
IBS Center for Management Research

Innovations in the Healthcare Services Industry in India

*This case was written by **Suchitra Jampani**, under the direction of **Sanjib Dutta**, IBS Center for Management Research. It was compiled from published sources, and is intended to be used as a basis for class discussion rather than to illustrate either effective or ineffective handling of a management situation.*

© 2004, IBS Center for Management Research. All rights reserved.

To order copies, call +91-08417-236667/68 or write to IBS Center for Management Research (ICMR), IFHE Campus, Donthanapally, Sankarapally Road, Hyderabad 501 504, Andhra Pradesh, India or email: info@icmrindia.org

www.icmrindia.org

Innovations in the Healthcare Services Industry in India

“Give people a new experience, one that deeply changes their lives, make it affordable, and eventually you change the whole world. And your customers become your marketers.”

-Dr. Govindappa Venkataswamy, founder of Aravind Eye Hospitals¹.

“We are looking to develop realistic models to balance the cost of creation and the ability to pay. The agenda is to try and bring quality healthcare to the masses at a minimum price and yet help the hospitals to run a viable business”.

- Dr Naresh Trehan, Chairman of the Confederation of Indian Industry's (CII) Committee on Healthcare for 2003-04.²

“Apollo and other private hospitals have tried to bring in the best health facilities to India. Now, most of these hospitals are in the metros. We want to take it to the smaller towns and villages. Similarly, in some of the other countries especially in the Afro-Asian region, there is a great need for healthcare facilities”.

- Pratap Reddy, Chairman of Apollo Hospitals, in an interview with Rediff.³

INTRODUCTION

In 2003, a CII and McKinsey study projected that India's healthcare market could touch Rs.3,200 million by 2012 from the existing Rs.1,030 million. It also predicted that India had a great future as a major destination for medical tourism. India is already a preferred healthcare destination for neighboring countries due to the low cost and high quality treatment available here. With the arrival of tele-medicine in 1999, several large healthcare facilities in India have been linked up with healthcare facilities in the neighboring countries and the rest of Asia. Tele-medicine has enabled international patients to obtain specialized care in from India.

In the recent past, there have been several innovations in the healthcare services industry in India, giving patients a new experience of healthcare. The Amrita Institute of Medical Sciences' fully digital, computerized and networked facility enabled it to offer tele-medicine services such as tele-consultation, fetal tele-medicine and tele-surgery. Aravind Eye hospitals' Internet kiosks in remote rural areas enabled poor villagers to consult top eye physicians online. Apollo Hospitals covered the entire gamut of healthcare services, from primary, secondary and tertiary care to diagnostic services and pharmacies. The innovations in products and services have made its hospitals a one stop location for people's healthcare needs. The hub and spoke model was another innovation in the diagnostic centers and pathology laboratories segment. All these innovations have given patients better service.

¹ Sulekha.com

² P.T. Jyothi Datta, 'Scope for major corporate role in primary healthcare', July 25, 2003, www.blonnet.com

³ Shobha Warriar, 'We will make India the global healthcare destination: Reddy' September 30, 2003, www.rediff.com

EVOLUTION OF THE HEALTHCARE SERVICES INDUSTRY IN INDIA

In India, healthcare is delivered through both the public healthcare system and the private sector. The public healthcare system consists of healthcare facilities run by the central and state governments, which provide services free of cost or at subsidized rates to low-income families in rural and urban areas. The government funds allocated to healthcare sector have always been low in relation to the population of the country, and in 2003 were as low as 0.9 per cent of the GDP. In the private sector healthcare industry, healthcare facilities are owned and run by for-profit companies and non-profit or charitable organizations. Healthcare facilities run by charitable organizations also provided services at subsidized rates or free of cost depending on the income of the patient or the patient's family.

Initially, the government imposed high custom duties on imported medical equipment making it difficult for private individuals to set up hospitals that provided specialized care using sophisticated equipment. As a result, there were very few privately run large hospitals but there were many small private practitioners who provided primary and secondary care.⁴ Another, limitation faced by the private sector was low penetration of medical insurance which meant that almost everyone paid out of their pocket. Therefore, many could not afford to go to private hospitals, as the fees were much higher than the government run hospitals. Gradually, with the rising population and number of people suffering from diseases that required specialized care, together with the limited government spending on healthcare, the quality of services at government run hospitals suffered. The existing government facilities were simply not enough to cater to the burgeoning population, whether it was primary, secondary or tertiary care⁵.

The private sector investment in the healthcare industry really took off in the 1990s after the liberalization of the Indian economy. The number of privately run large hospitals and non-profit and charitable hospitals began to increase. The non-profit hospitals catered to low-income families that could not afford to go to corporate hospitals even though they felt that government hospitals were not providing the best care.

Even though insurance industry was opened up to private sector in 2000, the penetration of medical insurance still remained very low. In 2003, it was estimated that only 10 to 15 per cent of the Indian population were covered whether it was private health insurance or government schemes.

