Siemens R&D in China

As one of the world’s most innovative companies, Siemens aims to be a trendsetter in technology development, focusing on delivering tangible benefits to customers and stakeholders for their sustainable growth.

With diverse market needs and customers willing to try new things, China provides an ideal environment for world-class innovations. For decades, Siemens has been increasing R&D investments in China. Meanwhile China has become one of the most important R&D bases for the company. By Fiscal Year 2015 (October 1, 2014 – September 30, 2015), Siemens has about 4,500 R&D researchers and engineers, 20 R&D hubs and more than 10,000 active patents and patent applications in China.

Siemens is making constant efforts to locally design and develop the right products and solutions for the Chinese market to meet local customers’ needs, integrate into local innovation system, and also use China’s advantages to develop technologies in the country for global application. Siemens has raised several innovative concepts and models that apply to China’s innovation environment, such as S.M.A.R.T. Innovation (Simple, Maintenance-friendly, Affordable, Reliable, and Timely-to-market), need-driven disruptive innovation and so on, all of which have great influence on innovation and industry fields. In 2013, Siemens established innovation centers in Wuhan and Wuxi. They are dedicated to driving local innovation industry with need-driven innovation projects, as well as achieving joint development with local government and partners through cooperation with small and middle-sized businesses in pilot projects.

In 2016, Siemens will also establish new innovation center in China. Cooperating across Division boundaries, more than 300 R&D staff will develop new technologies, products and solutions with a strong focus on digitalization.
Siemens Technology-to-Business China in Shanghai has long been working with external sources to systematically bring their innovations into commercial use. Siemens China Corporate Technology has also set up an intellectual property department to bundle strategic functions related to intellectual property in China, including patents, trademarks, technology transfer and licensing issue. Moreover, Siemens Corporate Technology Development and Digital Platforms China (Shanghai/Nanjing) can provide efficient product development and services for Siemens’ business departments.

Siemens also signed a memorandum on education cooperation with the Ministry of Education of China, and established good relationships with over 200 Chinese universities and vocational schools. Siemens has helped universities and institutions establish labs, and the company also set up Siemens scholarships to further promote the cooperation on scientific and technical exchanges, as well as talent cultivation. Siemens has been sponsoring the “Siemens Cup” National Undergraduates Industry Automation Contest for nine years to support development of innovative engineering talents. Moreover, in 2015, Siemens and Guangdong Province signed an agreement to jointly promote vocational education. The two parties will cooperate in fields like organizing vocational skills competition, faculty cultivation, establishing comprehensive training bases and providing advice and support for discipline development.

**Digitalization for market value creation**

The world is becoming ever more connected. Billions of intelligent devices and machines generate massive data, bridging the virtual world and the real world. Turning this mass of data into values is one of the key factors of Siemens’ success. The company has mastered key know-how of many industries and is able to apply professional hardware and software technologies to develop innovative solutions. Across all domains, Siemens, one of the world’s largest software companies, integrates data, software and hardware to help Chinese customers strengthen core competitiveness.
With its innovative Digital Enterprise Software Suite, including Product Lifecycle Management (PLM) software, Manufacturing Execution System (MES) and Totally Integrated Automation (TIA) system with Teamcenter, an integrated collaboration platform, as data backbone, Siemens helps Chinese enterprises move forward to reach “Industrie 4.0”. In process industries, Siemens helps Chinese enterprises achieve digitalization by providing comprehensive solutions from integrated engineering to integrated operation, including Comos – a software solution for plant engineering, design and management, Simatic PCS 7 process control system and Simit process simulator, Comos Walkinside 3D virtual reality platform, and XHQ operations intelligence and optimization software, etc.

Siemens also provides advanced intelligent traffic information and management systems to help reduce traffic jams and accidents, and could cut CO₂ emissions by 20%. To accommodate the increasing demand of power, Siemens’ digital grid technologies can balance supply and demand, and also enable the large-scale integration of renewables at 40% less cost. Siemens intelligent building technologies can help cut energy consumption of buildings by as much as 40%. In the healthcare sector, the network imaging intelligent processing platform syngo.via, developed by Siemens, can significantly make image reading process faster and save 77% of time for reading cardiac Computed Tomography (CT) images, compared with other reading solutions.

