2.1 Introduction

Globally, governments are searching for ways to improve equity, efficiency, effectiveness and responsiveness of their health systems. In recent years there has been an acceptance of the important role of primary healthcare in helping to achieve these aims, providing cost-effective healthcare to the general population\(^1\).

The Health Systems in low income countries with a significant primary care orientation tend to be more pro poor and accessible. The studies from developed countries demonstrate that an orientation towards a specialist based system enforces inequity in access. At the operational level, the majority of studies found that primary care physicians reduces costs and increases patient satisfaction with no adverse effects on patient outcomes or on quality of care.

Primary healthcare system in India is based on the Primary Health Centre (PHC). The responsibility of Primary Health Center is well equipped, soundly organized and beautifully situated which will be failed if the care is not in high quality. The integral, indispensable and important component of health care delivery system\(^2\) in public health is nursing. Primary care is the first level of contact and a link between individuals and the national health system which is bringing the healthcare delivery as close as possible to where people live and work. Approximately population of 25,000 is targeted in each and every PHC in providing promotive, preventive, curative and rehabilitative care. This implies offering a wide range of services such as health education, promotion of nutrition, basic sanitation, the provision of mother and child family welfare services, immunization, disease control and appropriate treatment for illness and injury. Normally the PHCs is the hub of 5-6 sub-centers, each sub-centers will cover 3-4 villages and are operated by an Auxiliary Nurse Midwife (ANM). These facilities are a part of the three tier healthcare system, the PHCs act as referral centers for the Community Health Centres (CHCs), 30-bed hospitals and higher order public hospitals at the taluka (THO) and district (DHO) levels covering Taluka Health Center and District Health Centers respectively.

\(^1\) Neesha Patel, (2005), Evaluating the use of Primary Health Center in India, Indian Journal of Community Medicine, 1-16.
The quality and efficiency of primary healthcare services in developing countries substantially affects the general health of a population. In India, although there are many reasons for poor PHC performance, almost all of them stem from weak stewardship of the sector, which produces a poor incentive framework. The World Health Organization (WHO) specifically points out that to some extent, the deterioration in health status is attributed to inadequacies in PHC implementation. The negligence of healthcare services is responsible for the deterioration due to lack of political commitment, inadequate allocation of financial resources to PHCs. The community participation in inter-sectoral strategies has been stagnated. The main issues related to the poor PHC performance due to bureaucratic approach to healthcare provision, lack of accountability and responsiveness to the general public and incongruence between available funding and commitments.

There is no formal feedback mechanism and incentive to treat citizens as their clients lacks the accountability. There are many complaints from patients due to rude behavior and abrupt health workers that discriminate against women and minorities. The main issues such as doctors absence, difficult to attract qualified doctors to rural areas, unresponsive ANMs, inconvenient opening times and little or no community participation leads to the lack of accountability. The lack of resources, which is acute in some states, is certainly a contributing factor to the poor performance of the primary healthcare system.

ICT can bring huge benefits to healthcare delivery by improving access, bringing efficiency, widening reach and reducing cost. While governments worldwide are spending huge financial resources on improving public health systems, some researchers argue that the mere application of funding will not solve many of the problems in e-government services, and more particularly in Public Health. Instead, suggested is a model of co-creation of services targeted to meet the specific needs of local communities which will require service designers to innovate and work with multiple stake-holders, including the local communities themselves. This requires giving patients and local communities the voice to participate in service design by suitably equipping them with the skills and tools necessary for effective participation.
2.2 Healthcare in India

The patients from Assam and Andhra Pradesh, the places like Tinsukiya and Aragonda require a special consultation from metro cities like Mumbai or from Bangalore. These places are far off from the metro cities will cost lot of money in travel and the time take to reach due to the poor rural settings in these states. There is always a challenge in reaching these places even if there is a specialist available in nearest town. By considering this setup the tele-medicine could be utilized extensively in effective healthcare delivery. The country like India has a diverse set of landscapes with mountains and valleys with high altitudes could very well be leveraged with tele-medicine mechanism for such patients.

