarised and that workers' bargaining power could be seriously eroded. However, there are indications that the overall volume of work will most likely not change significantly in many sectors in the coming decades in industrialized countries like Germany. One example for this is the above-mentioned case of KUKA/Midea that might even become a carefully observed model for win-win cooperation between a Chinese/Asian and a German/European company that creates more employment in Germany and in China, establishes a measure of trust between potential competitors and where the principle of co-determination and the involvement of all stakeholders ensured a friendly and successful takeover.

## Upskilling of the workforce & qualified work as the core issue in all countries

What will change though, are the types of work, job profiles and workers' qualifications. Ensuring that this capital- and technology-driven transition of the nature of work itself does not leave workers' and societies' interests behind is one of the most important tasks of our time. It is therefore essential to develop concepts and concrete measures to not only identify but also to manage and actively shape the ongoing change. This especially applies to upskilling and retraining current workers and to educating and training future ones. In China however, these issues had hitherto not been given a high enough priority, Chinese experts warned and added that the Made in China 2025 initiative did not adequately involve workers and their representatives. Besides the general problems of the vocational schooling system in China (such as at times inadequate curricula and the reticence of companies to invest in inter-sectoral training programmes), another problem was that personnel turnover was often very high in Chinese firms, all but negating firms' efforts to retain skilled workers. Other issues were the lower pay and social standing of blue-collar workers compared to their white-collar counterparts as well as the "academisation" of many sectors of the economy (resulting in white-collar workers being preferentially hired instead of blue-collar workers). Recent recalibrations of the Made in China 2025 initiative's goals in 2018 hint at a growing awareness among the Chinese government of the need

and associated problems with upskilling the labour force and adapting China's education system.

One of the core issues in China, Germany and South East Asia to reap the benefits of the technological transformation while minimising its downsides, therefore seems to be how to guarantee an efficient, fair and affordable system for qualified work.

Consequently, more exchanges are needed in areas such as vocational training, human-resource management, and on how to deal with labour skill mismatch, how to improve wage and incentive systems, appraisal of skills, and workplace safety and privacy. Therefore, a broad dialogue between the main stakeholders would be highly desirable, involving political decision-makers, workers' and employer representatives, civil society and academia.

The Conference Intelligent Manufacturing and Work 4.0 – Challenges and Perspectives in China, South East Asia and Germany, jointly organized by the Foshan Robotation Academy, Sun Yat-sen University and the Shanghai Representative Office of Friedrich-Ebert-Stiftung made a small contribution to this important exchange which will hopefully be continued and intensified as a transcontinental and strategic format in the near future.

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