The innovations whether in business models, in marketing & promotion or in the use of technology, have created unique experiences for patients. Facilities such as Aravind Eye hospitals have impressed people worldwide, and have been the subject of study, with a view to replicating their success in other countries. India has become a major destination for quality healthcare for neighboring countries such as Pakistan, Nepal and Bangladesh. In 2002, the healthcare industry in India was valued at Rs.1,000 billion, directly employing 4 million Indians. According to the Times Healthcare report 2002, the industry grew at the rate of 13 per cent annually in the 10 years upto 2002, and is currently growing at 17 per cent annually. According to the joint report of CII and Mckinsey, the healthcare industry in India was valued at Rs.1,030 billion in 2003.

⁴ Primary care is care provided by general physician at clinic. Minor ailments are treated and preventive care such as vaccinations is provided. Secondary care is provided by physicians who have specialized in various areas such as gynaecology, internal medicine, general surgery etc.

⁵ Tertiary care is highly specialized and is provided by specialists like ENT doctors, cardiac surgeons, neurologists etc. This type of care includes emergency and trauma care, organ transplants, neonatal care, etc.

THE AMRITA INSTITUTE OF MEDICAL SCIENCES

Amrita Institute of Medical Sciences (AIMS), a super-specialty facility opened in May 1998, was managed by the Mata Amritanandamayi Math (MAM). MAM was a public charitable trust founded to spread Mata Amritanandamayi Devi's⁶ message of spirituality, universal love and selfless service to humanity. AIMS provided primary, secondary and tertiary care and diagnostic services⁷. Its services were provided free of cost to the poor, at highly subsidized rates to people with limited means, and at reasonable rates to those who could afford to pay. MAM also ran a research facility, a medical college, a nursing college, a dental college and a pharmacy school attached to AIMS. As revealed by its mission statement, AIMS wanted not only to provide quality healthcare, but also to improve the well being of the community through quality programs of preventive medicine, medical education, and research.

AIMS was located on a 30-acre site in Cochin, Kerala. Its infrastructure included 22 operating theaters, 135 intensive care beds, a total of 800 beds, and various departments and specialty services (Refer to Exhibit I). The Pathology and Laboratory Medicine center at AIMS had comprehensive testing capabilities offering a wide variety of diagnostic tests. The laboratory used sophisticated testing equipment which could be interfaced with a computer information system to store results directly. The center used a system called Lab Information System (LIS) to store test results and reports, enabling doctors to access them from computers located throughout the hospital. AIMS also had a state-of-the-art Medical Imaging Center (radiology department) which used digital equipment for all its imaging. The center did not use film, but stored all radiology images in a computer image archive which were accessible by doctors from computers all over the hospital. This system is called Radiology Information system (RIS). Both LIS and RIS were integrated with the Hospital Information system (HIS), a patient information management system that managed all patient information and hospital transactions from registration to discharge. Apart from HIS, LIS and RIS, AIMS also used Web Source, through which doctors could check the status of patients in the ICUs and CCUs from computers in their offices.

Being a fully digital, computerized and networked facility enabled AIMS to offer tele-medicine services such as tele-consultation, fetal tele-medicine and tele-surgery (Refer Exhibit II). Through tele-consultation, AIMS provided specialist diagnosis, second opinions, treatment recommendation and post treatment advice based on medical data and test results. During tele-consultation, specialists could provide expert advice using transmitted scanned images like MRI, CT-scan, X-Ray, ultrasound, doppler, echo, holter, angiographies, pathological slides, blood, urine test results, etc. For fetal tele-medicine AIMS provided expert advice to high-risk pregnant women on viewing their ultrasound images. AIMS also employed fetal echocardiography for early diagnosis of heart problems and to recommend proper treatment. In tele-surgery, surgeons at AIMS could guide other surgeons through a surgical procedure, using a satellite video connection. AIMS had emerged as a major tertiary care referral facility in India and was connected to 20 tele-medicine centers. It was also connected to hospitals in the Union territory of Lakshadweep and Andaman & Nicobar islands through a satellite launched by the Indian Space Research Organization (ISRO).

On the request of the Kerala government, AIMS set up an emergency care center at Pampa river near the Sabarimala temple of Lord Ayyappa. The facility would be open for about two and half months during the festival when millions of people travel to the temple to pay homage to Lord Ayyappa. To reach the temple, pilgrims need to travel barefoot through the jungle in the Sahyadri

⁶ Mata Amritanandamayi Devi was born in a fishing village in Kerala in 1953. A devotee of Lord Krishna, she believed that her purpose in life was to improve peoples' lives whether they were rich or poor, and whatever their religion, caste or creed. Her teachings attracted several followers, and the MAM was set up 1998.