In December 2015, Siemens launched the digital service platform Sinalytics, combining a variety of established and new technologies in the areas of remote maintenance, data analytics and cyber security. The platform makes it possible to aggregate, securely transfer and analyze vast amounts of data to provide remote maintenance and optimization services for customers’ equipment. Today, ranging from gas turbines, wind turbines and industrial facilities to trains, buildings and medical imaging systems, some 300,000 devices worldwide are already linked to Sinalytics.

**Embrace the future of manufacturing**

Leading technologies from Siemens have laid firm foundations for “Industrie 4.0”, making production and management in manufacturing more efficient, more flexible
and faster. The digital manufacturing solutions developed by Siemens center around Digital Enterprise, Totally Integrated Automation, Integrated Drive Systems, process automation, energy efficiency, services and so on, covering industry software, hardware and data-driven services.

Siemens Electronics Works Chengdu (SEWC) is one of the most advanced electronics plants in the world and also the first “digital enterprise” of Siemens outside of Germany. As part of Siemens global industry automation manufacturing and research system, SEWC has realized a high degree of digitalization of the process from product design to manufacturing, and shortened the time to market by up to 50%. The state-of-the-art design of SEWC also makes the factory highly flexible to enable mixed production of different products and allow reasonable planning for future production capacity adjustment.

To better serve the automation and drives markets in China, Siemens has developed and launched a number of S.M.A.R.T. products, including SIMATIC IPC 3000 SMART, S7-200 SMART, SINUMERIK 808D ADVANCED CNC and SINAMICS V90 Servo Drive System and so on. Two of the SINAMICS Perfect Harmony GH180 products: GH180 10kV (40-140A) and GH180 10kV (315-550A) hit the market in 2014. For the local customers, the company also launched SITRANS P310 and intelligent valve positioner VP160. Beide Motor, specially designed by Siemens for China market, covers low-voltage and high-voltage motors.

**Build intelligent infrastructure**

Siemens makes infrastructure more intelligent through automation and digitalization technologies to cope with challenges brought by fast urbanization process, economic change, climate change and demographic change in China.

Beijing Siemens Cerberus Electronics Ltd. (BSCE) is one of Siemens’ key global Centers of Competence of Building Technologies for fire safety and HVAC (heating, ventilation, and air conditioning) products. Equipped with world-class labs and test machines, BSCE is committed to providing comprehensive building products and systems. The company researches, develops and manufactures more than 1,200
products for customers in more than 60 countries and areas in Asia, America and Europe.

Siemens’ investment in mobility R&D helps boost rapid development of China’s railways and guarantee operation safety. By September 2015, the innovation hub of Siemens Signalling Co. Ltd., Xi’an (SSCX) has held 28 utility model patents and four invention patents awarded by China’s State Intellectual Property Office. Moreover, S700 K-C electric point machine, S 21 Balise system and Az S 350 U axle counting system, all introduced and adaptively designed by SSCX, have been widely used on China’s speed-up lines, passenger-dedicated lines, high-speed lines and metro lines. Besides, JM2 end position detector and SRT6 contact group, both independently developed by SSCX, are now widely used on passenger-dedicated lines and high-speed lines. Catering to the market demand for improving performance of point operation system in China, SSCX introduced CKA-C external locking device from Switzerland and finished the adaptative design. So far, the product has passed the technical solution audit of the National Railway Administration.

As a trusted partner for the development and promotion of efficient and reliable power infrastructure, Siemens provides power utilities, industries, infrastructure and buildings in China with the portfolio they need. The portfolio includes facilities and systems for the level of low- and medium-voltage and power distribution network, smart grid and energy automation solutions, power supply systems for industrial plants and so on. As a result, Siemens has established R&D teams in Shanghai, Wuxi, Hangzhou and other cities to focus on designing and developing products including high-voltage gas-insulated switchgear, high-voltage circuit breaker, high-voltage disconnector, circuit protection, medium-voltage gas insulated switchgear, medium-voltage air insulated switchgear, vacuum circuit breaker, vacuum contactor and so on. The R&D teams follow global design and quality control methods to serve all aspects of intelligent infrastructure.

The R&D department of Siemens Power Automation Ltd. (SPA) has developed high-quality power protection and energy automation products. While SPA provides localized products and solutions to Chinese customers, it also works on international R&D projects of energy automation. The department has also joined hands with local
Siemens Transformer Co. Ltd. Jinan (STCL) is the only Siemens factory with a Design Hub affiliated to Siemens Transformer Global Technology Center outside of Europe. In August 2015, the 500MVA/500kV single phase auto transformer, designed and produced by STCL for Hongyang Power Distribution Project of SGCC Shanghai Electric Power Corporation, successfully passed test all at once. It is also the single phase auto transformer of 500kV with the world’s largest capacity.

