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Shanghai Pharmaceuticals: Seeking A Prescription For Digital Transformation

Professors Ming Dong and Ning Su wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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Decades ago, China’s innovations in health such as barefoot doctors and cooperative health care showed the world it was possible to improve the health and greatly increase the life expectancy for hundreds of millions of people. . . . Today, China can once again lead the way with cutting-edge primary health care reform that puts the patient first.

World Bank Group President Jim Yong Kim[[1]](#endnote-1)

The city of Shanghai was ever changing. The famous Bund, or Waitan, a waterfront area along the banks of the Yangtze River, had witnessed the city’s dramatic evolution from a hundreds-of-years-old trading port to a 20th-century metropolis to a contemporary megacity that served as a commercial and financial hub in the global economy. The city’s history mirrored the diverse architecture around the area of the Bund: traditional Chinese gardens and temples, grand merchant houses constructed to mimic Western buildings in the 1920s and 1930s, and ultra-modern skyscrapers that rose on both sides of the Yangtze River, backed by investments from all over the world. Blending old and new, the landscape of Shanghai in particular and China in general was both familiar and alien to many locals, not unlike the country’s business environment.

The pharmaceutical industry, one of the country’s most important sectors, had been undergoing significant, unprecedented transformation, creating challenges and opportunities for some of China’s oldest and largest companies. One of the players was Shanghai Pharmaceuticals Holding Co. Ltd. (Shanghai Pharma). Shanghai Pharma was one of China’s major national pharmaceutical companies. Publicly traded on the Shanghai and Hong Kong stock exchanges, the company had a comprehensive portfolio of businesses encompassing pharmaceutical research and development (R&D), manufacturing, distribution, and retailing. In 2015, Shanghai Pharma recorded revenue of ¥105.5 billion[[2]](#endnote-2) (over US$15 billion), placing it among China’s top 200 enterprises[[3]](#endnote-3) and providing the company with unique advantages in China’s healthcare market.

China’s overall healthcare industry had also been experiencing astonishing growth and becoming more important in Chinese society.[[4]](#endnote-4) The industry was experiencing dramatic changes. In 2009, the Chinese government initiated sweeping reforms with the goal of creating an effective, convenient, affordable, and universal healthcare system. The reforms accelerated changes across all segments of healthcare. The industry’s structure was shifting, competition was intensifying as local players and multinationals flocked to the market, and innovation was becoming a key driver for differentiation and value creation. Another major trend across China was the country’s digital transformation; information and communications technologies were profoundly shaping the Chinese economy and society, including the healthcare industry.[[5]](#endnote-5) In 2016, what should be the next steps for Shanghai Pharma as it faced such diverse opportunities and challenges?

China’s Healthcare SYSTEM

China’s healthcare system had evolved and progressed significantly since the country’s economic reforms began in the late 1970s. By 2015, the country’s public and private healthcare expenditures had reached US$640 billion, and this figure was expected to grow to US$1.1 trillion by 2020.[[6]](#endnote-6) Meanwhile, China’s healthcare expenditure accounted for only 5.4 per cent of the country’s gross domestic product in 2013,[[7]](#endnote-7) significantly lower than the average of 8.9 per cent for Organisation for Economic Co-operation and Development (OECD) countries and 16.4 per cent for the United States in particular.[[8]](#endnote-8) This represented significant opportunities. The growth of China’s healthcare industry was in part driven by macro-level demographic trends. China’s population was aging and becoming more urban. According to estimates, the Chinese population aged 65 and over would increase from 122 million in 2012 to 223 million in 2030. By 2020, 61 per cent of China’s total population was expected to be urbanized, compared to 52 per cent in 2012.[[9]](#endnote-9) These two trends were accompanied by rising income for the country’s citizens and improving infrastructure nationwide, driving China’s demand for healthcare products and services.