⁷ Diagnostic services include various pathology tests and radiological imaging that aid doctors in diagnosis and prognosis.

mountains in a remote area of eastern Kerala. This arduous trek results in various physical ailments especially for the elderly and persons who are not used to such strenuous activity. In one instance, in January 2003, a pilgrim came to the center because he was having breathing problems. He had a history of asthma so the doctor on duty admitted him and gave him asthma medication. After a couple of hours the doctor suspected that something was wrong when the patient still had difficulty breathing. He tapped the patient's chest and felt that there was air trapped inside the chest cavity outside the lung. He then put a small needle into the thoracic area, which released some of the trapped air. One lung had completely collapsed, creating a life-threatening condition, and needed immediate surgical intervention to insert a chest tube. But the on-duty doctor was a Paediatric Cardiologist and had never performed this surgery before. He and the Anesthetist on duty transferred the patient to the tele-medicine room and contacted the Cardiovascular Thoracic surgeon at AIMS. From the tele-medicine room at AIMS the surgeon guided the doctor through the surgical procedure via satellite video connection. The procedure was performed with local anesthesia and lasted about 20 minutes. The patient was then taken to AIMS by ambulance for stabilization and recovery.

AIMS was able to provide complete quality healthcare services to its patients as it covered all areas of specialty care through its several departments and could also consult with specialists at other hospitals through tele-medicine. The patients could receive complete care at one facility without the need to travel to other locations. What was unique about AIMS was that it not only provided complete healthcare solutions but also endeavored to provide these solutions in a patient friendly environment and in a spirit of compassion. Having access to new technology at AIMS did not translate into impersonal care. All patients and their families were treated with great care and respect. Interactions between staff and patients or patients' families were conducted in a pleasant and friendly manner to ensure that they were comfortable in the hospital environment. As AIMS was a non-profit organization, patients were not put through unnecessary treatments and tests. Amrita Seva volunteers⁸ were trained to be nursing assistants so that they could assist patients who did not have family members to attend on them. The Amrita Seva volunteers also did all the cleaning work in the hospital. According to one of the doctors at AIMS, the non-medical staff had an ethical approach to work and took great pride in their work.

ARAVIND EYE CARE SYSTEM

The Aravind Eye Care system (Aravind) comprised of Aravind Eye hospitals in Madurai, Theni, Tirunelveli, Coimbatore and Pondicherry, Aravind Postgraduate Institute of Ophthalmology, Rotary Aravind International Eye Bank, Lions Aravind Institute of Community Ophthalmology, Aurolab, Aravind Medical Research Foundation and Community Outreach programmes (Refer Exhibit III).

In the 27 years since the first Aravind Eye hospital opened,⁹ the network of hospitals has performed 1.8 million surgeries and has given eyesight to 13 million people. Though Aravind offered free service to nearly 70 percent of its patients, it was still able to maintain profit margins of 40%. The Aravind Eye hospital network was the most productive eye care organization in the world, in respect to volume of surgeries and number of patients treated. It was also the largest cataract surgery provider in the world. At Aravind, each doctor performed on an average 20 to 30

⁸ Amrita Seva volunteers are people who have volunteered to work in the projects taken up by MAM.

⁹ Dr. Govindappa Venkataswamy, fondly called Dr.V, was the founder of Aravind Eye hospitals. He was an ophthalmologist at a government hospital in Madurai, Tamil Nadu for 20 years and one of the most respected eye surgeons in India. After retiring, Dr.V founded the GOVEL Trust under which he started providing free eye care in a rented house with 11 beds, in Madurai. From one 11-bed hospital in 1976, it became a network of five hospitals with 3000 beds and an eye care system with supporting organizations and programs, by the end of 2003.

operations per day, and each surgery took about 10 to 20 minutes to perform. Not only did it perform the most number of cataract surgeries but also at the lowest cost per surgery. A cataract operation which cost \$10 at Aravind cost about \$1700 dollars in the U.S.

C K Prahalad, a leading management thinker, has studied Aravind's operations over the years. He observed that Aravind generated a 200 percent return on capital employed. "We have a good medicine school at the University of Michigan, and they are amazed by what they saw at Aravind. It is better than the best," he said, in appreciation of the functioning of Aravind.¹⁰ According to him, Aravind was a market-driving entity.¹¹ It was a market-driving entity because it served the most unserved market - the poor. The poor in India could rarely afford good eye health care, leave alone eye surgeries. For them a cataract meant blindness, and often, great suffering in their lives. They did not know that they could regain their eyesight with a 15-minute surgery.

Dr. V had to first educate his potential customers. He encouraged doctors and technicians to undertake community work regularly. As a part of this work, a representative from Aravind visited the village where the doctors intended to organize a weekend camp, and met the village heads. With their help, the representative designed a plan for conducting the camp. Once the details were finalized, doctors and technicians visited the village (sometimes they traveled days together to reach remote villages). Once they were in the camp they worked round the clock, testing people and identifying patients who need to be taken to Aravind at Madurai for surgery.

Under Dr. V's leadership, Aravind managed to provide inexpensive eye care services by pruning its costs diligently. Even operating theatres and surgery procedures were designed to enhance the productivity levels of surgeons. Dr. V kept costs low by building an efficient, high-volume, assembly-line process to perform surgeries. Every step ranging from patient screening, registration, to surgery itself, was standardized.

