

Viewpoint: cost-effective health care developments and research opportunities in China, India and Singapore

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Abstract

Purpose – This study aims to show how major service developments in China, India and Singapore offer different perspectives on how cost-effective service excellence (CESE) can be achieved in health care. Resulting research opportunities are highlighted.

Design/methodology/approach – The study is based on the authors' in-depth experience in these three countries.

Findings – Digital platforms and related technologies seem more advanced in China than in most western economies in terms of their application, user acceptance and market penetration. The resulting digital ecosystem enabled innovation that provides CESE in digital health care. Second, India benefitted from a large health care market without excessive regulation, litigation risks and interlocking stakeholders. These allowed a number of organizations to achieve CESE through new business models and frugal innovation. Likewise, Singapore is a global leader in health outcomes while it also has one of the lowest health care cost per capita. This is achieved through focus on costs and productivity, standardization and digitization while being intensely focused on health outcomes and the patient experience.

Research limitations/implications – The three countries stand out in the ways they achieved CESE in health care and offer interesting research opportunities. China has fully integrated digital platforms with rapid innovation capabilities, India has extremely high volumes that met focused service factory and frugal service innovation approaches, and Singapore is a tightly controlled health care market with high levels of discipline, both facilitated by its culture and small size. These markets invite research to explore their successes in more depth and deduct lessons for CESE in health care elsewhere.

Originality/value – Together, the author team has decades of managerial, executive teaching and research experience related to service in Asia. The observations and reflections in this study originate from this unique perspective.

Keywords Digitization, Platforms, Cost-effective service excellence, Frugal innovation, Health care

Paper type Viewpoint

Introduction

This viewpoint article is based on the personal reflections of the three co-authors and their extensive managerial, executive teaching and research experience in Asia and the world. We identify and discuss in this article two major themes, namely, digitization and cost-effective service excellence (CESE) in the health care context. Here, CESE refers to “a state when an organization delivers simultaneously high levels of customer satisfaction and high levels of productivity” (Wirtz and Zeithaml, 2018, p. 61). In this article, we focus on health care services as it tends to be largest service sector in most developed economies with intense cost pressure and service quality issues at the same time (Berry, 2019; Kraus *et al.*, 2021).

Furthermore, we focus on three Asian countries (i.e. China, India and Singapore) as they provide the following unique insights for service academics and managers globally, with exciting implications for research and practice:

First, digitization, digital transformation and related technologies (e.g. mobile, artificial intelligence (AI) and analytics) seem more advanced in China than in most western economies in terms of their application, user acceptance and market penetration. The regulatory environment (e.g. consumer privacy

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regulation) and consumer psychology (e.g. consumer privacy needs and motivation) in China combined with an effective lock-out of western digital platforms (e.g. Google, Facebook, Twitter and YouTube do not have licenses to be used in China) resulted in a unique digital ecosystem. This ecosystem is in many ways different and arguably more dynamic, innovative and ubiquitous than, e.g. the ecosystem in the USA. Where American digital platforms entered, they often lost to their Chinese competitors, mostly by being out-innovated (e.g. Didi beat Uber largely though fast customer-centric innovation; [Wirtz and Tang, 2016](#)). China provides innovative case examples that can stimulate thinking on what might be possible in other markets.

Second, a number of business model and frugal service innovations related to CESE have had phenomenal success in India, especially in the health care context. India has benefitted from a large and private health care market that allowed the creation of focused service factories and frugal innovation. Likewise, Singapore has one of the most cost-effective health care systems globally with one of the lowest shares of the gross domestic product (GDP) of developed countries (around 5% of GDP compared to the OECE average of 9% and the USA with 17%). Yet, Singapore is globally leading in terms of health care quality indicators (e.g. life expectancy of over 82 years and a maternal mortality ratio of ten per 100,000 live births). [Bloomberg \(2014, 2018\)](#) regularly ranks Singapore as the number one or two globally in terms of health care efficiency, whereas the USA ranks near the bottom ([Wirtz, 2019](#)). In this article, we examine the business ecosystems in China, India and Singapore, with a view on potential research themes for the global service community.