Policy was another factor driving the transformation of the healthcare system in China. In 2009, the Chinese government released a sweeping healthcare reform plan, with the goal of creating a universal health system that provided safe, effective, convenient, and affordable health services to China’s population of over 1.3 billion citizens. The plan laid out a blueprint for the country’s healthcare overhaul. According to the plan, between 2009 and 2011, the government would invest ¥850 billion (over US$120 billion) to meet a number of healthcare goals: (1) extend China’s basic medical insurance coverage to 90 per cent of the population, up from 65 per cent; (2) revise the national essential drugs list; (3) restructure the drug distribution mechanism; (4) allow China’s National Development and Reform Commission to further regulate pricing; (5) fund hospitals and other types of healthcare organizations; (6) narrow the urban–rural gap in terms of access to basic public health services, especially in areas such as disease prevention and control, women’s healthcare, and health education; (7) resolve conflicts of interest in public hospitals; (8) diversify the ownership structure of healthcare providers; and (9) encourage private capital to operate nonprofit hospitals.[[10]](#endnote-10)

Healthcare reform and the upgrading of related industries represented long-term, top priorities for China, and the government had shown a commitment to tackling issues in the healthcare system. In China’s governance system, policies from the national level drove policy making and implementation at provincial and local levels. In late 2011, the Chinese central government emphasized its goal “to establish a universal basic healthcare system providing safe, effective, convenient, and low-cost healthcare services by 2020.” In 2012, the government released its 12th Five-Year Plan, a set of comprehensive guidelines for the country’s social, economic, and environmental development over the next five years. The plan included policies bolstering the biotechnology, pharmaceutical, and healthcare industries. The combination of these three forces—the Chinese population’s demographic and economic shifts, policies for sweeping healthcare reforms, and the overarching five-year plan—drove the transformation of China’s healthcare system (see Exhibit 1).

Since the initiation of the reforms in 2009, China’s healthcare system had demonstrated significant progress, such as improvement of infrastructure in lower-tier cities and rural areas and an increase in insurance coverage, with over 95 per cent of the population enrolled in some form of insurance. Meanwhile, the scale and complexity of the reforms meant that there were still significant challenges to overcome.[[11]](#endnote-11) For example, primary care infrastructure still needed improvement; inefficiencies in the overall healthcare system still needed to be eliminated; public health insurance was still relatively basic; and private health insurance was still underused.[[12]](#endnote-12) A 2016 study jointly conducted by the World Bank Group, World Health Organization (WHO), and Chinese government agencies reported that, while China’s overall health level had reached the average of middle- and high-income countries, healthcare reforms needed to be deepened in order to build high-quality and value-based service delivery.[[13]](#endnote-13)

China’s Pharmaceutical Industry

China’s pharmaceutical market was the second largest in the world. The overall market had been growing rapidly since China started its economic “reform and opening” in the early 1980s. From 1980 to 1999, the number of pharmaceutical companies in China increased from 680 to 6,357; by the 1990s, China had created a relatively robust pharmaceutical sector.[[14]](#endnote-14) Now, this market was expected to grow 9.1 per cent annually, from US$108 billion in 2015 to US$167 billion by 2020. China’s pharmaceutical market represented a uniquely important component of the country’s healthcare industry. In particular, China’s spending on drugs represented 50 per cent of the country’s total healthcare expenditure, compared with only 13 per cent in the United States in 2009.[[15]](#endnote-15) The Chinese government was committed to securing the country’s drug supply[[16]](#endnote-16) and actively invested in infrastructure, innovation, and talent, contributing to a favourable macro-environment for this industry.[[17]](#endnote-17)

Meanwhile, China’s pharmaceutical market was still at a relatively early stage of development. Specifically, China’s per capita pharmaceutical spending was relatively low, at US$78. The market was dominated by lower-end generic drugs, which accounted for a hefty 64 per cent of the pharmaceutical market. Generic drugs were expected to be the mainstay of China’s pharmaceutical industry, and sales were expected to continue to grow significantly as the country needed to leverage the use of low-cost generics in the public insurance plan to control overall healthcare expenditures.[[18]](#endnote-18) Meanwhile, government policies aimed to increase consolidation and improve the industry’s efficiency by closing lower-quality manufacturers.