Two or more patients were in the operation theatre at the same time. A doctor performed the cataract operation in 10 to 20 minutes and then moved on to another patient who was ready to be operated by the time he completed operating on the first patient.¹² Nearly 70% of the work in the operation theatre was done by paramedical staff. Each surgeon at Aravind teamed up with 4 nurses in the operation theatre: two running nurses¹³ and two assisting nurses. More than the surgeon's skill, it was Aravind's system of 4 nurses for each surgeon (the same nurses to the same surgeon each time) that gave the most advantage.¹⁴ This process maximized the time a surgeon spent on surgery. As a result, doctors could concentrate only on surgery and perform a larger number of surgeries. Observed Dr Krishan Das, a surgeon at Aravind, "The fixed team makes things easy for the surgeon and the nurses. There is better understanding. Also, in a difficult situation, they know how to bail me out."¹⁵

Keeping two patients in the same operation theatre is prohibited in most US hospitals. This is done as a precautionary measure to avoid infection. However, at Aravind, doctors have never come across any problem that could be traced to infection in the operation theatre.

Four nurses helping every surgeon might appear a costly model. But the system worked. To minimize salary expenses, Dr. V recruited village girls who had completed only high school, instead of nursing diploma holders, as nurses. Before getting inducted into the hospital as nurses,

¹⁰ B Surender, 'The world's most efficient doctor', Mansworldindia.com.

¹¹ A market-driving entity creates a need that did not exist before. Market-driving organizations are guided by a vision or radical idea rather than market research.

¹² Joan Magretta, 'What management is', The free press, 2002, p 113.

¹³ A running nurse's duty is to bring fresh surgical tools from a sterilization area.

¹⁴ B Surender, 'The world's most efficient doctor', mansworldindia.com.

¹⁵ www.mansworldindia.com.

the girls went through rigorous process of selection, training, and classification.¹⁶ Aravind's nurses were in high demand as trainers. They often visited different countries such as Egypt, Indonesia, Cambodia, Maldives and Malawi to train nursing personnel.

Doctors used bamboo sticks (from bamboos grown in Dr. V's garden) in stretchers instead of steel rods to minimize costs. To further reduce costs, Dr. V set up Aurolab for the manufacture of intra-ocular lenses. In the 1980s, using IOLs was a popular practice in the US. Lens manufacturers were able to enjoy high margins by selling IOLs at \$300 to \$400 a piece. As they recorded healthy margins, they were willing to donate lenses that did not sell well in the market. But when the US health care financing administration (now the Center for Medicare & Medicaid services) put an administered pricing mechanism into place in the late 1980s, the margins of lens manufacturers went down significantly. Hence they were no longer willing to donate lenses. The new scenario forced Dr. V to think of manufacturing lenses in India.

Dr. V found a trusted ally in David Green (Green)¹⁷ who shared his dream of creating Aurolab. Green studied IOL manufacturing operations to understand how companies made the lenses. He also visited suppliers of the manufacturing equipment and technology. As the IOL industry was maturing, companies were ready to share their know-how, and sell manufacturing equipment. But it was financially not viable for a non-profit organization to manufacture IOLs as it involved a high quality manufacturing process, expensive machinery, and well-trained workforce. Green said, "So there was a lot of internal opposition, which was overcome when the money for it finally became available from donors, and we just said OK, here's the money, let's do it."¹⁸ A global consortium of voluntary organizations backed Dr. V's venture to mass-produce IOLs with the condition that Aurolab would supply IOLs to the members of the consortium at subsidized prices. Dr. V and Green readily agreed and their efforts finally bore fruit.

Aurolab started its manufacturing operations in 1992. Since then production levels have been growing by 37% per year. By the end of 2003, Aurolab was an ISO 9002 certified institution and exported IOLs to nearly 90 countries in the world. It manufactured 0.6-0.7 million IOLs every year and enjoyed a 10% market share in the world. As part of the consortium backing Aurolab, Aravind was able to source IOLs at one-eighth the international price.

Aurolab also began to manufacture ophthalmic suture products. David Green observed that the developing world absorbed only 10 percent of the global production of wound closure products because of their high price. Earlier Aravind used to purchase ophthalmic sutures from an organization that had a near-monopoly in India. Dr. V realized that there was a need for low-cost ophthalmic suture products. Aurolab was the first nonprofit organization to manufacture ophthalmic suture products. It started manufacturing suture products in 1998. These affordable products had FDA approval¹⁹ in the US and CE Mark Certification²⁰ in Europe. By 2003, Aurolab was selling more than a million ophthalmic suture needles every year.

¹⁶ The process of organizing positions into categories of work (classes) based on the similarity of duties, authority, and responsibility

¹⁷ David Green is an international consultant for developing sustainable eye care facilities.

