Telemedicine Based on Healthcare System

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Abstract—Telemedicine is the process that allows the professionals of the healthcare to assess, diagnose and to treat the patients with the help of modern technology i.e., telecommunication technology even from a long distance. In this paper some of the topics of last 40years has been discussed i.e. where the work of Telemedicine has been held, what advantages it provided to the health care system, what was the main use of those advantages and so on. Thus from our study we get to know that the fundamental of Telemedicine is mainly to transfer the medical data, and for that purpose several telecommunication technologies such as Radio frequency communication, satellite communication, are used. The main use of telemedicine can be seen in rural sphere. Thus day by day the technology of Telemedicine has provided many facilities to the health care system and has increased patient's satisfaction level to its top and hopefully will provide a lot of amazing features in the future.

Keywords—Telemedicine.

I. INTRODUCTION

Telemedicine may be defined as the process that allows the professionals of the healthcare to assess, diagnose and to treat the patients with the help of modern technology i.e., telecommunication technology even from a long distance. The information and telecommunication technology have a major use which provide health care system from a distance to the patients. Patients can easily have their treatment without any doctor's visit. It became very much easy to get communicated with the specialists with the help of this technology and due to this lives can also be saved in critical and exigency situation.

The main use of telemedicine can be seen in rural sphere. Inequality can be observed in health care adeptness in many developing countries including India also. As we know, 75% of the population in India lives in rural sphere but the same percentile of doctors in India are from cities, and due to this, millions of Rural Indians faces difficulties for accessing to basic health care system. A small amount of India's annual gross domestic product i.e. only 0.9%, spends on health care and a few percent of this spending is reached on Rural sphere. As a result, Rural India used to have a very poor health care substructure and it is inconceivable to retain doctors in that area. So, people from rural areas have to travel a lot for consulting with doctors and specialists and due to this the villagers used to spend a major part of their income on travelling. A research conducted by the Indian Institute of Public Opinion shows that 89% patients of rural India used to travel around 8km to get basic medical treatment and sometimes in some cases even more and as a result it has no permanent solution. But with the help of telecommunication technology in healthcare system, Rural Indians may get benefited and the system of telemedicine may turn out day by day as one of the cheapest as well as fastest for rural patients and it will bring specialized healthcare installations and proficiency to the remotest areas of our country [1].

The main concept of telemedicine is based on simply four methods and they are as follows:
- Data acquisition
- Data transmission
- Data receiving
- Data evaluation

The fundament of telemedicine is to transfer the medical data, and for that purpose several telecommunication technologies such as Radio frequency communication, satellite communication, are used. But in health care practical application the use of Radio Frequency Communication technology, such as the transmittance of biomedical information and signals are often flustered by the interference of electromagnetic waves, and as the signals get perturbed due to this kind of interference, the biomedical information or data get reduced in its accuracy and reliability.

II. RELATED WORK

The inception of telecommunication in health care system has been observed with the use of Telegraphy in the early **1900s**.

In the year **1980**, with the help of telemedicine, a connection was established between two places namely, Sioux Lookout Zone Hospital and Toronto. With the help of telemedicine, it became possible for the doctors in Toronto to get connected with the patients in Sioux Lookout. In Northern Ontario, the Sioux system almost covers a sphere of about 285000 km and it provides health care services to 10,000 people. At that time the Sioux Hospital used to have only 70 numbers of beds for patients and that time the total number of people in the town was 3500. In that Zone there was a family with four physicians who used to provide primary and secondary care to the patients and twice in a week they used have a regular access in all the communities. At that time, for managing a patient, the physicians used to communicate with the doctors through telephone and in that the process of Telemedicine was started with the use of this telephone and for even more than 25 years, technology became so much advance that this telephone has been used in health care system. Their whole study was divided into several steps. In the first step the work done by the family physicians was observed with attention to recover the data and for the communication purpose. Physicians were asked about what they need for visualising the image which will be helpful for their diagnoses. So, with the help of this information they developed their next phase i.e. methodological analysis of various technologies. There were four types of communication modes and they were Black & White Television, Colour Television, and Consultation through Face-to-Face and Hands-Free Telephone. Each and every patient were attended by different physicians and nurse during each of the telecommunication process. During that time, the reaction of all the patients were very much positive for all the modes but the doctors as well as the nurses who examined the patients, they gave the preference to the mode of Colour Television. After then, a six-month of experiment was done in Toronto. During that time, several physicians examined more than 1100 patients through any of these four modes. Day by day the mode got varied and at the end of those six-month experiments a total of about 250-280 patients got examined with any one of the mode. All the four modes were accepted by all the patients very positively and they found that there was no such difference between all the four modes and no such benefits have been got from the expensive Broad-band systems over that technology. As they found fewer differences between all the modes, the physicians felt that their research in city will not be able to reflect all the problems of health care in remote spheres and for further research a two-year study was done in Sioux Lookout Zone [2].

