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Made in India: Business Models for Affordable Healthcare

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Introduction

Indian civilization has had a long and rich history of giving and caring. The Hindu, Buddhist and Jain religious scriptures celebrated the notion of the wealthy and healthy taking care of the poor and the sick. Given the legacy of Indian civilization, since ancient times, Indian traders and businesses had engaged with society. Indian economy and Indian culture both have a rich and long history spanning around a few thousand years (Avari, 2007; Cohn, 2017). It is thus tautological to observe that both these intersected across a variety of points (Bose & Jalal, 2017; Gupta,

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2005). In Indian culture, the notion of giving and sharing has been well weaved in the tapestry of life and living (Sharma, 2007). Taking care of the destitute and the poor has been specially advocated in Hindu scriptures and philosophies as a virtue (Dalal, 2002; Kumar, 2010). In the Bhagavad Gita, taking care of the needy and the ill has been advised as a duty of the wealthy and the healthy (Bhawuk, 2011). In India, at the family level, drawn from these traditions of both 'Dharma' and 'Karma', the health care requirements of the elderly and the sick was expected to be the responsibility of the young and the able family members (Deshpande et al., 2005). The concept of hospitals was weak and home treatment of the sick amidst the warmth and emotive care of family members was practiced (Padma et al., 2009). The manned care and logistics of such care giving services was the duty of the many family members (James, 1994; Westerhof et al., 2001). Further, at family and household level in Indian families even until the early 2000s the notion of health insurance was largely absent (Ito & Kono, 2010). This was because, for the elderly in the family (like parents and grandparents) the young family (working) members undertook the healthcare expenses (Deshpande et al., 2005). This was the accepted and expected behavior, any deviation from this behavior was viewed as negative (James, 1994). In the last few decades, Indian firms have formed strategic alliances with foreign firms to educate and create a market for health insurance (Bhattacharyya & Shaik, 2009), resulting in the corporatization of the healthcare system in India. The chapter has been structured in the following manner. First an overview regarding the state of affairs of healthcare in India is provided. Second, innovations in healthcare management in India are discussed. Subsequently, the key characteristics of Indian healthcare management system are explained. In future comparative analysis of various business models could be carried out.

Healthcare in India

In ancient and medieval India, traders and business owners were expected to feed the hungry and support the insalubrious sections of society (Bhattacharyya et al., 2009; Muniapan & Dass, 2008; Muniapan,

2014). This was the expected good behavior to be followed that is 'Dharma' (Ketola et al., 2009). Further, taking care of the ill was also according to Hindu scriptures and philosophy rewarding for life later or even in after life so this was good 'Karma' (Bhattacharyya, 2011). This narrative was emphatic in Indian traditions for thousands of years and this legacy continues to the present day (Sharma, 1973). The teachings of 'Bhagavad Gita' had been a core anchor of this perspective throughout ages in India. In modern times, multiple perspectives have been derived regarding the dos and don'ts about management of firm and the behaviors of managers based upon the teachings of 'Bhagavad Gita' but one that had reverberated in multitude has been regarding the notion that business firms being expected to contribute toward society (Chinna et al., 2009; Sharma, 1999). The theme of healthcare as a sector was well aligned in such thinking (Chakravarthi, 2011). The work of Mahatma Gandhi further reinforced this thinking (Chakrabarty, 2006). Gandhi also argued that business houses should take care of the weaker sections of society specially the sick (Ketola et al., 2009; Rivett, 1959). In India, the notion of Corporate Social Responsibility (CSR) has a long and highly embedded background (Muniapan & Satpathy, 2013). One could argue that the concept of CSR had evolved into widespread practice in India long before the idea of CSR became popular in the Western developed world (Bhattacharyya et al., 2009).

In India, the provision of healthcare both in terms of Indian political philosophy and socio-cultural milieu had been a duty of rulers and states (Altekar, 2002; Thapar, 1990; Tripathi, 2004). This was based upon the notion of 'Dharma' (Chattopadhyay, 2007; Dam, 2015). Thus, healthcare infrastructure was a priority area for both the state as well as the traders during ancient and medieval India (Thapar, 2015). This tradition continued in the twentieth century when big Indian business houses like the Tata Group established hospitals to facilitate treatment (Chakravarthi, 2011). These hospitals most importantly treated patients who belonged from weak economic background in society (Shah, 2014; Srivastava et al., 2012). Thus, the thoughts and actions surrounding business participation in health care has been a continuing conversation (Chakravarthi, 2011). Given the background of the notion of CSR as mentioned earlier, Indian corporations had addressed healthcare as a part