Digital China

Digital China has unique characteristics as it largely developed its own ecosystem with no or only minimal involvement of the supply-side firms that dominate western markets. These typically include the “FAANG” firms’ ecosystems of Facebook, Amazon, Apple, Netflix and Alphabet. Instead, massive domestic platforms developed in China such as Alibaba and Tencent that dominate and effectively managed to organize the digital presence of China’s consumer base and the vast and digitally less savvy small- and medium-sized enterprise (SME) population. Initially, lacking infrastructure and antitrust regulations on technological giants, Chinese SMEs have learned lessons on giving up their data sovereignty, customer ownership and the rising cost from monopolistic digital platforms much earlier than their western counterparts. As [Chandy and Narasimhan \(2015\)](#) point out, the changes that the contemporary west has experienced (or is yet to experience) are scattered over decades, whereas emerging markets are undergoing change that is compressed in time. Especially when it comes to digital innovation and marketing agility, stricter regulation pertaining to data privacy and security may make it difficult for western firms to pursue marketing agility ([Kalgannam et al., 2021](#)).

An interesting observation when comparing unicorns in China to those from Silicon Valley is that US innovation has largely been technology-driven. By contrast, China’s business practices used to be rudimentary and government regulation on antitrust, privacy and intellectual property (IP) protection were inadequate. The relatively lower IP and consumer privacy

protection also resulted in faster innovation and more nimble firms ([Kane et al., 2019](#)). For example, Didi out-innovated Uber in China, with the latter deciding to exit the market ([Wirtz and Tang, 2016](#)). Therefore, Chinese firms focused more on innovation and improvement in the customer experience and journey, and the service model itself.

On the demand side, China has been the world’s most digital and efficient consumer market, while it has at the same time larger gaps in income, education and social mobility of its 1.4 billion population than most western economies. China’s advanced digital infrastructure supports highly digital and intelligent consumer experiences and journeys that lead to a “leapfrogging effect” of its previously underdeveloped emerging consumer markets. Its internet development has grown at a faster rate than its urbanization. China’s anticipated urbanization rate of 75% by 2035 translates into a social migration of 420 million people, a number larger than the entire US population. These digitally empowered consumers, mostly referred to as Gen-Z, are reported to have the strongest spending power in the world, with 13% of household expenditure as compared to 4% in Germany and France. This is due to the “six wallets effect” (i.e. two single children who married and have four parents to support them) as they are the second generation of the one-child policy (note, this was relaxed in 2015 to a two-child policy). They also show high patriotism for domestic Chinese brands and a growing need for recognition and self-expression.

Digital health care in China

Innovation in health care is needed urgently as cost pressure is intense, and service quality, both in terms of clinical outcomes and patient experience, is critical for the well-being of our societies ([Berry, 2019](#); [Ding et al., 2019](#); [Kraus et al., 2021](#); [Phares et al., 2021](#)). To address these challenges, China’s online health care services market have been growing fast. According to [VCBeat Research Report \(2020\)](#), the market reached US \$30bn in 2020 and is projected to grow at a compound annual growth rate of 53% for the next three years. In fact, markets seem to be at an inflection point with regard to productivity gains and service industrialization offered by developments in 5G, augmented reality (AR), AI and analytics (c.f. [Wirtz et al., 2018](#); [Wirtz, 2019](#)). In China, health care going digital is almost a matter of must-happen because of a lack of medical resources in rural areas; medical personnel and hospitals are heavily concentrated in the big cities. However, quality of care and patient experience cannot be compromised, and both patients and doctors have to be well-adapted to digital health care. Here, China can provide a unique testing ground for achieving CESE.

The Chinese government is gradually developing the regulatory framework to support the growth of online health care, which led to the entry of heavyweights like Alibaba and JD.com, with their enormous capabilities in traffic generation, promotional pricing and frictionless customer journey design. To compete, even traditional pharma is entering healthtech in a major way. For example, AstraZeneca China is transforming itself into a platform service provider for patients, doctors, hospitals and even other pharmaceutical companies. Note that China is AstraZeneca’s largest overseas market, contributing about 20% of total revenue of US\$27bn in 2020.