¹⁸ www.indiatogether.org

¹⁹ FDA stands for "US Food & Drug Administration." FDA approval is necessary for companies (selling food and medicine) to market their goods officially in the US.

²⁰ CE Mark signifies compliance with applicable European Community directive (e.g., MDD, IVDD, or AIMDD).

Aravind deployed technology to serve people who were not able come to hospital. In 2003, Aravind was utilizing 30 Internet kiosks started by n-logue²¹ in remote villages of Tamil Nadu. These kiosks were started in huts and young local women were trained to run these kiosks. In each case, the person operating the kiosks took pictures of patient's eyes using a webcam (Refer to Exhibit IV) and sent them to the doctor along with a filled-in online questionnaire (symptoms of patient were recorded in this questionnaire). The doctor from Aravind hospital received it through e-mail instantaneously and interacted with the patient through an online chat (the person running kiosk acts as a facilitator) and gave him an appointment at hospital the following week, if he felt that physical examination was necessary. Otherwise, he gave his suggestions through e-mail immediately. Without the new technology, the same procedure would have taken a minimum of ten days, even when facilities such as a photo studio and a postal mail system were available. The new technology reduced both the time and the expenses incurred. Also, a poor villager could talk to a top class eye surgeon online. Most of the villagers in these villages had never spoken to a doctor in their life. Aravind's telemedicine²² was thus a boon to its customers.

The eye surgeons at Aravind too benefited by enhancing their skills through the Internet technologies. Now they could interact and share information with experts in other parts of the world through the Internet. They could even watch live surgeries being conducted in Boston, London or other parts of the world using internet technologies and employ what they learnt in treating their patients.

APOLLO HOSPITALS

Apollo Hospitals Enterprise Limited (Apollo) was the largest private hospital group in Asia with 28 hospitals and 5,658 beds. In 1979, AHEL was incorporated as a public limited company. Its promoter was Dr. Prathap C Reddy. It set up its first corporate hospital in Chennai, Tamil Nadu, in 1983. Apollo hospitals provided total healthcare services, from primary, secondary and tertiary care, to diagnostic services and pharmacies. Apollo revolutionized the healthcare industry in India by making its hospitals a one-stop location for people's healthcare needs. It made quality healthcare accessible to many, through its franchisee model of healthcare delivery. Gradually, Apollo grew into an integrated healthcare delivery company with a presence in health education and training, hospital consultancy, hospital architecture and design, medical BPO, retail pharmacies, franchisee clinics and third party administration (TPA). In 2003, Apollo was recognized as a 'Super brand of India' in the healthcare sector. It was selected out of a national list of 711 brands across 95 categories.

Initially, Apollo owned and managed its hospitals. Then it started managing non-owned hospitals with the Apollo brand name. This way it had the infrastructure ready without making huge investments and could run the hospitals with the same standards and quality as the owned hospitals. Later on, it moved into the franchisee model under which a non-owned hospital would be run with the Apollo brand name by the franchisee and Apollo itself would not be involved in the day-to-day management of the hospital. Through this route, Apollo made complete healthcare services accessible to more and more people.

²¹ n-logue is a commercial offshoot of the TeNet group. This is a research group started by a few professors at Indian Institute of Technology (IIT) Madras. This group developed CorDECT telecom technology, an innovative access network technology. The group also floated the company, Midas Communications. The main aim was to develop a telecom technology that would provide the rural Indians access to telephones. Midas now manufactures and markets this technology all over the world while n-Logue is the company which provides telephone and internet services in rural India. The company aspires to start similar facilities all over rural India in the next 10 years.

²² The use of interactive audio, video, or other electronic media (excluding telephones or fax machines) to deliver health care. The term includes the use of electronic media for diagnosis, consultation, treatment, transfer of medical data, and medical education.

Apart from large corporate hospitals, Apollo also started Apollo Clinics under its wholly owned subsidiary, Apollo Health and Lifestyle Ltd. These clinics provided primary and secondary care in several locations all over India. Some of these clinics specialized in providing care for certain diseases and health issues and also prevention of certain diseases and related health issues. Some such clinics were Apollo Adolescent clinic, Apollo Diabetic clinic, Apollo Aesthetic clinic, Apollo Breast clinic, Apollo Back clinic and Apollo Health and Diet clinic.

In the pre-launch stage, Apollo provided the clinics with support in areas such as preparation of project report, site selection, architecture and interior design, selection and procurement of medical equipment, manpower selection and training, information technology and systems, marketing strategy development and project coordination. On an on-going basis Apollo provided support in areas such as employee training, marketing, operations and quality assurance and technology upgrades. It has tied up with various organizations to provide support to the franchisees. It has tied up with IIM Bangalore for customized training for the franchisees and their heads of departments, Alfaz Miller of ABM Associates for architectural and interior design services, NIS Sparta for service quality training for front office and other staff, Wipro healthcare IT for clinic management software, MAA Bozell of the MAA Group for advertising and marketing communications, Ravi Bajaj institutional designer services for employee uniform design, and Good Relations for public relations.