of its CSR agenda (Bhattacharyya, 2012). This was apart from the firms that were operating in the healthcare space (Rohini & Mahadevappa, 2010). However, both set of firms confronted two predominant challenges. First, the dearth of infrastructure both soft (human capabilities) as well as hard (equipment and physical infrastructure) in the Indian healthcare space (Bhandari & Dutta, 2007; Ramani & Mavalankar, 2006; Rao, 2012; Rao et al., 2011). The second being the expectation, that quality healthcare was required to be provided at affordable rates (Kumar, 2009; Modi, 2011; Pramesh et al., 2014). This should come as no surprise in India as there has been presence of substantial section of economically poor population (Thorat et al., 2017). This had been christened as Bottom of Pyramid (BoP) customers, who have been living in survival mode far removed from the wellbeing state, as they couldn't afford pricey things in life like tertiary healthcare (Lenssen et al., 2012). The BoP individuals are the ones who earn less than Indian rupees 5,000 per year or Indian rupees 70 to 150 per day, on a daily basis. Primary and secondary healthcare consisted of sub centers and Primary Health Centres (PHCs) which took care of minor and moderate ailments. Tertiary care involved medical colleges which took care of serious ailments. However, the inability to pay didn't diminish the BoP customers desire for quality products and services (Jaiswal & Gupta, 2015), like healthcare at affordable rate across various ailments. Some of the major ailments and BoP expectations were regarding receiving affordable dialysis or kidney transplantation for chronic renal failure or inexpensive chemotherapy for treatment of cancer (Chatterjee et al., 2013; Jha, 2004; Pal & Mittal, 2004). Even for pharmaceutical drugs the expectation has been that life saving and critical drugs should be affordable for BoP customers (Sawant, 2014). Such expectations were across a wide range of diseases specially regarding tertiary care (Lenssen et al., 2012).

India is a large country with wide geographic distance between the urban pockets inter spaced with rural areas. In India, there are government hospitals, private hospitals, nursing homes and private practitioners (who either operate from their own office or from a pharmacy store). Further, doctor as an entrepreneur was a unique aspect of Indian healthcare system. The aim of each one of these has been to cater to the requirements of different sections of society based upon ability to pay,

types of disease as well as location. However, India has one of the lowest ratios of doctors and paramedics to the size of population and tautologically the number of patients in the world. So, the business of providing healthcare service to such a large population, which is geographically dispersed, is resource intensive and investment heavy (Alur & Schoormans, 2011). Indian hospitals could be segmented across high end to very low end. High end hospitals catered to the needs of high net worth individuals (HNI). Government hospitals in India generally are the mainstay of medical treatment of the poor. Premium hospitals in India are exclusively catering to the rich and famous. Many of the premier hospitals in India have however started earmarking certain amount toward the economically needy patients as part of social responsibility and proactive responsiveness.

In soft infrastructure like manpower such as, doctors and health paramedics have been involved (De Costa et al., 2009). Historically, Ayurveda practitioners catered to the Indian populace at large (Mishra et al., 2001). Since the advent of the British, modern practices of medication (dominantly allopathy) and its service infrastructure got developed (Banerji, 1973; Jaggi & Chattopadhyaya, 2000). This was constituted by doctors, paramedics and even pharmacists (Richards, 1985). Thus, medical colleges, nursing institutes, pharmacy colleges and such others got developed (Kumar, 1997). Post-independence the government of India through its five-year plans expanded these infrastructures so as to develop more medical professionals to dispense quality services (Pandve & Pandve, 2013). Subsequently, the participation of private players was allowed to meet the ever-soaring demand for healthcare (Shah, 2010). Shortage of doctors in India have always been a cause of concern especially in remote and rural areas (Bajpai, 2014; Deo, 2013). In India, given the large population and its geographic spread, it required distributed medical facilities manned with doctors and paramedics in these locations (Deo, 2013; Kumar et al., 2007; Patil et al., 2002).

Often, India has been viewed as a country that lacked entrepreneurship (Medhora, 1965; Patel & Chavda, 2013; Tripathi, 1971). In recent decades it has been pointed out that India displayed abundance of entrepreneurship (Dana, 2000). It has been evident in the ubiquitous

street side vendors lying in plain sight of most passersby on roads. Over the years, in the healthcare space also this omnipresence of medical services entrepreneurship has been evident. In India studying medicine has been both expensive and time consuming. Medical students often aimed to provide medical service to the geographically defined community where they grew up. This was because, while growing up in these communities it became evident to the young medical profession aspirants that medical services were mostly absent or were poorly present. Becoming a doctor was not an individual goal but rather a community goal. If a student did well in medical examination and secured admission into a medical college, then the entire community felt elated as they wanted someone of their own to be a doctor. So, when these young students cleared medical examinations the entire community rejoiced. Thus, the notion of strong bonds with such a community as expected. After becoming a doctor often such individuals were interested to set up a medical clinic to serve their geography centric community. Thus, a doctor also became an entrepreneur. However, such doctors often faced challenges related to management of finance, real estate, human resource management and business strategy in their owned new medical clinics (Rhodes, 2012). This was because the doctor for starting up the medical clinic in their neighborhood competed with other entities for setting up the enterprise and often lacked business management expertise (Chatterjee, 2008). This still continues to be a challenge for the doctors' who had ventured into entrepreneurial ventures and were dependent on others for securing management expertise. Policy level focus from Indian government was then much needed (Golechha, 2015).

Health paramedics manpower in India also evolved slowly and has been becoming a very important subcomponent of the healthcare ecosystem (Motkuri et al., 2017). In the developed countries, healthcare ecosystem has been well built. In India, the offtake of the health paramedic segment had been slow (Rao et al., 2013). This was also because in India cultural (as mentioned earlier) relationships were not transactional but one of giving care. As has been already pointed out, in India the young took care of the elderly when the sick or the elderly required support. In Indian joint families, the extra pair of hands would always be extended for a worthy cause such as taking care of elderly who

were sick. In the last decade, with increase in the number of nuclear families, both spouse working families and such emergent realities the need of paramedical support at home became a business reality. Even then the notion of 'Dharma' still resonated in the minds of a young family members to serve an elderly who were ill. Dedicated paramedic and assistant services have been developing over a period of time but still there remained a hiatus. Thus, to serve the Indian healthcare market, innovative thinking has been much required to develop both hard and soft infrastructure and provide it to BoP customers at affordable rates.