AstraZeneca China entered the online health care market with a US\$500m equal-equity joint venture with HillHouse

Capital Management to co-found the independent company, Yili Jiankang (<http://www.yilijk.com>). AstraZeneca has an excellent reputation in the medical community so that doctors trusted this platform backed by AstraZeneca, plus it had a large team of 4,500 well-trained detailing representatives, which was by far the largest among all pharmaceutical multinational companies (MNCs) in China. The large number of detailing representatives allowed AstraZeneca not only to penetrate deep into China, but also use its intimate knowledge about doctors to invite the most suitable ones to join its platform. Ideal doctors, according to AstraZeneca's definition, were those who already had their own sizable patient base as they would contribute traffic to the platform, resulting in low acquisition cost per patient. Furthermore, once doctors agreed to join, the detailing representatives would do all paperwork for them, from the registration with the government for the license to practice online to the account setup with the online platform. In other words, the representatives were able to eliminate regulatory "red tape" and other pain points for the doctors.

A few salient characteristics of the platform included a firm focus on low-cost and high-quality care. For example, patients' drug-taking compliance was monitored (with permission) and shared with their doctors to ensure quality health care. AstraZeneca drove the marketing of this digital platform with the aim to reduce transaction costs for both patients and doctors in the initial phase, and later shifted the emphasis to value creation by fostering long-term relationship between the key parties on its platform using AI and analytics for medical and behavioral insights (c.f. [Rangaswamy et al., 2020](#)). AstraZeneca also leveraged its global medical resources to provide up-to-date health care content via posts, short videos and live streaming to educate, engage and interact with their doctors and patients. Thousands of sales representatives transformed to online "agents" for their previously offline-engaged doctors to gain traffic, manage patients and sell products on this platform. These strategies and platform approach enabled this start-up to achieve CESE mostly to what [Wirtz and Zeithaml \(2018\)](#) called the operations management (OM) approach that effectively allowed it to deploy scalable systems and technologies while focusing on service excellence.

AstraZeneca started this project in mid-2020, the platform became operational in January 2021, and by the end of March 2021, over 40,000 doctors with 3,800 affiliated hospitals and clinics across 31 provinces had signed up. This was by far the fastest and most successful healthtech start-up in terms of number of active doctors in an online health care business globally. On the one hand, China's recent health care policy reform with the aim to cut medical costs resulted in a decline in prescription drug sales for foreign pharmaceutical firms. Thousands of AstraZeneca's sales representatives were no longer allowed to enter public hospitals. On the other hand, it accelerated the digitalization processes of traditional pharmaceutical companies, making China a unique experimental ground for online health care services.

Cost-effective and excellent health care services in India and Singapore

The global health care sector is far from achieving CESE. Rather, it is often notoriously poor in productivity and quality ([Berry, 2019](#); [Wirtz, 2019](#)). However, selective health care

groups in India and the public health care sector in Singapore have managed to overcome these challenges.

Narayana Health delivers cost-effective service excellence in India

Narayana Health has been successful in delivering cost-effective health care services with high patient satisfaction and excellent clinical outcomes ([Wirtz and Zeithaml, 2018](#)). In fact, Narayana Health is one of the lowest-cost health care provider in the world with high patient satisfaction. An endoscopy costs about US\$14, a lung transplantation US\$7,000, and an open-heart triple bypass surgery US\$2,400 ([Bloomberg, 2019](#); [Wirtz, 2019](#)). In spite of the low costs (and prices), Narayana delivers service excellence as is shown by the many awards it won which include the *Gold Award in Customer Service* by Asian Hospital Management Awards 2014 ([Hospital Management Asia, 2014](#)), the Frost and Sullivan India Healthcare Excellence Awards – Healthcare Provider Company of the Year 2012 ([Frost and Sullivan, 2012](#)) and the *Economist Business Process Reengineering Award 2011* for reducing health care costs by using mass-production techniques. Dr. Shetty, founder and chairman of Narayana Health, was even called the "Henry Ford of Healthcare" ([Economist, 2011](#)). Narayana performs more heart surgeries at a lower cost and a lower mortality rate than leading American hospitals (c.f. [Wirtz and Zeithaml, 2018](#)).