In India, especially in Rural areas there is shortage of specialists or super. If there are not enough patients available in rural areas, specialist time can be utilized it properly through the technology intervention. Time can be cut in travel with the proper use of technologies. For any surgical procedure, the specialist’s physical presence becomes necessary and this also can be done through remotely with the proper guidance from the specialist. Most of the large healthcare organizations have adopted some form of Information Technology Solutions either home grown or procured from a vendor. The biggest challenge for large IT companies in this emerging healthcare sector is to cater the need of technological advancements. This has been taken care by providing the proper care with newer hospital setup across the country in tie up with the multinational IT companies. Public Sector spending in IT would generate interest in vendors primarily because the revenue stream is sizeable compared to private sector hospitals. State governments in several hospitals have initiated projects to implement IT solutions. Unfortunately, the lack of clarity in terms of common objectives/standards would limit the benefits.

2.3. Public Health Service Delivery

India has built up a vast health infrastructure and manpower in public and private sectors, with a wide variety of hospitals and dispensaries being set up at different levels. These institutions have been managed and maintained by qualified doctors and trained nurses. The substantial improvement in health indices of the population and a steep decline in mortality rates have triggered the expansion in access to healthcare services combined with technological advancements.
In India, the health sector has been fragmented between the States and Centre. Some of the services which come under states are public health, hospitals and sanitation. The Central Government caters the need of health services at the national level like population control and family welfare, quality control in manufacture of drugs, medical education and prevention of food adulteration.

The growth and development of healthcare sector in the country is managed and monitored by the Ministry of Health and Family Welfare (MoHFW) which is a nodal authority. The MoHFW is instrumental and responsible for implementation of various programmes on a national scale in the areas of health and family welfare, prevention and control of major communicable diseases as well as promotion of traditional and indigenous systems of medicines. This institution also assists States in preventing and controlling the spread of seasonal disease outbreaks and epidemics through financial and technical support. The Ministry comprises of the following departments:

1. Department of Health and Family Welfare
2. Department of Ayurveda,
3. Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH) and
4. Department of Health Research.

An examination of the causes of death in India suggests that greater emphasis be given to preventive measures in the health care delivery system. The poorer state of health in the rural areas calls for higher priority to the provision of medical care in rural areas. The nature of the prevalent diseases and the constraints of resources warrant a less sophisticated medical technology. Finally, an integrated approach, involving immunization, environmental sanitation, public health education, nutrition and medical care, is necessary for solving the country’s health problems.

2.4. ICT in Healthcare Sector Services

The current health care system is heavily doctor dependant. But doctors are best left to take care of patients. The efficiency and effective services can be provided through ICT in health sector. The ICT within healthcare sector in particular internet is driving the significant change in the healthcare services. The middle and high-income countries leverage the Internet dramatically in healthcare services such as access to
health information in digital form and ability to purchase pharmaceuticals and other health products. This has resulted in providing the health services to remote places through internet which is the backbone of ICT. The spread of broadband networks and the development of new e-health applications, defined as the use of ICT for health, have a mutually stimulating effect on further developments. This has resulted in access to numerous facilities through ICT. One of the key drivers to ICT adoption in developing countries is that the benefits of health communities do exchange their thought process.

In middle and high income developing countries, the ICT is increasingly well integrated in educational settings. The communication, collaboration and access to information are at the core of research and teaching. Universities in the developing world need to connect on an equal footing with their counterparts. This access will play an important role in advancing locally relevant research, and will improve capacity by enabling participation in the peer-review process required for publishing and participation in research conferences. Hospitals no longer need to have every type of special ward or unit. If the hospital is linked to a network, far away specialists can be consulted electronically.