Higher-cost patented drugs, meanwhile, represented only 22 per cent of the Chinese pharmaceutical market. Patented drugs required a significant R&D investment, and when patents expired, patented drugs could be quickly replaced by generics. However, in recent years, with China’s improving intellectual property environment and increasing demand for high-quality, specialized drugs, sales of patented drugs had been growing at about 25 per cent per annum, and this growth was expected to continue. Besides generic and patented drugs, over-the-counter (OTC) medicines, sold through retail pharmacies, accounted for 16 per cent of total sales. China’s OTC market was growing rapidly, at about 17 per cent per annum, and it was expected to become the world’s largest by 2020.[[19]](#endnote-19) OTC sales were mostly led by respiratory remedies; vitamin, mineral, and nutritional supplements; and pain relievers. Traditional Chinese medicine was also a unique and important segment of the pharmaceutical industry. With its 3,000‑year history and extensive adoption, traditional Chinese medicine accounted for 40 per cent of the total pharmaceutical market in the 2000s and two-thirds of drug sales in terms of volume.[[20]](#endnote-20)

China’s pharmaceutical industry was highly fragmented. It consisted of over 5,000 domestic manufacturers, and the top 100 players made up just one-third of the market. Chinese drug companies traditionally focused on large-scale manufacturing of generics for domestic sales and active pharmaceutical ingredients (APIs) for export. China had become the world’s largest exporter of APIs. Meanwhile, Chinese pharmaceutical companies traditionally had limited investment in R&D and lacked innovation. Foreign multinationals had long viewed China as a key market. The world’s top pharmaceutical companies, such as Pfizer Inc., Merck & Co. Inc., AstraZeneca PLC, F. Hoffmann-La Roche Ltd. (Roche), and Novartis AG, had established joint ventures or wholly owned facilities in China to develop, produce, and market a variety of products. Capitalizing on strong capabilities and brand awareness among Chinese consumers, many of these companies were seeking to actively expand their business in China to take advantage of the country’s highly dynamic pharmaceutical market.

Distribution was an important segment of the pharmaceutical industry. Pharmaceutical distribution in China was highly complex. Hospitals represented the dominant channel for pharmaceutical drugs in the country and accounted for 70 per cent of drug sales. In distribution, a drug often had to flow through multiple distributors at multiple levels—national, provincial, city, and town—before reaching the hospitals for final sales to patients. This model significantly increased the distribution cost and limited the growth of the pharmaceutical market. Meanwhile, the distribution market was highly fragmented, consisting of over 13,000 distributors. China’s three largest pharmaceutical distribution companies—China National Pharmaceutical Group Corporation (Sinopharm), Shanghai Pharma, and China Resources Pharmaceutical Group Limited—accounted for about 20 per cent of the market; in comparison, the three top players in the U.S. market—McKesson Corporation, Cardinal Health Inc., and AmerisourceBergen Corporation—claimed over 95 per cent of the market.[[21]](#endnote-21) In addition, due to complexity, fragmentation, and a lack of integration among the information systems of different distributors, the entire supply chain had limited transparency and visibility, further exacerbating the inefficiency of the pharmaceutical market. For these reasons, China’s healthcare reforms sought to drive industry consolidation, improve operations, and increase information transparency in the market.

Shanghai Pharmaceuticals holding co. ltd. (Shanghai Pharma)

Shanghai Pharma was China’s second-largest pharmaceutical company. Due to the industry’s unique importance in the national economy, the company had a complex history that reflected the transformation of China from a planned to a market-oriented economy. In the 1990s, as part of China’s national economic reform, a number of companies belonging to the Shanghai municipal government’s Bureau of Pharmaceutical Administration formed a single state-owned enterprise, Shanghai Pharmaceuticals Holding Co. Ltd. In the early 2000s, a series of transactions diversified the company’s ownership and significantly increased its capital. In 2010, the company went through a major restructuring to focus on three main modules: R&D, drug manufacturing, and distribution. After the restructuring, the company was relisted on the Shanghai Stock Exchange and also became listed on The Stock Exchange of Hong Kong Limited, giving the company access to capital in global markets and providing the company with a platform for future growth.