Innovations in Healthcare Management in India

Indian civilization had always had technology as a key element in the socio-economic landscape since ancient times (Bhardwaj, 1979). India always had relatively larger population base, thus, to serve such vast base of population with limited resources required a frugal way of thinking (Annala et al., 2018; Banerjee, 2013). The notion of 'Jugaad' has been one such aspect that transcended the Indian cultural (Prabhu & Jain, 2015). This entailed the twin perspectives of frugality and conservation emphasized, in the absence of plenitude of resources (especially technological in nature) in the Indian business realm (Kumar & Bhaduri, 2014; Prabhu & Jain, 2015). 'Jugaad' thus was a way of thinking regarding how more value could be created with less resources (Tasavori et al., 2016). Verma and Bhattacharyya (2016) noted that there was substantial scope for application of emerging technologies for serving BoP markets at low costs. Healthcare in India was a sector that required such innovative thinking not just as fragmented islands but one which was omnipresent (Bound & Thornton, 2012; Honavar, 2019). Thus, in healthcare in India, both technology as well as 'Jugaad' thinking worked in tandem to provide affordable health care. Even in Indian health insurance industry, technology has been deployed to serve the previously unserved (Nayak et al., 2019a, 2019b). Thus, technology in healthcare as a narrative has been slowly building up momentum but the essence was in arriving at a favorable benefit to cost ratio.

The various aspects surrounding healthcare in Indian context in terms of its numerous elements like hard infrastructure, capabilities, innovation and business model are presented in Table 12.1. The articles selected the analysis are based upon the search keywords of 'Indian healthcare', and 'Indian Innovation' in the title, abstract and keywords. A total of 42 articles were reported based upon the search, out of which the authors selected thirty-five articles for detailed analysis. Seven articles were not selected for detailed analysis as the authors felt that these articles made marginal contribution.

The authors also tabulated a dozen best-case examples in Indian healthcare spanning the entire spectrum of healthcare products, services, process and business model. These are presented in Table 12.2.

The authors synthesized the themes emerging from the discussion of articles reported in Table 12.1 and cases reported in Table 12.2 to identify unique aspects of Indian healthcare industry, system and management. In the next section, the authors conclude the insights drawn from the current analysis and also highlight the directions for future research.

Key Characteristics of Indian Healthcare Management

A synthesis of Tables 12.1 and 12.2 has been prepared by the authors and is tabulated and presented in Table 12.3. From Table 12.3 it can be inferred that there are four innovations that were prominent. These are 'Product', 'Service', 'Process' and 'Business model' innovations. As per the perspectives provided in Tables 12.1 and 12.2, product innovation manifested into the launch of new product offerings while service innovation leads to introduction of new service offerings. The process innovation entails new ways of doing firm activities while the business model innovation incorporated firm efforts that altered the firm sources of revenues and the way of doing business.

The two benefits that transpired from these four types of innovation are cost reduction and better-quality management. One could note that in all four innovations in the Indian health care system cost reduction occurred. Four stars (****) depicts very high-cost savings, three stars (***)

Table 12.1 Indian healthcare landscape

S.No	Author(s)	Findings	Methodology	Context
1	Ramdorai and Herstatt (2017)	In all the GE Healthcare's products introduced in the developing world (including India) the key consistent features were low complexity, high ease of use, high reliability and high serviceability. In product design environmental fit, local use cases, cost effectiveness and clinical efficacy were also ascertained. Authors identified that GE was able to overcome innovator's dilemma (Henderson, 2006) by having a dedicated process, reconfigured values (Healthymagination initiative), dedicated resources and long-term capability development. Authors had found that ambidexterity of differentiated and integrated structures as well as an overarching vision would help organizations to serving low-income market segments in health care	Exploratory case study methodology was chosen for this research	Authors explored the approach & process required to develop successful products/services for the BoP markets in healthcare
2	Bhatti et al. (2017)	Authors argued that healthcare needs should be the prime source of motivation behind product development. Identification & diffusion of frugal healthcare delivery innovations were identified as key challenges by the authors	An exploratory and non-experimental descriptive mixed methods research design was chosen to search for, assess and analyze frugal innovations in healthcare	Authors comprehensively searched for frugal innovations which could be undertaken for reverse diffusion into the healthcare system of developed economies

(continued)

Table 12.1 (continued)

S.No	Author(s)	Findings	Methodology	Context
3	Mukerjee (2012)	Author proposed that affordability (with state-of-art quality) and knowledge of target customer's critical conditions were the two most critical factors to be considered when innovating for the low-income market. Author has also proposed that firms must reconfigure the firm value chains in order to facilitate frugal innovations in emerging markets	A conceptual study was undertaken	Author recommended the approach required to develop product and service offerings that would succeed in emerging markets
4	Agarwal and Brem (2012)	Authors advocated that the success of MNCs trying to innovate for the low-income market depended upon the proximity of the entire value chain to the local market. This was identified as a critical factor. Further, firm management had to completely understand the core value needs of the targeted customers. Firms were advocated to also focus for reverse innovations because frugal products could also had potential for the developed world	Qualitative analysis & evaluation of Seimens SMART products was done	Authors focused on the strategies adopted by MNCs for establishing themselves into emerging markets like India

