

Summer Training Report

By

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“No one who achieves success does so without acknowledging the help of others. The wise and confident acknowledge this help with gratitude”.

-Alfred North Whitehead

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Part 1- Work from Home Report(Assigned by Faculty)

Telemedicine: Causing Paradigm Shift in Healthcare

INTRODUCTION

According to the WHO definition, Telemedicine can be defined as the delivery of healthcare services with a blend of Information and Communication Technology(ICT)-connecting patients and service providers who are geographically in different locations, to exchange patient data for diagnosis, treatment and prevention of diseases and injuries. India being a developing economy, along with its huge population is a fit candidate for telemedicine. Equal access to quality healthcare at affordable cost is the goal that the Indian Government is committed to providing, and digital health is a key enabler and a prerequisite for the overall transformation of the health care system. Integrating telemedicine into health systems will therefore minimize inequity and access barriers. The Digital Health Policy of India also advocates the use of digital tools and payment methods to improve the efficiency and performance of healthcare systems. Emphasis is placed on the use of telemedicine services in grassroots- the health centers to strengthen the system and overcome the rural-urban divide that prevails in the Indian context for timely and best care.

Many major countries of the world were in a lockdown period, to contain the spread of the novel Coronavirus disease(Covid-19 pandemic) while allowing only essential activities to prevail. On 24th March 2020, the Government of India under PM Narendra Modi, ordered a nationwide lockdown for 21 days, which was further extended. During this period, there were restrictions imposed on mobility of patients, and all OPDs were shut as well, this particularly made management of patients with chronic diseases extremely difficult. The Ministry of Health and Family Welfare, along with NITI Aayog, had issued official guidelines for the practice of telemedicine in the country. These were aimed at enabling registered physicians to consult remotely in the Supersession of the Indian Medical Council. The guidelines set out information on different aspects of telemedicine technology platforms and tools available to medical practitioners and how to integrate these technologies in order to provide healthcare. It also focused on how voice, data , images and information technology and

transmission should be used in conjunction with other clinical standards, protocols, policies and procedures for providing care. The document referred to the rationalization of thinking and the use of telemedicine where it is clinically appropriate, safe, effective and adds a valuable modality to support patient care. Like any other technology, telemedicine technology can be abused. There are risks, drawbacks and limitations that can be mitigated through proper training, enforcement of standards, protocols and guidelines. This document was the need-of-the-hour because there was concern about the practice of telemedicine and the lack of clear guidelines created considerable ambiguity.

LITERATURE REVIEW

1. Mishra et al(2009) – The article is a work of research in the field of Telemedicine, by professors of Sanjay Gandhi Post Graduate Institute of Medical Science, Lucknow. It discusses the global telemedicine projects India is a part of, to help other countries like Africa in need through its telemedicine initiatives. The future perspectives are also focused through research and development.
2. Ganpathy (2014) – The article introduces the context of Telemedicine, Contribution of the Apollo group and the author's personal experience during the development phase of telemedicine with Apollo Hospital Group, since the inception. The National telemedicine scenario is discussed, and the challenges that need overcoming in the Indian context-technical issues, social and ethical issues are outlined.
3. Mathur et al(2017) – The paper discusses in detail about the Indian scenario of Telemedicine, its validation in the healthcare system, the existing framework of telemedicine centers and the regional distribution. The role of some private players is introduced, and importance of Public-Private Partnership is highlighted in this context. Review also covers the impact of successful implementation, and improved health outcomes through the initiatives.
4. Ministry of Health and Family Welfare(2020) – The regulatory body in super-session to Indian Medical Council, issued first official document regarding standard protocols and practices to be followed by doctors for proper patient management in the wake of the pandemic.
5. Ghosh et al(2020) – The aim of the study is to highlight the importance of telemedicine in managing chronic conditions like Diabetes in patients, amid lockdown. It is specially proven a boon, when patient-doctor mobility was at halt. Clear guidelines by the government also aided. Overall feasibility assessment is provided.

OBJECTIVES

The main aim of this project was to scrutinize and discuss the existing telemedicine framework in the Indian healthcare delivery because of its intriguing feature of revolutionizing healthcare. It has caused a paradigm shift from the traditional practices and has embraced novel Information and Communication Technologies (ICT), to enable digital health for all, and the overall transformation of the health system. The focus is also to look upon the dawn of telemedicine-The Post-Covid era will have to follow strict social distancing norms, so telemedicine will be the new normal. People will have to adapt to this change in order to continue living healthy lives.