In 2016, Shanghai Pharma employed 41,173 people, had reached a market cap of US$6.6 billion, and generated sales of US$16.75 billion.[[22]](#endnote-22) The company’s activities spanned the entire pharmaceutical value chain (see Exhibit 2). The company maintained and developed a comprehensive business portfolio that ranged from product R&D to sales. Shanghai Pharma operated in several segments: drug R&D and manufacturing, distribution and supply chain solutions, and retail and other operations. Specifically, the company focused its R&D on drugs for severe and chronic diseases. Adopting an open model for R&D, it established strategic alliances with a variety of partners, including Shanghai Institute of Materia Medica, China Pharmaceutical University, Shenyang Pharmaceutical University, Sichuan University, the Second Military Medical University, Shanghai Fudan-Zhangjiang Bio-Pharmaceutical Co. Ltd., and Mitsubishi Tanabe Pharma Corporation.[[23]](#endnote-23)

The company’s manufacturing business included chemical and biopharmaceutical products, Chinese medicines, healthcare products, and medical devices. It focused on five major categories of medicines: cardiovascular, systemic anti-infection, digestive system and immune-metabolism, neuropsychiatric, and antineoplastic. The company owned a number of drug brands widely known across China, such as SINE, Leishi, Dragon and Tiger, Cangsong, Guofeng, and Shengxiang, and was authorized to use the renowned trademarks of Qing Chun Bao and Huqingyutang. A number of the company’s APIs and preparations had passed the quality certifications of the WHO, the U.S. Food and Drug Administration, and the European Union, further diversifying the company’s manufacturing portfolio. The company emphasized adherence to international quality standards in manufacturing; it had adopted the lean management system and had met the requirements for the new Good Manufacturing Practice certification.[[24]](#endnote-24)

Drug distribution is a core competency of Shanghai Pharma. Approximately 70 per cent of the company’s total revenue is generated from distribution-related business. The company distributed for a variety of pharmaceutical companies, and its distribution network reached over 20,000 healthcare organizations across China. In the Chinese market, the company was the largest distributor for multinational pharmaceutical giants such as Roches and Merck; 60 per cent of the drugs imported into China were distributed by Shanghai Pharma. Of the drugs distributed by the company, 85 per cent were directly supplied to China’s major hospitals. In the absence of an effective primary healthcare system, these hospitals constituted the main source of healthcare for the Chinese population.[[25]](#endnote-25) Geographically, the company had traditionally focused on distribution to coastal areas in eastern, southern, and northern China, but it was actively expanding its distribution network to the entire country.

In addition to its distribution business, Shanghai Pharma also had direct access to end-consumers through its retail business. The company was among the top players in China’s rapidly-growing drug-retailing market.[[26]](#endnote-26) The company owned the Shanghai Huashi Pharmacy Co. Ltd. (Huashi), one of the largest chain drugstores in eastern China. Over the years, Huashi had established a strong brand in China and opened approximately 1,800 drugstores covering 16 provinces, autonomous regions, and municipalities across the country. These retail pharmacies complemented the company’s main business-to-business model, allowing it to directly reach individual consumers.

BIG Data and Information Technology

Shanghai Pharma’s long history of interacting with diverse upstream pharmaceutical manufacturers and downstream hospitals allowed the company to accumulate a large amount of data. The data encompassed activities of all stakeholders in the supply chain, from drug manufacturers to secondary distributors to hospitals and individual patients and customers. This rich dataset was stored in the company’s in-house data warehouse. Shanghai Pharma had three major partners in the area of information technology (IT): Deloitte Touche Tohmatsu Limited (Deliotte), IBM, and Capgemni SE. The company also had strategic partnerships with PwC and Chinese vendors such as Yonyou Network Co. Ltd., a provider of enterprise resource planning software, and Shanghai Baosight Software Co. Ltd., an IT solution provider.