S.No	Author(s)	Findings	Methodology	Context
5	Kumar et al. (2011)	Authors identified several policy responses needed to transform the healthcare delivery in India. These are, first the introduction of appropriate incentive systems to ensure that the states were financially rewarded for effective use of allocated funds. Secondly, the steps needed to improve performance, efficiency & accountability of public healthcare delivery was required to be well laid out. Further, the policy and legislative changes that would be required to contain the rising medical expenditure had to be ascertained. The authors also recommended that a single payer system would prove to be advantageous in Indian context	Publicly available health financing & health expenditure data of 14 major Indian states were analyzed	Policy interventions required from the government side to achieve an inclusive healthcare ecosystem in India was suggested
6	Berman (1998)	Author highlighted that private ambulatory care providers held critical importance in India's healthcare system. Author also argued that in Indian context, it was impossible to completely substitute public system with private provision. Hence, interventions were required to be focused on improving the efficiency and coverage of both public and private healthcare services	Publicly available health-related data was studied to develop a conceptual framework	Author examined the role of private healthcare institutions in India for serving the needs of its vast heterogeneous population

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Table 12.1 (continued)

S.No	Author(s)	Findings	Methodology	Context
7	Ramdorai and Herstatt (2015)	Authors grouped the main challenges of doing business at the BoP as market challenges, distribution challenges and organization challenges. Authors argued that just introducing cheaper products would not guarantee success in the market. Instead, firms managers were required to immerse themselves in the BoP market to get a comprehensive grasp of customer needs and develop product that fit the buying power of the market. Authors depicted that disruptive innovations were critical to serve BoP markets. Also, in the context of emerging markets, authors demonstrated how successful firms interlinked frugal innovations, inclusive innovations, reverse innovations, 'Gandhian innovations' and disruptive innovations. Authors highlighted that best cases like Narayana Health (NH) and Arvind Eye Care Systems (AECS) innovated for BoP markets could as well be significantly utilized in the developed economies. Extreme need for cost-effectiveness, clinical volumes & BoP specific knowledge were the key drivers behind NH and AECS like innovations. Authors also advocated that firm managers needed to create new value networks having innovative partnerships and affiliations to cater to the needs of BoP market. Authors suggested that developed market firms scouting disruptive innovation	Exploratory case study method was followed	Authors discussed the importance of frugal innovations in serving the BoP market. Characteristics and features required for success of frugal product/service offerings were examined

S.No	Author(s)	Findings	Methodology	Context
		could either focus directly toward BoP markets or co-develop solutions with local firms serving the BoP market. Emerging economies like India were viewed as appropriate for disruptive innovations because of significant resource constraints and significant volume of unmet needs. For developed market, firm managers could innovate with lessons picked up from the highly price sensitive emerging economies which were previously not using advanced products or were using a poor substitute. In addition to price, the new value segment products should include portability, reliability and ease of use as key performance attributes for success. Authors have suggested that MNCs tying to serve BoP markets could learn the ambidexterity of differentiated and integrated structures from GE healthcare's healthymagination initiative. Authors used the case of 'Tata Swach' to advocate that senior leadership in the firm would play a significant role in success of disruptive innovation. Authors also identified that there could be static structural ambidexterity (GE Healthcare) and dynamic structural ambidexterity (Tata Swach) which could enable a firm to achieve success in BoP market. Authors suggested that in order to serve the vast unmet needs of Indian healthcare ecosystem, firms could set up local R&D units to pursue disruptive innovation		

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Table 12.1 (continued)

S.No	Author(s)	Findings	Methodology	Context
8	Prahalad (2012)	Author emphasized that firms must operate on 4A model. The 4A's being awareness, access, affordability and availability for developing products for the BoP markets. The author also suggested that the products developed should be modern, have aspirational value, adhere to global safety standards, be scalable and most importantly be affordable. The author advocated that instead of just developing a product, BoP innovations should develop an ecosystem that would enable a new business system to thrive. The author had also argued that emerging markets were critical for sustained and profitable growth of global firms. Also, the experience gained in BoP markets would enable the firms to enhance its global competitiveness	A conceptual study was undertaken	The process and approach of developing products for BoP population has been elucidated and tested using a live example
9	Tiwari et al. (2014)	Authors propounded that active search of inventive analogies in other industry domains and openness of management as well as development teams would play a critical role in successful development of frugal innovations. Authors also argued that firms could substantially reduce its development costs & time by incorporating inventive analogies (within-industry & cross-industry) toward product development	Cases of three frugal innovations from India were studied	Role of applying inventive analogies in the development process of frugal innovations was studied

S.No	Author(s)	Findings	Methodology	Context
10	Tiwari and Herstatt (2012)	In addition to the 4A's model, the product developed for emerging markets should have a specific value proposition, volume opportunities, a robust design, fault resistant mechanism and low cost of ownership. Authors advocated that an emerging market like India perfectly befit the definition of lead market. Hence, firms were required to actively participate in Indian market to identify the market needs early and develop products that could even get diffused overseas	Cases of four successful product innovation from India were studie	Factors impacting India's potential as a lead market for frugal innovations have been studied
11	Gardner et al. (2007)	Authors suggested that local R&D partnerships and policy networks led by developing countries could help in significant enhancement of global healthcare system	A conceptual study was undertaken	Authors elucidated the importance of R&D partnerships and implementation research networks in the enhancement of global healthcare system
12	Engel et al. (2012)	Authors argued that in addition to developing new tools, healthcare delivery models (inclusive to all stakeholders) must be given due importance	Meeting report of a conference themed on "TB diagnostics in India: from importation and imitation to innovation" was developed	Alternative ways of innovating new diagnostics that would fit in the local context was studied