Narayana uses two strategic pathways toward CESE in a highly successful manner ([Wirtz and Zeithaml, 2018](#)). First, it uses a focused service factory strategy whereby Narayana focuses on serving the largely homogeneous needs of tightly defined target segments. It decided against building general hospitals that would have intertwined many service processes and patient requirements, and therefore would have been complex and expensive without the same quality output ([Global Health and Travel, 2014](#); [Govindarajan and Ramamurti, 2013](#); [Wirtz, 2019](#)). Instead, it built separate focused facilities for cardiac surgery, neurosurgery and gastro surgery, among others. This focused factory approach allows simplicity, repetition, homogeneity and experience that breed competence, improvements, innovation and lower cost ([Skinner, 1974](#)). These, together with Narayana's leadership and service culture that focused on service excellence, resulted in excellent clinical outcomes and experiences.

The principle of a focused service factory is simple. A specialist service operation that delivers a single product to a tightly defined target segment will be better, faster and more productive compared to a generalist facility that must cater to a wide range of customer needs. "If a service fits the requirement of a focused service factory, it will win hands down in most cases" ([Wirtz, 2019](#), p. 102).

Second, Narayana uses a dual culture strategy, which focuses the entire organization on the simultaneous pursuit of service excellence and productivity, and makes both integral parts of its culture. Dr. Devi Shetty stated, "The notion that 'if you want quality, you have to pay for it' went out the window a long time ago at Narayana Health" ([Global Health and Travel, 2014](#), p. 44). Text messages on the previous day's expenses are sent to senior employees to encourage cost consciousness and motivate them to generate ideas on how to reduce costs and improve processes ([Govindarajan and Ramamurti, 2013](#)). Frugal innovation also plays a role. For example, the hospital explored how to reuse medical devices that are sold as single-use products – the US\$160 steel clamps that are used during open-heart surgery are now

sterilized and reused up to 80 times (Bhattacharyya *et al.*, 2011; Govindarajan and Ramamurti, 2013).

Narayana Health is only one of several examples of Indian health care groups that achieved CESE through a combination of focused service factory and dual-culture strategies. Others include the famous Aravind Eye Care and AIG Hospitals (Govindarajan and Ramamurti, 2013; Rangan and Thulasiraj, 2007; Wirtz, 2019). For example, due to frugal innovation, Aravind Eye Care performed over 450,000 eye surgeries annually at a cost of US\$18 per patient (Rangan and Thulasiraj, 2007; Aravind, 2021). Aravind Eye, also called the “McDonalds of Eye-Care,” has been successful in maintaining high clinical quality and high customer satisfaction at rock-bottom costs by deploying its unique assembly-line approach that enabled it to increase its productivity tenfold (Aravind, 2021).

Similarly, AIG Hospitals has become the world’s largest single-specialty gastric sciences hospital with over 1,000 beds. Its cost-efficient business model is driven by economies of scale and process efficiencies, which allowed it to provide large-scale, high quality and affordable health care. For example, its costs and price of a colonoscopy are US\$17 and US\$24, respectively. These compare to a typical cost and price in an US hospital of US\$2,500 and US\$3,600, respectively. The quality of AIG Hospitals is so good that it is the only hospital the Mayo Clinic, arguably one of the best hospitals in the USA, partners with in India (AIG Hospitals, 2021).

Singapore’s public health care services

Singapore’s leadership at the Ministry of Health pushes public health care providers, which cover some 80% of in care patients, toward CESE using transparency and benchmarking of key performance indicators that range from average wait times, successful surgery rates, infection rates and cost per treatment. For example, Yishun Health, a regional health system, which is part of the National Healthcare Group in Singapore, was implementing a patient value compass to track outcomes across four categories: clinical, functional, stakeholder experience and cost-effectiveness/productivity. This intense focus on health care outcomes and patient experience combined with innovation on how they can be delivered at reduced costs is a key driver of CESE in Singapore’s health care system.