In terms of medical services, the clinics provided services such as specialist consultations, preventive healthcare, minor procedures, tele-medicine consultations, diagnostics and pharmacy facilities. Specialist consultation of doctors from various medical fields such as Internal Medicine, Dermatology, Gynaecology, Paediatrics, etc was available. Dietitians and nutritionists could also be consulted for dietary and counseling services. The clinics also offered health checkup packages to promote preventive healthcare through regular checkups and early detection of diseases. These packages were same as those offered in the Apollo tertiary care facilities. The clinics had treatment rooms to perform minor and routine procedures such as suturing, first-aid, vaccinations, etc. However, emergency care services were not available at these clinics. Through the tele-medicine services at these clinics patients could consult with specialists at other locations in and outside India and could also obtain second opinion if they choose to. This service results in lower costs to the patient and saving of time as well. The clinics provided comprehensive diagnostic services as they have well equipped Laboratories, Imaging and Radiology departments and Cardiology departments. Every Apollo clinic had 24 hour pharmacy which was owned and operated by the franchisee.

Apollo was the pioneer in the field of tele-medicine as it was the first healthcare provider to setup a rural tele-medicine center in 1999. It was the largest tele-medicine solutions provider in India. Its network spread over 33 locations in India and neighboring countries. Apollo worked with the central state governments, medical bodies, private sector, public sector and others to spread the concept of tele-medicine. Apollo was also the first to set up a health insurance administration company in India. In 2003, it set up a TPA called Family Health Plan (FHPL), which began with administering a government insurance scheme. TPAs acted as nodal agencies between insurance companies, the insured member and the hospitals to enable insurance holders to access cashless medical treatment.

Through its franchisee model, Apollo made quality healthcare available to many people all over India. At a time when tertiary and specialty care was out of the reach of people in India, it delivered these through its large comprehensive corporate hospitals. Through its clinics it has been endeavoring to promote preventive care and disease control in India. Apollo's specialized clinics have brought new regimes of treatment to patients. For example, in November 2003, its Diabetic clinic in Chennai conducted special programs to disseminate information on diabetes care and control, and the latest advances in diabetes care. It also launched 'Apollo Diapack' which enabled patients to test themselves for diabetes. Special diabetic-friendly sweets and cakes were sold too.

In March 2004, AHIL announced its plans to launch boutique birthing centers called 'The Cradle'. These state-of-the-art specialized maternity care centers, would cater to the needs of expectant mothers and newborns.

DIAGNOSTIC CENTERS AND PATHOLOGY LABORATORIES

In the 1970s, most diagnostic centers and pathology labs in India were small individual owned centers and the services were highly localized. While there were some centers that were affiliated to large corporate hospitals, they were usually in the same premises and catered largely or exclusively to the needs of the hospital. But a trend of hub and spoke centers has emerged in recent times. Through the spokes the hub was able to extend its services to small towns and rural areas.

Dr Lal Path Labs Pvt. Ltd., was the largest pathology and diagnostic chain in India and had more than 50 years of experience in the field of pathology. It was also accredited by the National Board of Accreditation of Testing and Calibration Laboratories (NABL), making it one of the most dependable diagnostic labs in the country. Dr Lal Path Labs provided its services to almost 2,500 patients per day and offered over 1,400 different investigations and tests.

Dr Lal Path Labs was organized on the hub and spoke model. It had seven comprehensive labs established in Delhi, Mumbai, Kanpur which served as the hubs. There were almost 200 collection centers which acted as the spokes for these hubs. Samples were sent to these labs and later the results were delivered to the collection centers to be given to the customer.

Another pathology laboratory that worked on the hub and spoke model was the Thyrocare Biotech which was started by Dr A. Velumani. He was a research assistant at Bhabha Atomic Research Centre (BARC) which had a thyroid hospital that did research on diagnosis and treatment for thyroid disorders. After working at BARC for 14 years, during which time he also researched overseas thyroid centers, Velumani felt that he could do something of his own in the same field. So he quit his job and set up Thyrocare Biotech in 1996, using his Provident Fund money. Thyrocare specialized in immunodiagnosics, that is, testing blood samples for thyroid disorders.

Thyrocare had a central lab in Mumbai and 345 collection centers around the country. These centers were essentially franchisees which collected thyroid samples and would courier them to Mumbai where Thyrocare's central lab processed the results within five hours and rushed the results back to the collection centers. The samples were sent to the lab by air and the results were sent to the collection centers by email or fax. According to Velumani, on an average the lab tested 2000 samples a day. Thyrocare is now the world's largest thyroid testing laboratory, with ISO 9001-2000 certification.