METHODOLOGY

The report is based on secondary data. Information was collected from search engines- Google Scholar and PubMed. In addition, various websites were also searched like- MOH&FW, WHO, ISRO, Apollo Hospital group, School of telemedicine and Biomedical Informatics under SGPGIMS- website. Other internet sources- economic times, foxnews, World Economic Forum and student papers.

FINDINGS AND DISCUSSION

Telemedicine utilizes the state of the art- electronics, ICT(Information and Communication Technology) and associated applications in the area of healthcare delivery and is also used in providing education to patients and healthcare professionals. Telemedicine applications are categorized in two broad categories-

1. **STORE AND FORWARD or Asynchronous type-** It is a method by which healthcare providers share patient medical information like lab reports, imaging studies etc. with a physician, radiologist or specialist at another location. This method is an efficient way for patients, primary care providers and specialists to collaborate because they can all review the information when it is convenient for them, even across long distances and in different time zones. Store and forward is particularly popular with certain specialties including dermatology, ophthalmology, and radiology.
2. **REAL TIME or Synchronous type-** During a real time telemedicine encounter, patients and providers use video conferencing software to hear and see each other. This type is more popular for primary care, urgent care, follow-up visits, and the management of medications and chronic diseases.

HISTORY OF TELEMEDICINE IN INDIA

The activities related to telemedicine started in 1999 in India, though the government recognized its potential in the next year. The initiative was proposed by the Government of India, with the participation of various State Governments and the collaboration of organizations such as the Department of Information Technology (DIT), the Indian Space Research Organization (ISRO) and a number of leading national technical and medical institutions.

Telemedicine and its regional distribution

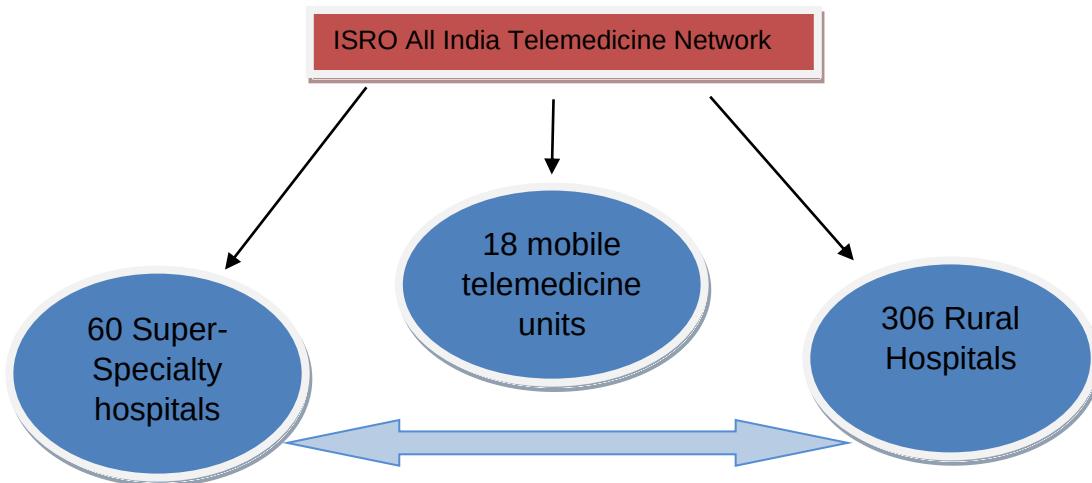
DIT as the main facilitator of telemedicine initiatives, rolled out projects in different states of the country for the overall development of technology and standardization of telemedicine. As a result of it, there are more than 75 nodal centers nationwide to support research and development. The following telemedicine pilot projects were successful- in West Bengal for

diagnosis and monitoring of tropical diseases, the Oncology Network in Tamil Nadu and Kerala, the network for specialty healthcare access in rural areas in Punjab and in the hilly regions of Himachal Pradesh and the North-East sister states. DIT also setup links among three premier Institutions in India, which are then connected to state level hospitals for providing care-

- Sanjay Gandhi Post Graduate Institute for Medical Science, Lucknow
- All India Institute of Medical Sciences, New Delhi
- Post Graduate Institute of Medical Education and Research, Chandigarh