Based on the findings, it’s evident that Online consultancy and online appointment plays a vital role in implementation of IT. The impact of information technology has been widely accepted by healthcare industry. The security and reliable data be very important and next important things are unique user ID, data backup, error free diagnostic testing and setting up a datacenter. The secure and reliable data transfer between the stakeholders is one of the key characteristics of healthcare. is is required in order to protect the sensitive personal data that is often involved. Health research and the health sector in general are experiencing a rapidly increasing need for high transmission bandwidth for high-resolution images and video streaming used for remote diagnostics, monitoring and the teaching of surgical techniques. In the 20th century especially in the last forty years, the ICT services resulted in development and deployment of IT systems in healthcare sector. This can be seen in technology usage of administrative applications, digitized diagnostic equipment and electronic health records. In an attempt to improve information flow and knowledge, many healthcare providers have invested in technologies such as online order entry, electronic medical records, and picture archiving and communications systems (PACS).
Fueled by the unrelenting pressures of cost, quality, and access, it’s believed that the first two decades of the 21st century are the era in which healthcare systems around the globe will be driven into crisis. Consumers worldwide are demanding more and better healthcare services. Virtually in every country, the growth in healthcare demand is increasing more rapidly than the willingness and more ominously the ability to pay for it. If left unaddressed, financial pressure, service demands driven by aging populations and other demographic shifts, consumerism, expensive new technologies and treatments and the increased burden of chronic and infectious diseases will cause most of the world’s countries to reach a breakpoint in their current paths. In other words, the healthcare systems will likely “hit the wall” be unable to continue on the current path and then, require immediate and major forced restructuring. The challenge with bigger geographic area is required in improved access to care is an important benefit of ICT.

The usage of ICT will improve access to services with the expectation behind public investment in e-health systems is to reduce the inequities experienced by people in remote locations. This is a serious matter in countries that have chronic shortages of physicians, nurses and health technicians. The problem of shortages is often coupled with public concern over access and demographic shifts with concomitant major health resource implications, such as ageing populations and rapid population growth in native or aboriginal communities. In this context, the adoption of ICT for remote diagnosis, monitoring and consultation will drive the goal of access to healthcare service.

The table 2.1 gives the broad area and examples of the use of ICT in healthcare services.
### TABLE 2.1

**BROAD AREA AND EXAMPLES OF THE USE OF ICT IN HEALTHCARE SERVICES**

<table>
<thead>
<tr>
<th>Broad area</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Delivery of health services</strong></td>
<td>1. Prevention of disease, health education and promotion, and support for diagnosis and treatment</td>
</tr>
<tr>
<td></td>
<td>2. Establishment of health registries and health information systems</td>
</tr>
<tr>
<td></td>
<td>3. Extension of care to rural and remote areas through telemedicine applications; increased access of rural health workers to specialist support and consultation</td>
</tr>
<tr>
<td><strong>Access to information and knowledge</strong></td>
<td>1. Improved access to health information, research, literature and training materials, such as access to biomedical and social sciences research. This supports the health research enterprise and enables comprehensive, evidence based management of acute and chronic conditions</td>
</tr>
<tr>
<td></td>
<td>2. Improved access to resources on prevention, awareness and education, for the general public as well as for health professionals, researchers and policy makers</td>
</tr>
<tr>
<td><strong>Health education and training</strong></td>
<td>1. Direct support to education and training for health professionals and workers, including both pre service education and in-service training and resources</td>
</tr>
<tr>
<td></td>
<td>2. Improved efficiency and effectiveness of education delivery through strategic application of ICT and ICT enabled skill development</td>
</tr>
<tr>
<td></td>
<td>3. Improved availability of quality educational resources through ICT</td>
</tr>
<tr>
<td></td>
<td>4. Outreach to special populations (girls and women) using appropriate technologies</td>
</tr>
<tr>
<td></td>
<td>5. Enhanced delivery of basic and in-service education</td>
</tr>
</tbody>
</table>
### Networking and collaboration