FUTURE OF HEALTHCARE SERVICES INDUSTRY IN INDIA

Some analysts feel that the hub and spoke model will be increasingly popular, not only for diagnostic tests, but for specialized tertiary healthcare too, in the near future. At present, small towns have limited health services. The presence of 'spokes' will improve accessibility to standard healthcare in small towns. For specialty services, the 'spokes' will serve as reference points for 'hubs' which will be located in metros. Patients will receive sophisticated healthcare from the hubs and do not have to unnecessarily pay for bed usage. Healthcare service providers in the hubs will benefit from higher utilization of technology and lower investment on beds. Healthcare service providers offering specialized services will prefer a 'hub and spoke' network rather than starting a specialty hospital at a different location. These players will invest only in 'hubs' and form relationships with existing players who will be 'spokes'. This will enable the service providers to target a larger customer base, and make it easier for them to break even.

Exhibit I

Departments and Specialty Services at AIMS

1. Anaesthesiology - Critical Care Medicine
2. Analytical Toxicology Department
3. Cranio Maxillo Facial Department
4. Emergency Medicine Centre
5. Endocrinology and Diabetes Department
6. Infectious Diseases Department
7. Medicine and Geriatrics Department
8. Neonatology/Newborn Services Department
9. Neurosciences Institute - Department of Neurology, Department of Neurosurgery
10. Ophthalmology Department
11. Orthopaedic Institute
12. Paediatric Surgery Department
13. Urology and Renal Transplantation
14. Vascular Surgery Department
15. Cancer Institute
16. Chest Diseases Centre
17. Digestive Diseases Institute - Gastroenterology and Hepatology Department, GI Surgery Department
18. Employee Health - Lifestyle Management
19. Heart Institute -Adult Cardiology, Adult Cardiac and Vascular Surgery, Paediatric Cardiac Services, Paediatric Cardiovascular Surgery
20. Information Technology Department
21. Internal Medicine
22. Medical Imaging Center
23. Metabolic Disorders Laboratory
24. Mobile Medical Assistance Programme
25. Nephrology Department
26. Nuclear Medicine
27. Organ Transplant Programme
28. Paediatrics Department
29. Pain Relief and Palliative Care Unit
30. Pathology and Laboratory Medicine