Contribution by ISRO in the development of telemedicine

ISRO is mainly to credit for setting up all the technological expertise for the creation of telemedicine network in India. ISRO's Satellite based Telemedicine Network through the Indian Satellite System (INSAT), was started in 2001 under GRAMSAT(rural satellite) program to extend technological support to provide quality healthcare across poor population. It now includes a total of 384 hospitals- comprising of 60 super-specialty hospitals connected to 306 remote/rural medical college hospitals and 18 mobile telemedicine units. The successful states to implement this are Tripura, Nagaland, Karnataka, Andaman Nicobar Islands and Jammu-Kashmir. In addition, the ISRO Telemedicine Program has been improvised for the benefit of medical practitioners / doctors through the CME initiative (Continuing Medical Education) in the network. The lecture, which originates from a single node, can be received by all 'remote student nodes' which have been re-transmitted to the network, thus creating a 'virtual classroom.' This facility has helped hospitals and medical institutions share their experience and best practice with each other.



OTHER CONTRIBUTING PARTNERS

Ministry of Health and Family Welfare(MOH&FW)

MOH&FW is promoting e-health or digital health by using ICT, in the direction of 'reaching services to citizens' and bring significant improvements in the public healthcare delivery. The National Medical College Network(NMCN) has been implemented to link all medical colleges in the country. The primary objective is to create a coherent environment for medical education in order to meet growing demands.

E-classrooms at 50 medical colleges are being set up to facilitate distance learning and education by using high-definition video conferencing systems based on audio and visual control systems. The facilities under this project include a virtual classroom, sharing of lectures and educational content, sharing skills and open online courses, etc. It will support researchers and students from varied backgrounds and locations to work remotely while staying connected.

State Telemedicine Network (STN)

These initiatives have been approved with the vision of providing telemedicine services to remote areas by upgrading existing state health care facilities. The Member States / Union Territories are supported by the National Health Mission (NHM) under the Program Implementation Plan (PIP). Ten States have received financial support to strengthen national telemedicine initiatives under the STN. A sustainable operating model will be developed by state governments to create a reliable, ubiquitous and high-speed network backbone.

Satcom based Telemedicine nodes at Pilgrim places

In line with the vision of PM Modi, in collaboration with the Department of Space, the establishment of new telemedicine nodes at pilgrimage sites was envisaged using Space Technology Tools for telemedicine facilities between identified remote health facilities and specialty hospitals. The sites currently active are:-

- Vishvanath Temple in Kashi, Varanasi, UP
- Vindhyachal, in Shakti Peeth, Mirzapur, UP
- Sheshnag, Amarnath Pilgrimage in J&K

- Pampa Hospital, Ayyapa Temple at Sabarimala in Kerala.

Currently, the identified patient nodes are proposed to be interlinked with specialist nodes in their respective States. However, tele-consultation can be obtained from any of the super-specialty nodes set-up across the country such as AIIMS-New Delhi, SGPGI-Lucknow, PGIMER-Chandigarh, JIPMER-Puducherry.

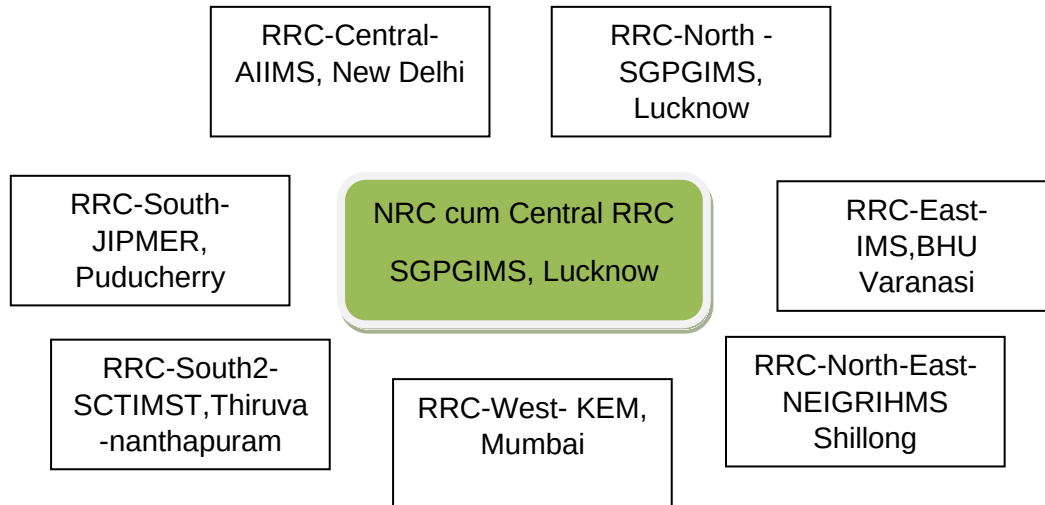
JIPMER-BIMSTEC Strengthening Regional Healthcare