For example, Singapore’s Ministry of Health has been implementing an electronic medical record system called Next Generation Electronic Medical Records, which standardized patient records throughout Singapore from data capture, information processing, benchmarking and enforcement. In addition to vastly better information, the records would be easily accessible to any physician or clinic a patient grants access to and thereby reduces duplication of data capture, testing and administrative load. The potential efficiency and quality gains such data can provide in combination with AI (e.g. in interpreting PET scans and suggesting treatment schedules; c.f., Bormet *et al.*, 2021) are substantial.

Furthermore, Singapore extensively uses the OM approach to achieve CESE (c.f. Wirtz and Zeithaml, 2018). Part of this approach includes pushing its entire public health care sector to streamline equipment, medication and consumables procurement and usage to improve efficacy, expertise and cost-effectiveness. For example, instead of letting knee replacement implant types proliferate, a few standard types are selected and their use is monitored (e.g. physicians have to justify if they use other types of implants). Volume lowers costs, reduces process

variability, allows process streamlining, eases process improvements and innovation, enhances training effectiveness and overall improves the expertise of health care providers with this particular process and implant (Wirtz, 2019).

Other ways Singapore pursued CESE include technology (intuitive self-service online reservation systems) and management of patient behavior (e.g. via text messages to confirm appointments, reminders a few days before the appointment and links to reschedule appointments if needed, deposits to be paid for future visits that are forfeit if patients do not show and have not rescheduled).

Overall, patient choice, behavior and autonomy are tightly managed with benefits for both providers and patients. The outcome is that patients are not over-medicated and over-tested (as there is little local lobbying, and litigation risks are lower than in the USA), get mostly medication that works and is procured via system-wide tender processes (typically generic drugs), expensive medication with no or only marginal incremental benefits is not freely offered (patients can request for them but may have to make out-of-pocket contributions toward their cost) and patients are nudged to keep to their scheduled doctor visits.

Discussion and research opportunities

The health care sector is arguably the most important sector in the global economy in terms of consumer well-being and GDP. Aging, lifestyle diseases, and ballooning expectations of the populations, especially in developed economies, are increasingly putting strain on health care systems (Berry, 2019; Ding *et al.*, 2019; Kraus *et al.*, 2021; Phares *et al.*, 2021). Furthermore, in much of the developed world in general, and the USA in particular, the complications of the interlocked stakeholders have resulted in an almost stalemate health care market that makes business model innovation difficult. Dr. Shetty quipped:

The best place on the planet for a hospital to be built is on a ship parked outside US waters [...] US regulations make it very difficult for hospitals to innovate and control cost” (Graboyes, 2021).

Furthermore, hospital groups, insurers and big pharma heavily lobby regulators and policy makers and jealously guard their high, and some would say, excessive margins. To make matters worse for the poor and underserved, innovation in these countries has mostly focused on creating products and services for rich and/or insured patients who tend to be on the global “top of the pyramid” (Christensen and Overdorf, 2000). Combined with excessive regulation, low risk tolerance, high litigation risks, regulators seem ineffective in driving change. By contrast, the CESE approaches in China, India and Singapore’s health care markets may offer regulators and market players alike new perspectives and alternative pathways for innovation toward CESE with interesting opportunities for service researchers.

In particular, China’s digital markets in general, and its healthtech market in particular, and the overall health care markets in India and Singapore developed in very different environments compared to their western counterparts. All three countries can be viewed as standing out in different ways that offer interesting research opportunities. China has highly integrated digital platforms with rapid innovation capabilities that have recently been extended to health care. India has extremely high volumes (e.g. of heart surgeries) that enabled focused service factory approaches. Finally, Singapore is, facilitated by its culture and small size, a highly controlled

public health care market (e.g. that can push standardization of public health care) with high levels of discipline (e.g. by its doctors and hospitals) that allow the system-wide implementation of standardization and other practices to drive clinical outcomes, positive patient experiences and low cost. The developments in these markets can be considered natural experiments that show how these relatively extreme environments impact ecosystems, their actors and outcomes. In other words, they offer interesting environments for service research, and we highlight a few suggestions below.