**Develop sustainable energy**
Siemens is the world’s leading provider of energy technology and solutions. As a trusted partner of China’s energy industry, Siemens creates values for customers along the value chain of electrification.

To adapt to the rapid development of China’s power industry and reach a higher goal of green power, Siemens is committed to promoting the concept of modern digital power plant. The company provides comprehensive products and services for the safe, economical and optimized operation of power plants. Siemens Power Plant Automation Ltd. (SPPA) can offer power plant automation control systems with the most advanced software and hardware. It provides various automation control strategies and optimization control software for supercritical and ultra-supercritical units, environmental protecting units (air cooling, desulphurization and deNox cycle units) and combined cycle units to achieve multivariable and variable-parameter operation, and meet the requirement of integration of management and control for
modern power plants. The SPPA-T3000 for Shanghai Waigaoqiao Power Generation Co. Ltd. Phase III (2X1000MW) is a good example. Moreover, SPPA has developed a series of power plant optimization management software and has helped establish the first digital power plant in China.

Siemens Steam Turbine Engineering Hub is among the first batch of Siemens global R&D hubs set up in Shanghai. The Hub aims to establish R&D capability for steam turbines in China and focuses on engineering activities for the next-generation steam turbine product development of large coal-fired power plants. Moreover, Siemens has also established an R&D hub in Siemens Industrial Turbomachinery (Huludao) Co., Ltd. to provide design and manufacturing of turbo compressors and steam turbines for petrochemical, power generation and waste water treatment industries in China.

Siemens Gas Turbine Engineering China Hub makes contributions to value-added of Chinese and global gas turbine product chains in the areas of new gas turbine frame R&D, existing frame modification and upgrade, customer order engineering, field service support, supply chain management and manufacturing support, etc. In 2013, Siemens started cooperation with Shanghai Jiao Tong University to set up a gas turbine joint research center to conduct researches in fields including overall performance design of gas turbine, advanced processing technology, high temperature alloy and coating, gas turbine vibration and so on, and jointly promote the development of high-end equipment manufacturing industry in China.

**Deliver high-quality healthcare**

For years, with its innovative technologies, Siemens provides comprehensive and customer-oriented medical solutions to enable more people to enjoy high-quality healthcare services.

As part of Siemens global computed tomography (CT) R&D team, Siemens Shanghai Medical Equipment Ltd. (SSME) is the company’s only CT R&D and manufacturing hub outside of Germany. In 2014, SSME launched the independently-developed SOMATOM Scope, a new generation of 16-slice CT. Meanwhile, SSME CT software R&D team has tied up with Healthcare R&D hubs in Germany for the development of software for advanced CT system. SSME is also the largest R&D and manufacturing
base for Siemens X-Ray systems outside of Germany. In 2014, the first independently developed mammography of SSME, Mammomat Select, was launched to greatly benefit women health.

Siemens X-Ray Vacuum Technology Ltd., Wuxi (SXVT) is the only Siemens R&D and manufacturing base for X-ray tubes and X-ray tube assemblies outside of Germany. So far, SXVT has completed the development of X-ray tubes RAY-6, SDR, RAY-1 with rotating anode as well as X-ray tubes SR120, SR125 and SR90S with stationary anode. Furthermore, SXVT has also accomplished the transfer and localization of CT tubes DURA202/302/352 with ball bearing, CT tubes DURA422/688 with liquid bearing as well as X-ray tubes OPTITOP family with rotating anode for X-ray products.

As Siemens’ largest R&D and manufacturing base of MRI (Magnetic Resonance Imaging) outside of Germany, Siemens Shenzhen Magnetic Resonance Ltd. (SSMR) works closely with the headquarters in Erlangen, Germany, and Siemens Magnet Technology Ltd. in Oxford, U.K., to develop the best-in-class MRI products, which always set the trend in the global MRI business. In 2012, Siemens Healthcare set up R&D and manufacturing bases of Angiography Imaging (AX) and Component and Vacuum (CV) in Shenzhen. SSMR AX works closely with the headquarters in Forchheim, Germany, to fulfill the global demands for AX products. As a solution provider, SSMR CV provides highly competitive and cost-efficient products with outstanding quality for customers in the medical industry, including customized electronic systems, high-performance imaging solutions and remote connectivity solutions.

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