The aim of this telemedicine network is to improve regional cooperation in the field of healthcare by strengthening telemedicine-based patient care services and sharing of medical knowledge among its member countries namely- Bangladesh, Bhutan, India, Nepal, Sri Lanka, Thailand, and Myanmar.

TELE-EVIDENCE is a method by which doctors can testify, without being physically present at a court of law, using a video-conferencing facility. Since 2014, this setup has been operational at PGIMER, Chandigarh.

National Resource Centre for Telemedicine

SGPGI, Lucknow functions as the Central Hub / National Resource Center for the development of a national network linking all Government Medical Colleges, Universities, Central / State and Autonomous Medical Institutes under a centrally sponsored NMCN system. The facilities set up under this center are being used to meet tele-consultation and e-learning for the professional development of students, teachers and healthcare professionals across the country with NKN high-speed fiber backbone. The NRC network with 7 regional hubs, called the Regional Resource Centers(RRC) are located at different regions of the country. The following diagram shows different RRC's in India:-



The following facilities have been created at these centres-

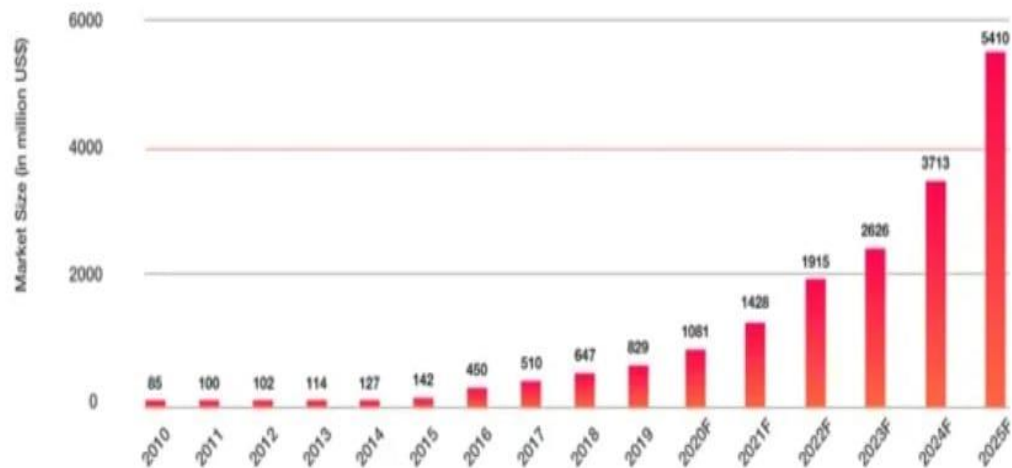
1. State-of-the-art Digital Lecture Theatre with integrated 3D projection system.
2. Tele-Medicine Video Collaborative environment which is sort of a virtual tumor board for cancer patient management.
3. Centralized Multi-point Control Units integrated with gatekeeper facilities.
4. Centralized webcasting/streaming solutions.

Involvement of private entities in Telemedicine in India

The unprecedented Covid outbreak, has created utter challenges on traditional healthcare systems. Telemedicine start-ups such as Practo, DocPrime, mFine, CallHealth and Lybrate were operating under a regulatory grey area. The clarity in the regulations around telemedicine will not only help these start-ups improving access to healthcare among rural class.

Telemedicine Market Is Expected To Cross US\$5.5 Billion by 2025 In India

Telemedicine attributes highest market share in India health tech market



The current telemedicine guidelines in India provides a more comprehensive framework and scope for high investment from the private sector in this field.