In **1998**, a paper was published on Otolaryngology i.e. the very oldest technology in medical system in the United States which may be defined as the technique in which the physicians get trained in the medical management as well as in the surgical management and the patients having ENT disorders get well treatment. As technology is growing faster, we can see a reflection of Tele otolaryngology in reality. The trial system of Tele otolaryngology was mainly designed to show the utility of mainly three systems of Telemedicine in the practice of otolaryngology.

The first system may be known as Optel and it is known to be a desktop system which was used in the office. Second one is a mobile system known as Picasso and its main advantage was that it can be used from different locations of the hospital. And the last system known to be Georgia State-wide Telemedicine Program i.e. GSTP which is large advanced system mainly used in the rural hospitals from any fixed location. That time patient having different ENT problems gets consultation at two medical centres in Georgia State-wide Telemedicine Program. Over a total period of two-year, 54 consultations were completed. At that time the otolaryngologist accessed 9 different medical field. With the help of these three systems various consultations were completed i.e., five consultations via Optel system, thirteen consultations via Picasso System and thirty-six consultations via the system known as Georgia State-wide Telemedicine Program.

So, from this paper we can get a review that the physicians got connected with good quality and better audio visual communication system which was provided by Tele otolaryngology for the improvement capabilities and treatments for the patients [3].

In **1999**, Mobile Communication technique has been used for transmitting more data together in a single time from moving vehicles during emergency cases. During that time people used to spend a lot of time while moving in vehicles; for example, in ships that used to ply through the ocean and in aircraft also and thus the emergency cases of such situations got increased day by day. Thus at that time it was recognized that telemedicine was very much useful for emergency cases [4].

In the same year, Telemedicine has also been used in the field of Haemodialysis i.e. the transplantation of kidney, which is one of the renal replacement therapy. We can define the Haemodialysis as one of the end stage treatments after the renal part gets weaken completely. About 30 years earlier this Home Haemodialysis i.e. HD treatment was first coming into practice for the patients having End Stage Renal Disease i.e. ESRD. This paper gives a review about Telematics Monitoring Services i.e. TMS for helping the patients who mainly needs Satellite Haemodialysis i.e. SD or Home Haemodialysis techniques. Over a period of complete 5 months 150 HD sessions with the help of Haemodialysis machine have been performed in about 9 patients and no complications had been observed with any of the patients during the Haemodialysis treatment [5].

In the year **2000**, a remote expert system was developed mainly for infectious diseases which helped the non-specialists for selecting the proper treatment for the patients having diseases which are very much infectious. With the help of modem and telephone, all about 50 doctors conducted a trial of the database and during a study period of about 8 months an approx. of about 1055 queries got received. About 45% of queries were received of the patients having infectious diseases. And at the end of the project the response rate was 100%. Each and every doctors even those who were having less experience found it quite easy to use and understand the database system [6].

In **2001**, a newest technology was observed in the field of telemedicine i.e. the Technology completely based on Bluetooth. At that time, the Bluetooth Technology was already added to the Internet based system, which was mainly used for collecting the ECGs data. During that time, a wireless system was developed with the help of this Bluetooth technology for transmitting the data about a range of 15m-20m. And during that time their study resulted for the ECGs based Telemedicine System [7].

In the same year the expansion of Information Technology in supporting very particular errands and administrations has made it progressively imperative to comprehend the various fundamentals to innovation acknowledgement by people. In a normal expert setting, the fundamental attributes of user technology and context may vary impressively from those in conventional business settings. The investigation inspected physician's acknowledgement of Telemedicine Technology. Following a hypothesis correlation approach, it assessed the degree to which winning intention-based models, including the Technology Acceptance Model i.e. TAM the hypothesis of planned behaviour and an Integrated Model, could clarify singular physician's technology acknowledgement choices. In light of reactions from in excess of 400 doctors, the two models were assessed as far as by and large fit, informative control, and their casual connections. By and large, discoveries recommend that TAM might be more suitable than TPB for looking at innovative acknowledgement by singular experts and that the Integrated Model, albeit all the more completely delineating doctor's innovation acknowledgement, may not give noteworthy extra logical power. Likewise, instruments created and over and over tried in earlier examinations including ordinary end-clients and business supervisors may not be substantial in proficient settings. And in this paper a few intriguing ramifications are additionally talked about [8].

