

APS 1028 - Final Report

Title: The Transformation of Chinese Industry Based on Industry 4.0



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Executive Summary

This paper discussed the history and content of Industry 4.0, and find potentials of Chinese industry under Industry 4.0 background. Multiple case studies including the success of Siemens Electronic Works Chengdu (SEWC) and Baosteel Group Corporation are provided to evaluate Industry 4.0 strategies and how they can be applied to help Chinese companies to win competitions.

Firstly, the paper discussed challenges that Chinese manufacturing enterprises are facing: the 5 big innovations in big data, autonomous robot, the technique of simulation, the internet of things and additive manufacturing made Industry 4.0 transformation a necessary process to Chinese enterprises. But the lack of information technology and increasing labor costs made this strategy even harder to be applied to Chinese manufacturing industry. Market globalization, economic regionalization and information networking make demand increasingly personalized. The goal of low cost and high efficiency has pushed the industry into mass production mode. The successful cooperation between Baosteel Group Corporation and Siemens AG showed that Industry 4.0 strategy could actually helped with transformation of large-scaled state-owned manufacturing enterprise to reduce production cost, increase work efficiency, and provide transformation experience to other manufacturing enterprises.

Secondly, the paper discussed corresponding recommendations. The current manufacturing industry should pay more attention to large-scale, personalized and customized manufacturing methods. Take Siemens - Electronics Works Amberg (EWA) for example, their fully automated approach and ability to process large amounts of data have made the plant a leader in industry 4.0. Through the specific bar code of each product, the connection between the product and the production equipment, and the responsibility of human resources, the factory can achieve the goal of the customized and large-scale production line. On an assembly line, different components can be automatically assembled through preset control procedures to produce products with different characteristics.

Moreover, because of the communication between products and machines, the entire production process is optimized for IT control, and the production efficiency is greatly improved: less than a quarter of the workload needs to be handled manually, mainly for data detection and recording. The establishment of SEWC by EWA in China was also a great

success. SEWC innovates the management mode according to local conditions, encourages employees to make Suggestions, and promotes exchanges with German technicians.

To countermeasure the down trending of Chinese manufacturing from social perspective, the government should decrease value added tax, adjust income tax, and set up policies to encourage enterprises utilize their profit into research and innovations, move to upper stream value chain to make more profit to attract skillful worker back to manufacturing industry from services sectors. Meanwhile, the government should encourage young generations to take vocational education to encounter aging issue and shortage of skilled labor.

In the end the paper provides actions that both Chinese government and enterprises should take to accomplish the transformation under Industry 4.0 background. The team pointed out that even though Chinese industry may not be able to transform directly to 4.0 era, it still would be able to take benefit of Industry 4.0 step by step. Large-scaled state-owned enterprises and cooperated with advanced western enterprises, focusing on large-scale, personalized and customized production mode and gradually transit to medium and small companies which focusing on automation and facility management. The government should encourage the transformation through construction of smart factories, bring medium and small private companies into contact with large state-owned companies, training talents through transformation of the education system to vocational education, as well as tax policy adjustment. In this way, Chinese industry would step forward and take up the leading position in global competition.