Practo Leading The Healthtech Funding Space In India During 2014-2019

Startup Name	Foundation City	Year	Founders	Total Funding During 2014-2019 (in Mn US\$)	Funding Stage	Investors
	Bengaluru	2008	Shashank Nd, Abhinav Lal	195	Late Stage (Series E)	Tencent, Ru-Net, Rsi Fund, Thrive Capital, Trifecta Capital
	Delhi NCR	2018	Ashish Gupta	50	Seed Stage	Policybazaar Group
	Bengaluru	2017	Ashutosh Lawania, Prasad Kompalli	27.8	Growth Stage (Series B)	SBI Holdings, SBI Ven Capital, Beenext, Stellaris Venture Partners, Prime Venture Partners, Alteria Capital
	Hyderabad	2013	Shailendra Kumar Komatreddy, Sandhya Raju, Hari Thalapalli	14	Growth Stage (Series B)	The Times Group, Sachin Tendulkar, PV Sindhu, Pallela Gopichand
	Delhi NCR	2013	Saurabh Arora	11.43	Growth Stage (Series A)	Nexus-Venture-Partners, Tiger Global Management, Ratan Tata, Nexus Venture Partners

India's healthcare industry is primarily driven by start-up players now rather than large cooperation. Tracing the telemedicine history, Apollo Hospital was the first private player in telemedicine under the guidance of Dr. Ganpathy. The Apollo Telemedicine Networking Foundation (ATNF) was established as a non-profit organization and part of the Apollo Hospitals Group. Apollo Hospital has collaborated with ISRO to set up India's first Rural Telemedicine Center in Aragonda, Andhra Pradesh. Since then, ATNF has emerged and has grown to become India's largest provider of telemedicine. With more than 150 telemedicine centers around the globe, ATNF works with multiple entities, such as the central and state governments, medical institutions, through private and public sector partnerships—both domestically and internationally. It offers customized solutions addressing

telemedicine to support for primary, secondary and tertiary levels of care. 'Medintegra Web', the proprietary telemedicine application, supports the platform to carry out telemedicine consultation. Apollo Hospitals provide the medical support by rendering quality healthcare through its key hospitals in all the metro cities in India.

'Narayana Hrudayalaya,' now known as Narayana Health, is also one of the best-known examples of delivering innovative care models that reduce costs , improve quality and increase access to services. UK trained cardiac surgeon Dr. Devi Prasad Shetty MD, who served as Mother Teresa's personal physician after operating on her heart attack, founded Narayana Health in 2001 in Bangalore. The potential of telemedicine has also been recognized and incorporated by him in the health model. Narayana Health was named one of the 50 most innovative companies in the world by the popular online magazine 'Fast Company' in 2012. They also collaborated with ISRO on their first telemedicine pilot project- the establishment of a cardiac care unit in the Chamarajanagar District Hospital, Karnataka. It also received funding from the World Bank with additional support from the Karnataka Health System Development Project. They have established 130 telemedicine centres all over India. Recently, NH also teamed up with CISCO to deliver specialty healthcare services in remote areas. To overcome the problem of malware and cyberattacks-viruses that tend to attack medical data, CISCO and NH have signed a Memorandum of Understanding to develop a medical grade network that will enable hospitals to provide remote diagnostic services in oncology, neurology, cardiology and nephrology across India. This platform is aiming to decrease complexity and enabling healthcare providers to serve patients almost everywhere. The encrypted, secure platform also ensures the privacy of patient records, and the service is stored on the cloud. NH has a strong strategy in place and their telemedicine solution has evolved tremendously.

Future Challenge

There is a need for proper awareness creation about telemedicine, it has to be marketed efficiently. Many parts of rural India still lack in basic infrastructure, to which government is continuously working. Future a more clear and apt regulation needs to be provided for overcoming operational difficulties. Acceptance of these technologies both by doctors and patients will be a challenge.

CONCLUSION

Technology is crucial to India's digital ambition. The rapidly evolving need for higher Internet speed, rapid urbanization plans for cities , industrial automation, connected devices, etc., have made 5G inevitable. Covid has caused an economic slowdown, but the post-covid times will be crucial to monitor.

As uncertainty prevails, we can and have to surely rely on technology for our healthcare needs. It is a potent solution for a wide range of problems. It is surely an Entrepreneurial opportunity right now, services like tele-education, tele-health, tele-home healthcare are already flourishing. We will till have to figure out the technological disadvantages like Data-security issues, privacy concerns, digital media manipulation, over-reliance on gadgets and job-insecurity. And we also have to overcome the problem of negligence from doctors and patients. More Behavior Change Communication is needed now to adapt to the post-covid phase and restoring normalcy.