In the year **2002**, a paper was published which described the role of Telemedicine and its improvement in the field of healthcare. Data and Communication Technology assumes an inexorably critical job in conveying healthcare today. Social insurance experts, including specialists and medical

caretakers, are occupied with what is viewed as an extreme activity plan for enhancing the National Health Service in the United Kingdom. A noteworthy focal point of this arrangement is the more noteworthy strengthening of the patient, and furnishing them with more data about their wellbeing needs and care. Data and Communication Technology can possibly adequately bolster the complexities engaged with the correspondence that happens both among Healthcare labourers themselves and between Healthcare specialists and their patients in both essential and optional consideration both in the United Kingdom and somewhere else. This paper investigates the difficulties engaged with human cooperation and portray how AIDMAN, a clinical data framework, considers more extravagant correspondence between the patient and those associated with their wellbeing [9].

In **2003**, for managing the Cardio-Vascular system, a technology which was completely based on internet has been observed for monitoring the ECG system and for analysing the rate of heart. During that time a GSM-ECG system was developed with the GPRS technique with an internet facility for analysis both offline as well as online based ECG data. They discussed about their three different studies which they have performed for the determination of the role of nonlinear heart rate in the group of various kind of diseases. The main motive of their study was to analyse the result of long period based ECG data. They followed their ECG work in the field of Telemedicine wirelessly and they denoted their system of Telemedicine as Cyber ECG System. Thus a simple view of this cyber ECG System is shown.
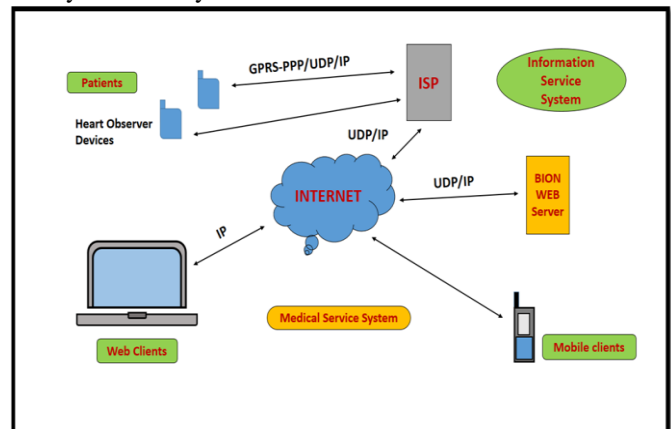

Figure 1. The Cyber ECG System.

In this Figure 1 we can see that the small shaped devices get communicated through GPRS and the operation of the GPRS can get changed from 1-12 channel of ECG with the help of OTA. The digitalized recorder of ECG transmits the data that get compressed with the help of wireless network. The WEB mainly contains the ECG data and it mainly transmits the ECG to the medical system and the staffs seated there could

easily analyse the patients with the help of mobile or computer or laptop. Thus in this way they performed some nonlinearity of the heart rate by repeating several other works performed by several other authors [10].

In the same year a proper connection has been made between patients and technology and the technology in the field of Telemedicine was mainly designed to reduce the travelling cost mainly in emergency cases. In this paper the author mentioned that in the year 2000, a healthcare administration was implemented namely, Veterans Health Administration i.e. VHA which used to cover the Veterans mainly in Florida, the Virgin Islands, in South Georgia and in Puerto Rico through CCCS. It was mainly used to support the Veteran Health Administration and mainly used home technology. It was very difficult to choose the correct tools and proper technology for an individual patient to get the success in the Community Care Coordination Service model and at that time to visualize the practices i.e. best among the all, an algorithm with new technology was mainly developed across the Network. The author also mentioned that in Maryland there was a University where a methodology was mainly designed by a research team of healthcare Economist and it was mainly used to discover each and every patient's comfort with proper technology. And as a result the satisfaction level of each and every patient was very high and everyone accepted as well as used the technology without facing any difficulty and the ratio of their acceptance was greater than the number of expectation [11].