<table>
<thead>
<tr>
<th>Networking and collaboration</th>
<th>1. Collaboration for the management and coordination of care across different health providers, community health services and health institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Better exchange of knowledge among policy makers, practitioners and advocacy groups</td>
</tr>
<tr>
<td></td>
<td>3. Rapid and coordinated response to disasters and disease events</td>
</tr>
</tbody>
</table>

Health service providers are not only attempting to deliver more effective care, they are also attempting to deliver care that is safe. One of the ICT adoptions in healthcare sector is the quality of care. The important goals are required to measure the ICT, monitor and report on quality improvement initiatives. The usage of information systems such as pharmaceutical ordering systems that are proven to reduce errors. Developments such as e-prescription and computer assisted imaging are part of this. With respect to technology assisted care, it is critical to ensure that the care and information provided through e-health meet appropriate standards, relating to the quality of information transmitted as well as to the overall reliability of the system and the satisfaction of users, both professionals and patients.

#### 2.4.1 Benefits of Healthcare Sector using ICT:

One of the potential benefits of ICT is sharing of patients files easy without any threat to patient privacy. The ICT is used for hospital management such as admission and appointment management. The efficiency of ICT improves the medical personnel by minimizing the paper work and reducing waiting times. Both in developed nations and developing nations, ICT has benefited the healthcare sector. The benefits affect the hospital’s stakeholders with the management of the hospital, health personnel and patients. The usage of ICT in healthcare sector reduces the cost of running hospitals (Remlex, 2007). For patients, ICT assists in locating the health facility and this gives 24 hour access to health information. The data was protected through encryption and password protection which can help to keep patients’ data confidential. There has been considerable international discussion about the potential of ICTs to make major impacts in improving the health and well being of poor and

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marginalized populations, combating poverty, and encouraging sustainable development and governance. The effectiveness of ICTs has enormous potential as tools to increase information flows and the dissemination of evidence based knowledge, and to empower citizens. One of the major challenges in ICT adoption is not widely used in equitable healthcare access.

In developing countries, the critical mass of professional and community users of ICTs has not yet reached. Many of the approaches being used are still at a relatively new stage of implementation, with insufficient studies to establish their relevance, applicability or cost effectiveness (Martinez et al., 2001). This makes it difficult for governments of developing countries to determine their investment priorities (Chandrasekhar and Ghosh, 2001). However, there are a number of pilot projects that have demonstrated improvements such as a 50% reduction in mortality or 25-50% increases in productivity within the healthcare system (Greenberg, 2005).

The ICTs have clearly made an impact on health care in the following points:

- Improved the efficiency of administrative systems in healthcare facilities
- Experience demonstrates no single solution that will work in all settings.
- Effective healthcare research has been supported, access to research findings and dissemination of reports.
- Collaboration and Cooperation has been facilitated among health workers which includes the sharing of learning and training approaches
- The inpatient utilization across physical and behavioral care delivery systems and the mechanisms for reductions in avoidable emergency
- The incidence of public health threats have been strengthened the ability to monitor and respond in a more timely and effective manner.
- Mechanisms (e.g., pay-for-performance) for assessing and rewarding high quality care, particularly on indicators of collaboration.
- The public health information has improved dissemination and facilitated public discourse

• By the use of telemedicine the remote consultation, diagnosis and treatment can be done effectively

• The efficient and effective usage of ICTs reduces the complexity of choices of technologies. The health systems needs and demands suggests that the gradual introduction, testing and refining of new technologies.

2.4.2 Impact of Technology on Delivery System:

The Information Technology Solutions have been implemented in large healthcare organizations either home grown or procured from a vendor. The biggest challenge for large IT companies in this emerging healthcare sector is to cater the need of technological advancements. This has been taken care by providing the proper care with newer hospital setup across the country in tie up with the multinational IT companies. Public Sector spending in IT would generate interest in vendors primarily because the revenue stream is sizeable compared to private sector hospitals. State governments in several hospitals have initiated projects to implement IT solutions. Unfortunately, the lack of clarity in terms of common objectives/standards would limit the benefits. The re-emergence of e-health post dotcom days, e-health has been in the back burner. However, we would see the re-emergence of e-health. Online appointments and lab results would be initial applications to be widely used. In India, the healthcare management layer becomes more IT savvy, one will see the outsourcing of IT departments to vendors. They will be running the day to day operations of IT departments. Apart from the IT departments, there will be the emergence of service providers, handling back office operations for hospitals and third party administrators (TPAs).