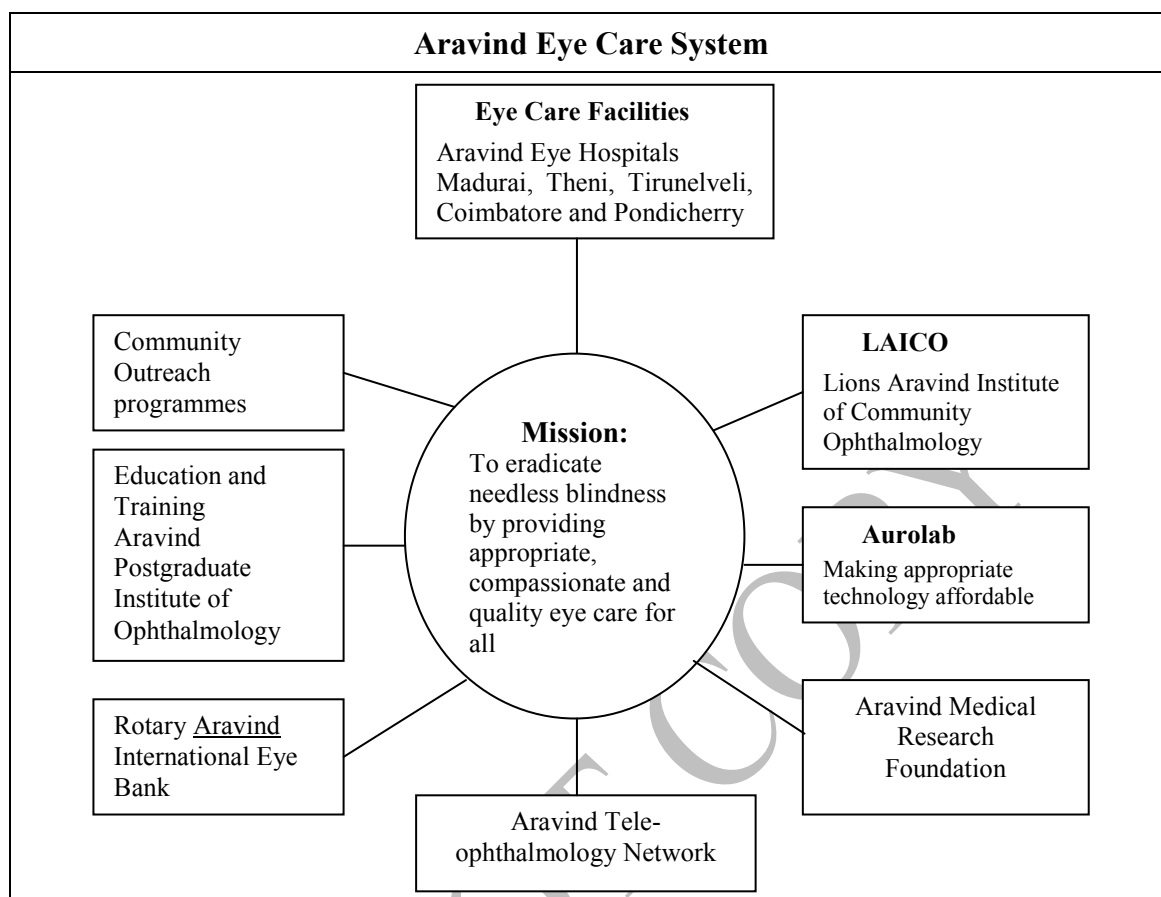
Source: www.aimshospital.org

Exhibit II

Services at AIMS	
	Tele Medicine Room
	Surgical Procedure
	After Surgery

Source: www.aimshospital.org

Exhibit III



Source: www.aravind.org, printed with permission.

Exhibit IV

A 70-year-old man in Pathinettangudi, mailing a Photograph of his Eyes to the Aravind Eye Hospital, Madurai, through Webcam for Consultation.



Source: <http://www.hinduonnet.com/thehindu/2002/04/22/stories/2002042201340500.htm>

Additional Readings & References:

1. **AIMS Telemedicine facility**, August 5, 2003, www.chennaionline.com
2. **Apollo is Superbrand**, September 15, 2003, www.chennaionline.com
3. **Apollo set to go places**, November 24, 2003, www.chennaionline.com
4. **Sharing excellence**, November 11, 2003, www.chennaionline.com
5. **Apollo Hospitals' sweet gesture**, November 17, 2003, www.chennaionline.com
6. **Apollo joins hands with Anna University**, October 9, 2003, www.chennaionline.com
7. **Directory of negative blood group donors**, October 6, 2003, www.chennaionline.com
8. **Apollo forays into boutique healthcare**, Company press release, March 19, 2004, New Delhi.
9. **Two new Lal diagnostic centres opened in SDA, Preet Vihar**, April 15, 2003, www.tribuneindia.com
10. **Dr. Lal Path Labs Pvt. Ltd.**, www.franchiseindia.com
11. T. Sarvanan, **One can't turn a blind eye to it!** May 26, 2003, www.hinduonnet.com
12. Vidya Subramanian, **Spearheading thyrocare**, June 24, 2002, www.blonnet.com
13. **Reliance Life in pact with Thyrocare**, January 29, www.thehindubusinessline.com
14. **India's First and Unique Thyroid Superspeciality**, www.indiaspace.com
15. **Great Indian medical tourism gold rush is here: CII, McKinsey**, April 9, 2004, www.indianexpress.com
16. **Low FDI, High Costs Hampering Healthcare, Say CII And McKinsey**, October 25, 2002, www.financialexpress.com
17. P.T. Jyothi Datta, **Scope for major corporate role in primary healthcare**, July 25, 2003, www.blonnet.com
18. Jayashree Padmini, **CII asks McKinsey to chart out roadmap for healthcare**, March 31, 2002, www.expresshealthcaremgmt.com
19. Preeti Mehra, **Private health sector - Can it deliver?** December 2, 2002, www.blonnet.com
20. Minu Jain, **India Emerging Top Medical Destination in Asia**, www.indiaday.org
21. Shobha Warriar, **We will make India the global healthcare destination: Reddy**, September 30, 2003, www.rediff.com
22. William McDonough, **How much can we give for all we get?** May 2003, MBDC Monthly feature.
23. Harriet Rubin, **The perfect vision of Dr. V**, February 2001, www.fastcompany.com
24. Pravir Malik, **Emergence of the fractal savant**, December 30, 2003, www.blonnet.com
25. G Sankaranarayanan, **The man and vision behind Aravind Eye Hospital**, Sept 1-15 2003, www.expresshealthcaremgmt.com
26. Sri Aurobindo, **The evolution of consciousness** November 1976, The Bulletin of Sri Aurobindo International Centre of Education.
27. B Surender, **The world's most efficient doctor**, Mansworldindia.com.

28. Joan Magretta, **What management is**, The free press, 2002, p 113.
29. Jim Collins, **Level 5 Leadership**, January 2001, Harvard Business Review, Vol.79, Issue 1.
30. Dr Venkataswamy, **Spirituality@work**, December 2003, Management next, Issue-8.
31. Jim Collins, **Good to Great**, Harper Business, 2001, (p118).
32. Vijay Kumar S, **A village where IT is a way of life**, April 22, 2002, www.hinduonnet.com
33. **Aravind eye hospitals**, **Social Entrepreneurship**, Greenblue.org.
34. **Investing in Private Healthcare in India; Funding Robust Business Models**, prepared by Infrastructure Development Finance Company Ltd., December 2002
35. **Indian Healthcare Sector; Key Trends in Indian Hospitals Segment** prepared by INGRES a division of ICRA Ltd., January 2004, www.icraindia.com
36. www.sulekha.com
37. www.indiatogether.org.
38. www.expresshealthcaremgmt.com
39. www.aimshospital.org
40. www.ciionline.org