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Part 2- Online Course Report

Course title- Entrepreneurship in Emerging Economies

Course Description- This is an Audit course which is done on the e-learning platform- Edx provided by Harvard University, and the effort level is 24 hours. The lead faculty on this course is Tarun Khanna, who is a Professor at Harvard Business School. He graduated from Princeton University with a degree in Engineering and enrolled in the PHD program from Harvard. He joined Harvard as a faculty in 1993 and has been engaged in courses on Corporate strategy, MBA in International Business and PHD programs. He also acts as the Faculty Chair for HBS activities in India and South Asia-where he has worked with many companies and investors to develop innovative solutions for the problems faced by these emerging markets. Some additional contributors to the course are as follows- Sue J. Goldie(Professor of Public Health at the Harvard T.H Chan School of Public Health),Michael Chu(Senior Lecturer of HBS),Prithwiraj Choudhury(Assistant Professor),Dr. Salchit Balsari(Director of the Global Emergency Medical Program at Weill Cornell Medical College/ Presbyterian Hospital) and Sarah Lockwood(Doctoral candidate in African studies with a primary field in government).

Course Objective- The main objective of this course is to gain familiarity with several novel entrepreneurial engagements around the world that have created enormous productive social, political and economic change in diverse emerging economies. While the allure of solving problems is enticing, the challenges associated with embarking on an entrepreneurial adventure can be daunting. This course explores these challenges both generally and in the specific institution context within which the problem of interest is situated. Emerging economies face a different set of challenges than advanced economies. One idea that we return to frequently in this course is Professor Khanna's concept of "institutional voids". An institutional void is a term used to refer to an absence of intermediaries between buyers and sellers in a given market. If a country's infrastructure is intact (which is often in developed nations), it is relatively simple for a buyer to meet the seller and obtain a desired good or service. However, in emerging economies, a transaction

between a buyer and seller is not always straightforward. Lack of developed infrastructure and institutions, or other requirements such as telecommunication services, intellectual property rights hinder efficient business operations. We are provided with many examples throughout the course how entrepreneurs recognize these institutional voids and make these a site for entrepreneurial intervention. Without an understanding of what institutional voids are and how to overcome them, a well-meaning entrepreneurial intervention in a given country might be fruitless.

The course also mainly highlights how individual entrepreneurs have managed to circumvent the limitations of the environment in which they operate to create an impact-at-scale. We are also presented with many examples as case studies in each chapter to gain better insights such as Entrepreneurship in Alibaba and Taobao villages, business models of The Narayana Model of Tertiary Care, and Farmacias Similares, Branding and the stories of entrepreneurial interventions of AMUL dairy cooperative, the Maha Kumbh Mela are to name a few. The course uses Healthcare as a key focus for understanding entrepreneurial engagement.

COURSE CONTENTS

Chapter 1- Characterizing the Context of Emerging Markets

- Introducing institutional voids and recognizing them as opportunities
- The challenge of lack of personnel training and entrepreneurial interventions to tackle them, examples discussed- NSDC and Aspiring Minds
- Combatting corruption
- Innovation in transportation- example of Ambulatory services by Shaffi Mather discussed
- Case Study- Taobao villages(Rise of e-commerce in rural China) and Alibaba Group

Chapter 2- Achieving Impact at Scale through Entrepreneurship

- Detailed Case discussed- NARAYANA Model of tertiary care(business model, charity and sustainable healthcare interventions, evolution and transferability of the model)

- Small Caselet- Farmacias Similares business model(provided generic medicines at cheaper rates to citizens of Mexico along with access to primary healthcare), its key success factors and the social impact of a commercial

Chapter 3- Branding and the stories of Entrepreneurial Ventures

- Introduction to health aspects of food security(problems of under-nutrition)
- Case Study- AMUL dairy cooperative(its origin, reasons of success, branding and mechanics of AMUL)
- Small caselet of BRAC's efforts in creating a poultry industry in Bangladesh
- Another case study on Dia-Dia Grocery store business model(starting a business in emerging market, economics of Dia-Dia, problems faced-lack of capital and political unrest)