Health Information Technology (HIT) (Brett, 2007)\(^7\) is used to store, protect, retrieve, and transfer information electronically within the health care settings. Some of the important elements of health IT include the following:

• Efficient communication and Electronic usage between the patients and health care providers

• EHRs (Electronic Health records) have been used for patients, in place of paper records.

\(^7\) Brett E, Dr. H. James Harrington, Praveen Gupta. (2007), Improving Healthcare Quality and Cost with Six Sigma, FT Press
- Healthcare providers streamline the processing of Electronic transmittal of medical test results.
- Health information for consumers is made available through web based by providing the confidential access
- Medical errors can be avoided with Electronic prescription of medications, treatments, and tests.
- The point of care is available through Electronic handheld devices.
- The patient or clinician secure electronic networks to deliver up-to-date records
- The best practices and treatment options have been provided with decision support systems

The effectiveness of HIT systems in healthcare service is provided through the proper quality and safety. HIT systems improve quality of care by avoiding duplication and medical errors. HIT systems can help ensure that physicians and other health care professionals have the most current information about the condition they are treating. The patients receive care from multiple health care providers. HIT works to ensure efficient, coordinated, and secure information exchange. The usage of HIT, researchers may learn more quickly about new treatments and therapies. The barriers in rural communities in getting the good, appropriate care when needed because physicians, hospitals, and other providers are in short supply. The goals of HIT in rural communities are to build telemedicine and tele health networks, improve patient safety and satisfaction, and foster community partnerships for health information exchange.

2.5. Public Private Partnerships - Healthcare Delivery Processes

The following points are to be considered the public private partnerships related to the healthcare delivery processes.

- To meet the national health goals, the Government of India is increasingly looking to the private sector for assistance.
- To bridge the gap between Government healthcare needs and public funded services need technical expertise
• The healthcare system strengthening reforms are promoted to encompass diverse concepts in modernization or providing technical expertise.

• The collaborative framework has been developed between different stakeholders.

• The efficiency of partnerships have broad guidelines available from the Government as well as International bodies in developing the established frameworks.

• The publicly available financed authorities provide healthcare services in collaboration with non-profit organizations.

• The efficiency of these partnerships have evolved numerous input and output factors. These factors are very critical and important in maintaining the good efficiency level.

• The Planning Commission’s Working Group recommended the guidelines for PPP model which has got the importance of formulating policies. The acceptance of PPPs in achieving the healthcare goals.

The table 2.2 gives the innovative models to make health markets more effective and equitable with suitable example.