(continued)

Table 12.1 (continued)

S.No	Author(s)	Findings	Methodology	Context
13	Brown and Wyatt (2010)	Authors advocated that by adopting design thinking (inspiration, ideation, implementation), organizations could be a better enabler in developing successful social innovations	A conceptual study was undertaken	Importance of design thinking to develop social innovations was elucidated
14	Prabhu and Jain (2015)	Authors highlighted that combination of grassroot innovations (jugaad) with formal business process would help to serve the need of emerging markets across the globe. Authors also identified frugality, flexibility and inclusivity as key characteristics of jugaad innovations	A conceptual study was undertaken	The concept of jugaad and its relevance in Indian context for innovation and entrepreneurship was studied
15	Bhowmik et al. (2013)	Authors advocated that low-cost tele-medicine model and other remote healthcare delivery solutions would significantly bridge the existing gap in Indian healthcare ecosystem	A conceptual study was undertaken	Opportunities of transforming healthcare through tele-medicine technology have been explored
16	Govindarajan and Euchner (2012)	Authors identified that the five key factors which differentiated the needs of developing market from the developed market were performance gap, infrastructure gap, sustainability gap, regulatory gap, and preferences gap. Authors have argued that reverse innovation would help global firms to gain sustained competitive advantage	Conceptual study was done consisting of eight case studies of innovations done by global firms in emerging markets	Role played by reverse innovation in tapping the emerging markets in the developing world was studied and highlighted

S.No	Author(s)	Findings	Methodology	Context
17	Esposito et al. (2012)	Authors identified the key operating principles of BoP healthcare. These are listed as- • Non-homogeneous BoP market must be clearly segmented • Firms should focus of 4As model & scalability in product/service offerings • Engaging the BoP with help firms in building trust and transparency • Firms could follow NH and AECS models of local capacity building for bridging demand supply gap of skilled resources • Experimentation of products and services would premise a successful BoP venture • A collaborative network would be required to build a sustainable BoP business venture • Firms should focus on end-to-end needs of the BoP market • Technology would prove to be a game changer in BoP product/service offerings • Firms must build a decentralized organizational structure and passionate leadership to achieve success in the BoP market In order for firms to be successful, firms were required to incorporate these elements in the BoP healthcare market	Empirical study of published case studies was done	Underlying principles of innovative business models aimed at providing affordable healthcare to BoP population was examined

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Table 12.1 (continued)

S.No	Author(s)	Findings	Methodology	Context
18	Malik et al. (2017)	Authors argued that Human Resources Management (HRM) practices would play a significant role in driving ambidexterity and flexibility in the organization. This was noted as central to building sustainable low-cost healthcare solutions	Cases of two healthcare organizations were studied	Role of HRM practices in resource-constraint innovations were examined
19	Kapoor and Goyal (2013)	Authors argued that all the three successful organizations studied had similar strategies for value offering, operations (passionate leadership & continuous cost control), finance (focus on cost control and technological integration) and customer engagement (focus on building trust and transparency). Scalability and technological focus also helped significantly in achieving success Authors recommended that BoP segment should also be viewed as a producer, employee and micro-entrepreneur hence, all stakeholders must be engaged to drive the healthcare service	Empirical study of three firms having innovative business models was done	Social business ventures serving the healthcare needs of BoP population using sustainable and innovate business model alterations were studied
20	Keown et al. (2014)	Authors argued that cultural factors would foster innovation diffusion in an organization. The seven key cultural factors identified were empowering patients, engaging healthcare professionals, adapting innovations to the local context, identifying and supporting champions, promoting learning, new ways of working, eliminating legacy practices, and promoting future transformation	Conceptual framework was developed using data of healthcare innovations from eight countries	Emphasis on attributes required for global diffusion of healthcare innovations was presented

S.No	Author(s)	Findings	Methodology	Context
21	McMahon and Thorsteins-dóttir (2013)	Authors advocated that developing country firms were not only getting well established into low-cost products but were also parallelly developing high-tech products/services to meet the vast demand of local healthcare market	Conceptual study based on Regenerative Medicine (RM) activity data of three countries	Authors discussed the occurrence & characteristics of high-tech innovations like RM in developing countries
22	Velamuri et al. (2015)	Authors highlighted that focused customer identification, proactive customer engagement, innovative revenue models, resource optimization, quality control, cost control and in-house talent developments were key features of success in balancing financial and social aspects of business. Authors also advocated that in addition to direct impact, organizations like AECS influenced national and international healthcare outcomes	Exploratory case analysis of three hospitals in India was carried out	Authors documented the contribution of business model characteristics in the ability of organizations to deliver high-quality healthcare at very low costs
23	Hansen (2008)	Author argued that new healthcare markets, innovative Information Communication Technologies (ICT) solutions and patient-centered services were outrunning and outperforming the state-run healthcare systems. Hence, government bodies were advocated to upgrade the prevalent methods of healthcare delivery	A conceptual study was undertaken	Changing trends of healthcare market across the globe was discussed