The company invested significantly in IT. Its software development activities were mostly outsourced to the specialized IT partners, whereas the in-house IT team focused on project management. Data and IT played a central role in the company’s business model: not only did IT enable the company to successfully link the diverse stakeholders across the supply chain in daily operations, but the data residing in the company’s IT environment also became a potential source of value for the company’s future growth. The company’s future plan included creating an open IT ecosystem that would effectively connect different stakeholders. Commenting on the core competency of the company, the chief executive officer summarized the role of IT as follows: “What kind of company are we? . . . Are we a pharmaceutical company? Are we a supply chain company? . . . At the end of the day, we are (also) an IT company.”

The Transformation Imperative

Shanghai Pharma had established a leading position in China’s pharmaceutical market. Meanwhile, the rapid developments in China’s healthcare system and pharmaceutical market brought both opportunities and challenges. In addition to the growth of the overall healthcare market, several macro trends in the industry had particularly important implications for the company’s future strategy. First, China’s State Council ranked public hospital reform as its number one key priority; public hospitals, which traditionally served as the dominant channel for healthcare products and services, increasingly needed to improve operational efficiency, reduce cost, and increase adoption of information technology.[[27]](#endnote-27) Second, as China expanded its healthcare infrastructure, an increasing number of local hospitals, community clinics, and pharmacies were being created, diversifying the channels for drug distribution. Third, with more options for healthcare and more decision power, China’s consumers increasingly demanded high-quality services.

Another major trend across the Chinese economy and society was digital transformation.[[28]](#endnote-28) China’s rapid adoption of Internet technologies was significantly improving the efficiency of public-sector organizations and private-sector businesses, bringing productivity gains. In China’s domestic market, technology giants such as Baidu, Alibaba.com, and Tencent, and innovative technology start-ups such as Didi Kuadi (now Didi Chuxing)[[29]](#endnote-29) were driving a new wave of economic transformation. In the consumer space, Chinese shoppers were quickly moving online.[[30]](#endnote-30) E-commerce marketplaces, especially the top two players, Alibaba (owner of Tmall.com and Taobao.com) and JD.com (or Jingdong Mall), were becoming major retail channels where merchants interacted with consumers.[[31]](#endnote-31) Consumers had also embraced social media and online payment applications such as Tencent’s WeChat.[[32]](#endnote-32) Overall, innovative applications of the Internet and digital technologies could lead to entirely new products and services and create entirely new business models and market categories.

In healthcare, digital technologies had the potential to shape diverse activities. In a 2014 report, the global consulting firm McKinsey & Company identified a number of areas within healthcare where the Internet and digital technologies could have a significant impact.[[33]](#endnote-33) These areas included (1) enhancing public health management and services through electronic health records, wearable devices, and fitness apps; (2) increasing the accessibility of health resources through regional health information networks, hospital and physician review and rating platforms, online appointments, online consultancy platforms, telemedicine, and remote monitoring of patients with chronic diseases; (3) improving the quality and consistency of treatments through clinical-decision support systems, physician learning portals, and standardized clinical pathways for certain diseases; and (4) promoting innovation, productivity, and transparency in pharmaceutical and medical device segments through big data–driven R&D, drug supply chain supervision, electronic marketing to physicians, online patient education and services, and e-commerce for over-the-counter treatments.[[34]](#endnote-34)

Facing a changing industry landscape, Shanghai Pharma’s strong market position and comprehensive capabilities gave the company a significant advantage in China’s fast-growing healthcare market, where opportunities abounded. Meanwhile, the unprecedented dynamism and complexity of China’s healthcare system led the company to pose questions that had rarely been asked before. For example, how could the company prioritize different business initiatives and redefine its strategy? In the past, the company had leveraged its strong relationships with multinational pharmaceutical manufacturers; large, top-tier hospitals; and governments, and operated in the secure space between upstream drug manufacturers and downstream hospitals. Now, China’s entire healthcare system was undergoing fundamental and far-reaching changes, and the pharmaceutical supply chain was being disrupted by the emergence of multiple channels, intensified competition, and the increasing power of consumers, who demanded convenient, timely, and high-quality products and services from all players in the healthcare system. Shanghai Pharma began to rethink its business model. After much deliberation, the company repositioned itself as a provider of value-added services in the pharmaceutical value chain, as explained by the company’s chief executive officer: “Previously, we focused on pure distribution. In recent years, we have a major shift in strategy . . . We are going through a major transformation. What do we focus on now? Service, value-added service.”