### TABLE 2.2

**INNOVATIVE MODELS TO MAKE HEALTH MARKETS MORE EFFECTIVE AND EQUITABLE**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Potential opportunities/benefits</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educate patients to demand the most beneficial services and reduce asymmetries of information</td>
<td>• Increase demand for effective interventions, which may in turn increase supply</td>
<td>• Social marketing</td>
</tr>
<tr>
<td></td>
<td>• Reduce asymmetries of information</td>
<td>• Rural cooperatives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Conditional cash transfer programs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trusted knowledge brokers (citizen report cards, citizen complaint lines, consumer associations</td>
</tr>
</tbody>
</table>
| Use technologies that provide access and improve quality | • Increase efficiency  
• Improve quality and consistency | • Telemedicine  
• Call centers  
• Kiosks  
• Electronic medical records |
| Change provider incentives and increase monitoring | • Align provider incentives with patient need for quality, affordability, and access  
• Sharpen the focus on quality by making patient volumes and payments contingent on meeting standards  
• Strengthen the ethics and self-accountability of the private sector (foster ethical behavior, create standards) | • Network (HMO) models  
• Accreditation or licensing through professional association or other independent entities  
• Franchises  
• Pay for performance mechanisms  
• Any public or private demand side financing mechanism (insurance, vouchers), when coupled with purchasing mechanisms designed to improve quality |
| Reduce fragmentation of providers | • Increase transparency, reduce informality, and create visibility and legality  
• Make it easier and less costly to regulate (reduce both cost and potential principal-agent problems)  
• Reduce transaction costs/information costs  
• Increase oversight | • Franchises  
• Provider networks  
• Integrated models (pharmacy or clinic chains)  
• Professional associations |
| Provide subsidies for target populations and high-impact interventions | • Increase access to higher quality care for the poor, create incentives for private providers to serve the poor  
• Increase use of high-impact effective interventions | • Insurance  
• Vouchers |
| Provide quality care | Increase awareness among people | Create entrepreneurship opportunities |
2.6 Quality in Healthcare

Through all of human history, health caregivers have been respected individuals in society. Now with the Internet, consumerism, the Baby Boomers aging, risk adjustment, outcomes measurement, and quality metrics, blind trust in clinicians has begun to erode.

The “Crossing the Quality Chasm” reports (Committee on Quality of Healthcare in America, 2001)\(^8\) by the Institute of Medicine over the past decade have identified the stark reality of errors in the healthcare system more than 98,000 preventable deaths each year. Although the exact number is disputed, one life lost to error is one too many.

Many in academia, clinical practice, and government have suggested that use of information technology in healthcare is the answer to error reduction. However, information technology by itself can have only a limited impact, unless the information is used for deliberate improvement in healthcare practices. Despite the evidence that IT improves care, basic electronic information about patients remains out of reach for most clinicians.

The rising cost of healthcare and sustained poor quality mandates deployment of better practices and continual improvement in healthcare operations at a much faster rate than historically achieved. There have been many attempts to improve quality in healthcare, but most have been based on management fads and have been unsustainable. Six sigma methodologies have been deployed successfully in the industrial sector. If there are any errors in medical records, then healthcare professionals grieve about the failures in the healthcare provider's world. And when errors occur, healthcare professionals grieve. The processes and systems created for excellence is misaligned incentives which make it difficult. The healthcare professionals use Six Sigma approach to quality. The evidence based processes and procedures have been developed.

The healthcare sector has evolved significantly in last ten years to go into hyper change. Just as the computer and the Internet have enabled “telework”, home shopping, and a permanent change in the recording industry’s distribution strategy.

\(^8\) (Committee on Quality of Healthcare in America, 2001) – Crossing the quality chasm A New Health System for the 21st Century Committee on Quality of Health Care in America Institute of Medicine National Academy Press Washington, D.C.
Some of the activities that are unfolding the leading changes in healthcare are:

- The healthcare IT industry Evolution
- The consumerism in healthcare and
- Recognition of medical errors

The quality of information is the key in technologically advanced industry in healthcare sector. The developed countries like U.K., Australia, and Canada, has seen significant improvements in healthcare IT. The healthcare IT czar was appointed in United States. The IT improvements are dependent on standards, agreements, and legal modifications centered on the medical record. Some of the major changes are taking place in healthcare sector in providing the high quality information.

The significant problem with healthcare technology is that one hour of care in the emergency room means one hour of paperwork. It’s not a good way to keep content those people who went into the care professions. The major changes are taking place in U.S. government and several other governments around the world, is aggressively moving on the problems related to healthcare paperwork, lack of IT and the standardization and digitization of medical records.