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Table 12.1 (continued)

S.No	Author(s)	Findings	Methodology	Context
24	Shet and De Costa (2011)	Authors emphasized that mobile phones could potentially transform the current resource-limited healthcare via empowered connectivity of relevant stakeholders	Empirical study on 322 HIV patients was carried out	Opportunities of utilizing mobile phone technology and infrastructure for healthcare enhancement was explored
25	Singh et al. (2011)	Authors advocated that Indian innovation ecosystem was on the path of maturity and an increase in local emphasis was identified in the product/service development cycle. Authors also suggested that India should prepare itself for an open innovation ecosystem with close collaboration to extract the best solutions	A conceptual study was undertaken	Commonalities, enablers and certain characteristics of recent affordable innovations in India were discussed
26	Davidson (2015)	Firms were advocated to innovate its pricing structure, technology integration, marketing strategy or service delivery to serve the need of emerging markets. Author suggested that establishment of micro-venture funds, support from larger corporation and participation of intellectual talent would help India in creating successful business ventures which would serve the BoP markets	Exploratory case analysis was done	Author identified the factors responsible for success & failure of an innovation in the BoP market
27	Alur and Schoormans (2011)	Authors emphasized that the BoP markets could be well served by social franchisee expansion route. Authors argued that success of social franchisee expansion would depend of qualitative factors-based selection of franchisee	Exploratory field study was done in India	The article proposed an alternative method of solving the issue of BoP markets using social franchisee model

S.No	Author(s)	Findings	Methodology	Context
28	Parthasarathy et al. (2015)	Authors identified cross subsidization, robinhood model, use of ICT-based technologies, customer engagement as major factors which determined the success of firms in serving the BoP market	Case analysis of four companies was carried out	Authors analyzed different models & characteristics of product/service development for serving low-income segment
29	Moons et al. (2019)	Authors advocated that efficiency and performance of internal supply chain would critically affect the quality & service of hospital. Authors identified the elements that determined the efficiency of supply chain inside the hospitals	A literature review study was undertaken	Business criticality of internal supply chain performance of hospitals was studied
30	Haenssgen and Ariana (2017)	Authors argued that a detailed analytical assessment of sequential healthcare behavior would help in evaluation of entire healthcare delivery aspects	Original survey data from rural India and China containing 119 unique healthcare pathways among 637 respondents was analyzed	Importance of analyzing sequence sensitive and sequence insensitive healthcare behavior was emphasized
31	Budrionis and Bellika (2016)	Authors highlighted that Learning Healthcare System (LHS) which incorporated health data & patient's perspectives into healthcare models would enable for delivering customized care at lower costs with minimized consumption of resources	Literature review on LHS was carried out	Extant research on LHS was studied to identify opportunities and gaps

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Table 12.1 (continued)

S.No	Author(s)	Findings	Methodology	Context
32	Kumar et al. (2014)	Authors argued that Health Technology Assessment (HTA) should be adapted as tool for policy and decision making. It would enable to bridge the current gap of divergent and loosely coordinated healthcare organizations	A conceptual study was undertaken	Authors identified the use cases of HTA in Indian healthcare sector
33	Rebecchi et al. (2016)	Authors undertook a meta-analysis of projects that incorporated several local ground realities for effective response to healthcare needs of population in emerging economies	Three different healthcare levels were analyzed to develop the meta-project	Authors developed a framework for local-oriented healthcare delivery ecosystem
34	Arya et al. (2015)	Authors advocated that collaboration and alliances in high technology healthcare supply chain would significantly improve the cost effectiveness and performance of healthcare supply chain	Case of dental implants has been discussed	Importance of collaboration in high technology healthcare supply chain was emphasized
35	Kumar and Kumar (2014)	Authors proposed that modeling of healthcare supply chain using system dynamics would assist in effective policy making. Hence, overall healthcare delivery would be improved significantly	A survey study was conducted in the state of Uttrakhand in India to collect data for model development	Authors identified the gaps and opportunities in rural healthcare supply chain using system dynamics modeling

Table 12.2 Key firms involved in innovations for BoP healthcare in India

S.No	Organization	Innovation	Type of innovation
1	Jaipur foot	Manufactured and fitted low-cost prosthetic leg	Product
2	Aravind Eye Care	Hospital network that performed low-cost cataract surgeries for millions of patients through strategic cost control interventions	Process
3	Narayana Hrudayalaya	Hospital that performed low-cost cardiac surgeries and had expanded to other health services as well	Process
4	EMRI	Low cost emergency services were provided	Service
5	Lupin	Lost cost drug for psoriasis was provided	Product
6	TATA	Water purifier at a fraction cost of other available purifiers in the market to reduce incidences of illness caused because of consumption of contaminated water	Product
7	General Electric	Healthymagination, a technology based healthcare initiative	Business model alteration
8	LV Prasad Eye Institute	Affordable eye care to the poor	Service
9	LifeSpring Hospitals	Low-cost maternity care hospital chain	Service
10	Narayana Hrudayalya	'Yeshasvini Insurance Scheme' provided insurance for cardiac surgeries at an annual premium of only US$1.5 per annum	Business model alteration
11	Embrace Global	Low-cost incubators for preventing neo-natal deaths	Product

(continued)

Table 12.2 (continued)

S.No	Organization	Innovation	Type of innovation
12	Teleradiology Solutions	Delivered radiology services remotely	Service

Table 12.3 General analysis of Indian healthcare

Type of innovation	Cost reduction	Quality management
Product innovation	****	**
Service innovation	***	*
Process innovation	**	*
Business model innovation	*	**

depicts high-cost savings, double stars (**) depicts moderate-cost savings while single star (*) depicts marginal-cost savings. In quality management, when both quality of healthcare management as well as quality of healthcare infrastructure improved then it was depicted by double stars (**) while when quality of healthcare management improved but the quality of healthcare infrastructure deteriorated then it was depicted by single star (*).