Future Options

Shanghai Pharma could pursue a number of options for this transformation. Looking at the pharmaceutical value chain, the company had the potential to leverage technologies to expand its services in multiple directions.

Supply Processing and Distribution

The company could provide value-added supply chain outsourcing services to hospitals. Currently, major hospitals in China managed a significant portion of the supply chain, including their own central inventories and warehouses for drugs, medical devices, and other supplies. With its comprehensive capabilities in logistics, Shanghai Pharma could take over major supply chain activities of hospitals, thereby increasing efficiency, reducing cost, lowering the incidence of medical errors and malpractice, and improving patient satisfaction. Specifically, the company could manage the procurement, storage, and delivery of drugs and other products for hospitals, directly connecting manufacturers with end-users in intensive care units, emergency rooms, and operating rooms. This model of supply processing and distribution outsourcing would also enable Shanghai Pharma to move from a traditional model of “pushing” products to the market to a “pull” model, where products would be dispensed based on demand from customers. The healthcare industry in China was actively exploring supply processing and distribution as a future model for hospitals, and Shanghai Pharma could be well-positioned as a leader and early mover in this industry.

Direct-to-Patient Sales

The company could explore direct-to-patient sales, with a focus on high-end drugs. The direct-to-patient model provided for direct dispensing of drugs from pharmaceutical companies to patients and even customization of drug packaging and labelling. Such direct links to patients and consumers could open up avenues for growth. For example, in addition to convenient and timely delivery of drugs and related products, the company could diversify into value-added services such as patient education, data management, customer care, and services. In the business-to-consumer market, Shanghai Pharma could also consider partnering with China’s major e-commerce companies, leveraging its technology platforms to directly reach a large consumer base. Online pharmaceutical sales were widely adopted in the United States, and China’s online space also had much potential.

Data-Driven Innovation

Besides the above services, Shanghai Pharma’s large amount of data offered many other options. During the company’s decades-long interactions with diverse stakeholders in the value chain, including various manufacturers and hospitals, it had accumulated a rich set of data, which could not only help the company improve its own operations but also provide insights and recommendations for other parties. For example, based on its deep knowledge of patients’ consumption patterns, the company could help manufacturers optimize their packaging, promotion, and sales of different drugs. Converting data into a driver of growth would require a significant investment in integrating, managing, and analyzing the data. The company would still need to move further up the curve on the big-data business model maturity index (see Exhibit 3). However, the possibilities were limitless.

Towards a Digital Prescription

Over the years, Shanghai Pharma had successfully navigated China’s complex and ever-changing healthcare industry. In addition to the country’s ongoing healthcare reforms, the Internet and digital technologies had become key drivers of the transformation of China’s healthcare sector, and patients and consumers had an increasingly central position in this transformation. Shanghai Pharma needed to develop a strategic plan for its growth—a prescription for its own transformation in the age of digital innovation.

This work was supported in part by the National Natural Science Foundation of China (No. 71632008). This support is gratefully acknowledged.

Exhibit 1: forces driving china’s healthcare market

Source: Case authors, based on information from Franck Le Deu, Rajesh Parekh, Fangning Zhang, and Gaobo Zhou, “Healthcare in China: Entering ‘Uncharted Waters’,” McKinsey&Company: Healthcare Systems & Services, November 2012, accessed October 19, 2016, www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/health-care-in-china-entering-uncharted-waters.

**Exhibit 2: Pharmaceutical Value Chain**

Source: Case authors.

Exhibit 3: Big-Data Business Model Maturity Index

Source: Case authors; Bill Schmarzo, “Data Lake: Platform for Business Transformation,” Dell EMC, February 19, 2015, accessed November 8, 2016, http://reflectionsblog.emc.com/data-lake-platform-business-transformation/.

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