### 2.7. The Indian Healthcare Industry

Traditionally, the healthcare sector in India has been dominated by a combination of smaller nursing homes, charitable hospitals, and government hospitals. However, the scenario is changing with a number of corporations like Fortis, Appollo, Narayan Hrudayalaya, Max and the Aditya Birla group entering the healthcare sector in a big way. Several hospitals set up under the Charitable Trust Act have developed as major centers. The main factor driving the overall sector growth is the demand supply gap. According to the World Health Organization (WHO), India needs to add 80,000 hospital beds every year for the next five years to meet the demands of its population. The demand supply gap is evident from the capacity utilization figures: against the international average of 40-50%, well managed Indian hospitals have a high 85-90% occupancy rates. Although about 68% of the hospitals are in the private sector, in terms of bed capacity, nearly 60% is in the public sector. However, people prefer to use the private sector facilities.
The privatization of health insurance is expected to bring in structural changes and demand for quality services. In India, the coverage of health insurance is one of the lowest in the world. More than 80% of the expenditure on healthcare is “out-of-the-pocket”. As health insurance companies start funding a larger percentage of healthcare costs, they are expected to have a major say in the running of the healthcare system in general, and hospitals in particular. This may include imposing caps on the amount they would reimburse for particular procedures, room charges, etc. There will be a lot of emphasis on standardization of facilities not only within a hospital or within a group of hospitals, but across groups of hospitals. Information technology will play a big role in this.

2.7.1 Convergence of Health Industry:

The Self Service Technology (SST) introduction in healthcare sector resulted in health diagnosis which has evolved to reduce costs and improve quality. The Technology Acceptance Model (TAM) for users, described according to the Technology Readiness Index (TRI) as pioneers, has a very good ability to predict future behavioral intent. The healthcare services have the capability to predict future behavioral intent of this new application in developing the TAM which is called as HITAM which is Healthcare Information Technology Acceptance Model.

As health care demands increase and the constituent roles blur, the industry will experience a gradual convergence. Convergence will redefine and create overlap in the boundaries between the traditional health industry suppliers and in the end this convergence will reshape the future of the health industry. The role of the key health industry constituents are patients, employers, health insurers, hospitals, physicians, Government, pharmaceutical companies and other industry suppliers, plagued with the decline of the health status and affordability. For the major suppliers in the industry, recognizing convergence is only the first step. Navigating convergence so the decisions made by an organization are both productive and profitable, rather than debilitating, is a far more complicated endeavor. The decisions made will not only affect the future of each supplier but also significantly impact the constituent at the center of this industry, the patient.
2.8 Technology Utilization in India

- Medical records Management of IT
- Health Management Information Systems (HMIS) in hospitals
- E-health, telemedicine are used in applying the process of delivery
- Government regulations, Standards and Ethical issues.
- Emergencies and crisis management is managed through the technology

The healthcare industry is evolving into a heterogeneous, distributed, and outsourced environment model. There is a need to push the regulatory standards for more interoperability, auditing, and automation is required. The leading healthcare related companies are ready to modify and integrate their existing environments to interact with a variety of business partners. The Healthcare medical providers are expanding their services from the local and regional level to the national level. Many of the vendors are leveraging the third party software products to support this growth in their business. Additionally, some national healthcare countries, such as Great Britain, are taking an international approach to standardizing data format and protocols used in the processing of patient records and healthcare visits.

Third party software vendors who develop healthcare related applications must produce easy to use, flexible software products to support the move to the standards being developed, and to adapt to the unique needs and constraints imposed by the international community. Healthcare insurance service providers, such as Blue Cross and Blue Shield or Medicare, routinely interact with a variety of entities such as hospitals, medical clinics, billing agencies and so on to determine what patient services have been provided and who needs to be paid. This diverse set of contacts can result in a potential interoperability nightmare unless common standards can be applied to the process.

The changing healthcare business environment requires a process based approach that integrates with business partners, technology that provides a flexible, dynamic environment, and a variable cost financial model in conjunction with a clear delivery model. To summarize, the healthcare industry is a prime candidate for a Service Oriented Architecture (SOA) solution, coupled with an on demand approach.