Low-cost medical services are much needed in India, given two thirds of the population lives on a daily income of less than Indian rupees 150. With the notion of providing affordable healthcare to the BoP customers in tertiary Indian healthcare industry also attracts patients from the developed world (Western countries included) as well (Maheshwari et al., 2012; Reddy & Qadeer, 2010). Thus, given this context, India healthcare industry has become a world leader in affordable quality tertiary healthcare which had remained elusive to patients from other countries (see Maheshwari et al., 2012; Reddy & Qadeer, 2010).It would be important to note that India has been a leader in setting leadership position globally (Bhattacharyya, 2019). India has been the only major economy in the world where in CSR initiatives are made mandatory (Nair & Bhattacharyya, 2019). So, for the firms earning higher level of profit, sacrifice of significant amount of profit amount dedicated toward the

case of CSR spend was required (Gatti et al., 2018). This was two percentage points of the average net profits secured by the firm for previous three years (Nair & Bhattacharyya, 2019). In the healthcare industry, because of the past legacy of 'Dharma' and 'Krama' such sacrifice has rather been viewed as an investment. This investment was meant to be toward taking care of social aspects in business with society. The cause of Indian firms (as well as some foreign ones) has been aided with highly potent but relatively cheaper and low-investment technology. Healthcare thematic CSR has been pursued by firms extensively even when it hadn't necessarily been Strategic CSR initiatives (Bhattacharyya, 2010, 2012). This indicated the commitment of business firms toward the healthcare as a priority theme of intervention. Healthcare was an industry, wherein just seeking more profit (unlike any other industry) has not been seen as righteous. Indian hospitals have responded to this through taking care of economically backward patients. It would be important to note that the premier hospitals in India are industry leaders with the best possible doctors, most modern infrastructure and other facilities. These hospitals were islands of excellence in an otherwise ocean of weak healthcare landscape. The quest would be to innovate further technologically and more importantly through business model improvements so as to provide advanced healthcare facilities (like tertiary care) at affordable price points that the Indian mass population would be able to afford. Lean and 'Juggad' thinking along with application of emerging technologies would continue to be vital to cater to this worthy quest (Prabhu & Jain, 2015).

Individual Cognition and Behavior and Its Impact on Business Models and Innovation

One of the major directions that emerges from the above analysis is the need to explore the relationships between concepts embedded in traditions such as altruism and dharma and the contemporary entrepreneurship compulsions and behaviours (Tan et al., 2005). For example, how do the innovators incorporate, if at all, the concepts of dharma in the design of business models. Dharma is one of the four purusharthas

discussed in the traditional Indian literature, the others being kama, arth, and mokhsa that relate to the fulfillment of desire, creation of wealth and personal liberation respectively (Rajasakran et al., 2014). While kama and arth can be linked to the design of profitable businesses that can create wealth, dharma relates to the deontic motivation toward society. The extensive work on hybrid organizations has explored how the individuals (and organizations) manage the balance between the social cause (*dharma*) and profitability (*Arth* and *Kama*) (Smith et al., 2013) while the linkages between businesses and spiritual aspects captured in moksha has been largely unexplored. Future research can explore, whether there is, if any, significant impact of spirituality in designing business models or participation in CSR activities. How does the Gandhian concept of involvement of businesses in CSR activities relate to *dharma* and materialistic aspects or both? How do innovators and entrepreneurs look at their involvement along the four dimensions of *purusharthas*?

While many of the business models, especially healthcare technology related ones, are founded by non-medical professionals, some of these initiatives such as NH, AECS and Karuna Trust have been founded by physicians. The training of physicians involves spending more than a decade in learning clinical work and the curriculum prepares them for clinical practice. What motivates these professionals to indulge in entrepreneurship and innovative ventures? Where do the doctors gain knowledge and resources for the same? Investigating these questions would also allow researchers to understand the ecosystem required for stimulating innovation among medical professionals.

India has emerged as a technology hub in the recent years. There is a rapid growth of technology based startups in India, driven by the Government's push to promote an entrepreneurial culture in the country (Subrahmanya, 2017). Several of these startups target the healthcare space and attempt to contribute to affordability and accessibility. While some of these startups may be motivated by altruistic motivation, more often than not, the founders target profitable business models. It would be interesting to know the relationship between altruism and the types of business models in terms of target markets, pricing mechanisms etc. Further, many of these initiatives, though driven by profit motive, adopt the rhetoric of developmental impact (Chandra, 2016). Future research

should explore which type of startups attract funding agencies related to impact and development and which business models attract the private equity funds targeting quick profits. Further, though some businesses or innovations might be driven by profit, does the rhetoric emphasized by the founders and the funding agencies emphasize altruism and focus on dharma. Furthermore, it would be worthwhile to explore the antecedents such as motivations of these entrepreneurs to get involved in health technology. Also, the processual analysis of the innovation, from idea formulation to implementation to scaling up would illuminate what type of ecosystems are required for promoting these startups.