Chapter 4- Creativity and Innovation as drivers of entrepreneurship

- Innovation and legal constraints- introduction to Intellectual Property Rights, and Patent System- the problem of Biopiracy
- Case Study- Cipla-how a company can be seen as a savior or a thief?
- Case of CSIR and bureaucratic entrepreneurship-Strategies

Chapter 5- Platforms, Partnerships and Entrepreneurship

- Overview of population dynamics
- Detailed Case Study on the Maha Kumbh Mela-(background information, introduction, experiencing the festival, overview of personal safety and security, public private partnerships and urbanism in the Kumbh)
- Lessons from the Kumbh Experience

Learning Methodology Used

The course was undertaken with the help of video lectures that were pre-recorded, and case studies were discussed simultaneously. After introducing a new case, we were asked certain questions and participants discussed those in the discussion forum. Additional reading material links were also attached for our reference.

Key Learnings

The course also focused on the global health framework, an innovative way to understand the intersection of social, political, and biological factors that shape healthcare and contribute to the social context of a given market. The unique institutional context of a market determines the ways in which an entrepreneur can intervene and to a greater extent, also determines the success or failure of a particular strategy. Within a given market, there can be a number of appropriate interventions-

- REPLICATE or ADAPT an existing business model in that market.
- COLLABORATE with domestic partners
- NAVIGATE around the market's voids actively and try to fill them.

It takes substantial amount of work, expertise and time for gaps in infrastructure and intermediaries to be recognized and addressed. Spotting institutional voids thus provides a crucial jumping off point for assessing business opportunities, market conditions and risks.

Narayana Health Model

Narayana Health is a multi-specialty hospital chain located in the city of Bengaluru , India. It is known as a low-cost and high-quality Indian health service provider. The unique business model of Narayana Health has become a case study at Harvard Business School. It is also renowned for being one of the largest telemedicine networks in the world. Dr. Devi Prasad Shetty is the Chairman and Founder of Narayana Health, his vision is to provide high quality affordable tertiary care for India's poor population.

Reasons for Success of the model

- The hallmark of this model is **LARGE SCALE**, and it matters because you can take any fixed cost such as cost of equipment, hospital facilities, diagnostic equipment etc. and amortize it over a large volume and this reduces the per unit cost of each surgery performed. Opportunities for negotiation from suppliers because of the large scale also facilitates further.
- **Economies of Scale** can be defined as the cost advantage that arises with increased output of a product.

Quantity produced is inversely proportional to Fixed cost, that means greater the quantity produced lesser is the per unit fixed cost. Economies of scale may also reduce variable costs per unit because of operational efficiencies.

NH's Financial Model

A Stochastic model(involving probability, random stochastic optimization model) is adapted- this optimization is done so that Inventory of cash is always sufficient, that you don't get caught with no cash. And also, you don't want too much cash because too much cash means that you're not treating enough poor patients to fulfil your mission. It's a delicate balancing act that the hospital has to figure out.

- The patient comes in
- Triage process
- They are asked a simple disarming question- How much can you pay?
- Whatever might be the answer
- They have option of paying something that is the breakeven price of the particular surgery, they can also pay the list price of the surgery
- A "Karuna Hrudaya" package is also offered- which allows them to pay below the breakeven cost of the surgery-just to contribute something whatever is the patient's capacity
- Even if they can't pay that surgery is done for free.

Evolution of this model

To expand this model, Narayana Health did two things-

One was to take the cardiac care skill driven model and apply it to other therapeutic areas such as orthopedics, oncology, obstetrics etc.

This was done right in Bangalore to create a "Health City of all sorts".

Second was to take the basic idea and try to see how they can share that with the rest of the world, with other countries which are in dire needs. Expansion project experiments were carried out in Mexico, Latin America, and Cayman Islands.

Farmacias Similares

With the aim of providing affordable healthcare services to Mexican citizens, Farmacias Similares is a for-profit model seeking to address major weaknesses of the Mexican public health system. It introduced generic drugs in the market for first time and provided access to generic medicines at 30% and up to 75% lower price than in other pharmacies in Mexico. The rates were cheaper along with the access to a primary care physician at the store.

The reasons contributed to its success were-

- Access to doctors without long wait
- Convenient locations
- Focused business model
- Politically neutral environment
- Super value proposition (better alternative than public health and was also available at a price point that fit the cash flow of the intended market).