First, research suggests that weaker IP rights protection leads to lower return on investment in innovation (Zhao, 2006). China's online firms operate in an environment with relatively little IP protection, which makes business model innovation, rapid innovation and an intense focus on frictionless customer journeys and integrated platform ecosystems (e.g. super apps) more important for capturing value and protecting market share. Current research neglects these topics (c.f. Lu *et al.*, 2020; Mariani *et al.*, 2022; Mustak *et al.*, 2021). However, it would be interesting to see whether these factors could have similar effects in western contexts. For instance, would reduced IP protection in Western markets lead to more competitive markets with increased focus on non-IP-protected aspects of value propositions and shorter innovation cycles? Of interest would also be in-depth research on what makes Chinese digital companies in general, and its digital health care providers in particular, so much more agile, fast and customer-centric than most of their western counterparts. Given the business environment, market and cultural differences, new insights might emerge. Interestingly, the Chinese government recently began enforcing the National Security Law (e.g. on Didi and many other tech giants) in a more robust manner, which might provide a natural experiment for service researchers to explore the impact of regulation on innovation and strategic focus of these firms as they increasingly need to manage the tradeoff between speed to market and navigating governance and regulation (c.f. Kalaignanam *et al.*, 2021).

Second, China's relatively lower regulatory control over consumer data privacy can facilitate research on privacy and the wider field of corporate digital responsibility (CDR; Lobschat *et al.*, 2021). Chinese consumers seem to show higher acceptance of transparent consumer data, transactional data and data integration across platforms compared to their Western counterparts. China's super apps make consumers transparent to the platforms they transact on. It seems, Chinese consumers are willing to trade off convenient and virtually frictionless online service for less privacy. In addition, it is noteworthy that data compliance in China is multifaceted and highly sensitive under China's recent Cybersecurity Law, paying special attention to multinationals with operations in China. China may offer researchers again a natural experiment on the effects of privacy regulation and may hold lessons for western markets where younger internet users tend to have less and less privacy concerns.

Third, common to the success stories discussed are their pursuit of one or several strategic pathways toward CESE. These include the focused service factory approach (e.g. Aravind Eye Care), dual culture (e.g. Narayana Health) and/or the OM approaches and digitization (e.g. AstraZeneca, AIG Hospitals and Singapore's public health care system). There seem to be few of such examples in western markets. China's digital approach to

health care may also hold promised for western markets and requires, besides the enabling technologies (e.g. cloud technology, frictionless user interfaces, and data flow and control), the creation of entire ecosystems that protect doctor-patient rights, deal with insurance and payment, and have effective regulatory supervision and compliance. In a western market, we expect that it would require a large systemic player to take the lead and get buy-in from the many stakeholders involved. That said, however, in our view, the most important facilitating factor is the willingness to accept that online is indeed the future for health care services. As these are pressing issues, we invite global service researchers to explore how these pathways to CESE can be applied more effectively, more extensively and on a much larger scale to achieve low-cost-high-quality health care (Wirtz, 2019). In particular, we need more research on the challenges and their mitigation on how CESE business models, services and even individual solutions can be implemented. Here, the roles of regulators, private (e.g. in India) and public (e.g. in Singapore) health care providers and public-private collaboration need to be understood better.

Fourth, to establish the performance differential in terms of clinical outcomes, patient experience and productivity (i.e. cost), benchmarking studies seem particularly relevant. As such, follow-on work to dig deeper and to understand the underlying enablers and causes of the differences observed needs to be done.

Finally, one approach for encouraging innovation that seems to have been successful in many other industries (e.g. fintech) is developing regulatory sandboxes. In particular, we believe that creating more regulatory sandboxes in digital spaces and health care may allow alternative and better business models emerge also in the West. While we understand that risks involved in health care services are higher than, for instance, those in financial innovation, progress is needed urgently in health care, and current approaches do not seem effective. The potential benefits are significant, as has been shown in India where the necessity for low-cost-high-quality health care combined with India's entrepreneurial outlook, risk capital and focus on social impact yielded role model organizations the world can learn from. Perhaps, service research can help to better understand patient risks, perceptions and attitudes, and devise better operating models and business platforms that hardwire CESE into health care systems in many more countries.

In sum, we hope this viewpoint encourages more research on the idiosyncratic paths to CESE in China, India and Singapore's health care service markets. We believe that such endeavors can provide novel impetuses for service research.

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