Organization Design and Business Models

There has been a substantial influence of Gandhian philosophy in the Indian thought processes. While the Gandhian philosophy emphasized localized solutions embedded in the context, the conversations in the innovation and entrepreneurship scholarship and practice focuses on achieving scale (Williams, 2019). Indeed the funding agencies and institutions look for scalability as the primary characteristic, which in turn is presumed to lead to future profitability. An interesting research question that needs to be explored is how do the entrepreneurs and innovators who are driven by Gandhian philosophy of caring, altruism and designing community based context-sensitive solutions marry the concept of localized solutions with scalability. The hub and spoke design of Aravind Eye Care System, for example, consists of rurally located small vision centers linked to the large hub hospital located in the urban area. The model provides for local connect and responsiveness as well as scalability. It would be interesting to understand the dilemmas faced by innovators and to comprehend how the innovators and entrepreneurs manage them. Some of the business models such as the provision of healthcare services for the elderly at home closely relate to an important aspect of dharma—taking care of the elderly. Traditionally, the Indian families had been structured as joint families where multiple generations of family stayed together and the work, including taking care of

dependent children and elderly, was distributed (Dhanaraj & Mahambare, 2019). With increasing prevalence of dual earner couples, especially in the fast growing urban population, has not only affected the care of elderly and children but also interfaces with the concept of dharma. Future researchers could examine how the businesses that provide care at home relate to the concept of dharma. Also, whether such initiatives develop and promulgate the rhetoric of dharma to push their businesses? And if so how do the customers perceive the same?

In the present analysis, we have examined multiple innovative models that provide affordable, accessible and quality healthcare to underprivileged populations. However, the literature, including our research, largely focuses on the successful models. There may be multiple reasons for the absence of literature on failed models, including lack of availability of data, the structured process of publication etc. However, we posit that an in-depth study of failed models or comparative analysis between failed and successful models can provide useful insights for both academicians and practitioners interested in comprehending the critical factors that lead to success/failure of such initiatives.

Furthermore, many such success stories represent pilot projects that have achieved success at a small scale. Studying projects that have scaled to programs or models that have sustained for long duration could highlight factors critical for scaling up of such initiatives. Further research is also required to examine the politico-social ecosystem required for supporting the innovations to scale and to sustain. Both scaling up and sustainability of the innovations are important for creating long-term value and impact.

Government Policies; Systems and Stakeholders

Several government regulations directly impact the design and implementation of innovations and initiatives related to socially relevant aspects such as health. One of the major recent being mandatory CSR spending for profit making organizations (Gatti et al., 2018). Future research can explore the impact of the CSR regulation on the

initiatives undertaken by organizations. There are many interesting questions that need to be examined. Is there any difference between the modes of spending in organizations operating in the healthcare domain versus those involved in other industries? Further, how has the regulation affected the CSR spending of the organizations that were already spending more than mandated 2% of their profits in CSR? How much percentage of the CSR funds goes toward provision of healthcare? Which aspect of healthcare attracts the CSR funds, primary, secondary or tertiary? Which one is the most effective and efficient way of involving organizations in CSR activities related to healthcare?

As shared above, innovation in the Indian context has been closely linked to the concept of 'Jugaad'—generating more value with scarce resources (Tasavori et al., 2016). While there have been several studies on the frugal design of products using jugaad, the same can be applied to developing relationships and using relationships as a resource for scaling up. Future researchers can explore how the entrepreneurs incorporate the concept of 'jugad' into the design of relationships among diverse stakeholders, such as managing PPPs or working with the government in a contractual relationship.

The public healthcare system in India has been designed in a three tiered system to enable access. The design envisaged a smooth interface between PHC (Primary Health centers) at the village level, CHC (Community Health Centers) at the Taluka level and District Civil Hospitals at the district headquarters. However, the public system, over the years, has not been able to deliver accessible, affordable and quality healthcare, resulting in mushrooming of the private sector (Bagchi et al., 2020). Recently, there have been several initiatives in a PPP (Public private partnership) mode where the two diverse stakeholders come together for delivering healthcare. Such initiatives have been implemented at all levels: Primary care, for example, Karuna trust and Tata Trusts have entered into agreements with respective state governments to manage primary health centers in Karnataka and Maharashtra respectively. While the Gandhian philosophy emphasized philanthropic

involvement of the private sector in the healthcare sector, the management of PPP involves building exchange based relationships, preferable long-term relationships, between the diverse stakeholders (Rajasulochana & Maurya, 2020). Such initiatives, if managed properly, can enhance the sustainability of the initiatives.

Conclusion

The above analysis presents several interesting areas for future research. The potential research areas have been described at three broad levels—Individual (entrepreneur/innovator's behavioral aspects); business models (organization design) and systems and policy level (impact of government regulations and policies on design of organizations and strategies adopted and involvement of multiple stakeholders). The authors emphasize that these levels are representatives and not compartmental, and that there would be considerable overlap among these levels while conducting the research, both design and implementation aspects. Future research could explore how the Gandhian approach driven by altruism influences the management of PPPs. Further research can also explore the processual aspects of evolution of successful as well as unsuccessful PPPs so as to comprehend the dynamics of relationships involved in nurturing the partnership.

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