BRANDING STORY OF AMUL

India is the biggest dairy producing and consuming country in the world and Amul is the biggest dairy cooperative in the world today. Amul has managed to aggregate farmers into a system that it daily produces fabulous high-quality milk at affordable prices. It addresses one of the most elemental societal health issues- getting clean, safe milk from one place.

Varghese Kurien, the founder of Amul is called the Father of white revolution, he has managed to modernize dairy cooperative with Research and Development as its powerhouse. Amul aggregates milk from farmers(decentralized) to abandon large mechanized dairy farms that are common in the West.

Branding- Anand Milk Union Limited-AMUL's credibility was also enhanced by getting its incredibly innovative advertising campaign. Amul is short for Amulya meaning indispensable, priceless. Marketeers also came up with "Utterly Butterly Amul". An ad agency came up with a cartoon girl-muppet, and every Monday, all over India the hoardings have a new ad- commenting on some current events that has intelligent satire. This still happens and it is also the most successful, and longest running billboard campaign.

PATENT SYSTEM

A patent is basically a right that is conferred on you i.e. the innovator- the inventor of something, to have monopoly rights on the things that are produced from your idea for a certain period of time and the notion is while you have the monopoly rights nobody else is allowed to use your idea without your sanction. You can sell the idea in various forms and earn money, get recognition which should compensate you adequately for the effort of coming up with your idea. Patent life is 15-17 years and when the patent expires, then the innovation becomes freely available to society completely.

North/South Model

The central idea is that the developed world, i.e. the West is the innovator and countries in the developing parts of the world i.e. the emerging markets are more imitators, and the central reason for this is the IP Rights, protection of the IP granted in the West- called the NORTH in this case is stronger. And this manifests in terms of longer pattern lengths initially, but essentially more in terms of enforcement of law. And the same protection to IP rights is weaker in the SOUTH i.e. the emerging markets. And as the result of this, most firms innovate in their R&D centres in the North, and then the Entrepreneurs and companies in the South would imitate those innovations through REVERSE ENGINEERING. This has been the dominant paradigm for decades.

CIPLA- a generic pharmaceutical company is the example of how a company can be seen as a savior or a thief. Dr. Yusuf Hamied built the company from scratch, an Indian who lives in different parts of the world, he is a PHD Chemist and something of a swashbuckling Entrepreneur who, on depending who you ask, is either a paragon or a pirate.

Global Pharma hates him because they feel he is stealing their ideas. And patients, poor people in the world. Patients with AIDS and other diseases who can't afford medication at the prices the West provides, they think of him as a Savior and he's a paragon of virtues. Cipla is a multi- million-dollar company and it has used the Indian patent system to reverse engineer and produce at a very large scale-many medications for HIV, the so-called cocktail of drugs that is now used to treat a disease which was once considered deadly.

Maha Kumbh Mela

Mass gatherings such as the Kumbh Mela generate specific health challenges that are similar to those faced during the rapid urbanization, but also provide opportunities for entrepreneurial interventions. Professor Khanna described a number of challenges related to security and infrastructure at the Kumbh Mela.

Reason for Harvard's Study on Kumbh

Only three types of literature existed before this study-

- One by academic scholars
- Two by bureaucrats who administered Kumbh
- Third by photographers

But there was no study that systematically looked at this open system. This was a wonderful Inter-disciplinary project, where the researchers came to the festival, from diverse fields- Public Health, Architecture and Design, Business Administration from Harvard University to study various aspects in 2013.

14 hospitals had been setup in the 14 districts, and the public health researchers wanted to know how they were going to spot the epidemics at the Mela, in the winter season between the extreme density of the people. They were there to examine the health infrastructure. Free Healthcare was offered to all and had round the clock doctors and nurses. On busy days, physicians would see as many as 600 patients in an 8-hour shift, during which patient record was not maintained properly because of the large volume of people. So, the first intervention Harvard scientists offered was the technology to access patient information easily on tablets for syndromic surveillance. They also recruited 20 medical interns across India, to help the physicians enter data efficiently. There were rented iPads at the 14 clinics and the commercially available software was downloaded on it with customized tools to meet the requirements. It was called M-counter, a system which has worked well. The data was synced from iPads to the cloud server through 2g or 3g internet from the sim-card and was updated on a cloud server for visualization in close to real time. The National Disaster Management Authority also supported the project and the physicians were also excited, where this kind of interventions made a substantial difference to people's lives.