In **2004**, a paper was published on Tele-ophthalmology which is mainly used for Eye-care purposes mainly in those areas where it is difficult to access an ophthalmologist and they used it in such a location where there was no ophthalmologist i.e. in an island namely Tungyin which was 200km from Taiwan. In this paper the author mentioned that a screening program was organized for eye disease and approx. to about 31% of the total population was enrolled in this program. During that time for diagnosis purpose transmission of images were done with the help of ADSL i.e. Asymmetric digital subscriber line and the data were transmitted to the specialist in Taiwan. The time used to take for the transmission of the data was approx. 60secs to 90secs and the average time taken for processing the data was approximately 6.4secs per subject and the time taken for a single diagnosis purpose was approx. 34secs. Thus with the help of this Tele-ophthalmology technology different cases were observed [12].

In **2005**, a paper has been published by ISRO, which describes the concept of Telemedicine through space. Since, India is one of the vast countries in the world and day by day with the advancement of Technologies the country is reaching higher in its level. As we know that almost 75% of the doctors in India practices in urban centres and a very few percentile of doctors do practice in rural areas but most of the

populations are mainly from rural sphere. Since, from the study we get to know that Telemedicine is the mixture of different technologies such as Information Technology, Communication Technology, Medical science and Biomedical Engineering and the main function of Telemedicine is completely based on hardware as well as software at both specialists as well as patients' end. Some of its diagnostic equipment such as X-Ray, Camera, ECG and microphones were provided at patients end and they got connected through the system known as VSAT system i.e. Very Small Aperture Terminal System and the system used to get controlled by ISRO with the help of National Hub Station. Since, the process of Telemedicine is completely based on the system where transmission of data from patients to doctors or specialists took place with the help of communication system through the medium of satellite in the form of small digitized data information packets. And thus the data packets gets received by the specialists or doctors centres and with the help of this system it becomes possible for the doctors or specialists to study about the each and every patient's condition and to consult them the proper treatment for their health issue during a conference call with the patients and it became very much comfortable for the patients too to get communicated with the doctors or specialists very easily and as a result it helps in the reduction of their transportation cost also. Thus the facility of Telemedicine helps the patients to get communicated with the doctors separated by thousands of miles and as a result it saves a lot of time of the patients as well as the specialists and in this way the process of telemedicine got expanded day by day all over the world in the healthcare system. Thus some types of communicating system have been discussed in this paper and they are as follows:

a) **Point-to-Point-System**: This System mainly defines the direct connection between a doctor and a patient in a hospital i.e. a direct link will be formed between the doctor and the patient.

b) **Point-to-Multi-Point-System**: The Point-to-Multi-Point-System mainly defines the connection between one patient to any of the doctor present in the hospital at a time.

c) **Multi-Point-to-Multi-Point-System**: The Multi-Point-to-Multi-Point-System mainly defines the connections between many patients from different hospitals to different doctors or specialists presented at different locations in different hospitals.

Thus the initiatives taken by ISRO for Telemedicine shows major roles in different parts such as in rural hospitals, specialty hospitals, disaster management supports, Village Resource Centres and many more. At that time during a disastrous Tsunami, facilities of Telemedicine were provided by ISRO at three different hospitals namely INHS Dhanvantari located at Port Blair, GB Pant Hospital,

Andaman Island and Bishop Richardson Hospital located at car Nicobar for the benefit of the populations of the Island and day by day many more Telemedicine centres were planned in the Andaman and Nicobar Island. Thus the endeavour of Telemedicine by ISRO is getting expanding day by day and is reaching a new level in the healthcare system as well as in the facilities all over the country. Thus Telemedicine is becoming the hope for countries which will make an enlargement between life and death and it will help the needy in its hard time [13].

Another paper was published in the same year on the management of asthma problem with the help of mobile phone technology. National and international guidelines of asthma guidelines widely recommend the peak flow monitoring, but have a poor adherence to the traditional pen and paper recordings. In this paper author have mentioned that in the year 2003 for an approx. period of 9 months an observational study was organised in United Kingdom by using the technology of the mobile phone and electronic peak flow monitoring. During that time by using General Practitioner, patients have been judged and were controlled by a regular based inhaler namely Glucocorticosteroids. In Maidenhead area as well as in the Slough, patients those who were between the age of 12-55 years and required regular treatment for inhalation were recruited from 9 general practices. But there was so many complaints received during the first outcome and as a result during the second time helpline were provided to the patients with the medium of a telephone and the patients got satisfactory response with the help of that system. An electronic peak flow meter has been used which was connected with the mobile phone and instructions have been delivered to each and every patient to complete the reading of the peak flow in the morning as well as in the evening also. As a result, the data that got recorded on the mobile phone get transmitted with the help of General Packet Radio Service network in Oxford to a secure server and an immediate feedback were sent back to the mobile from Oxford. Since then also there was some complaints and then they thought to analyse one reading in the morning and one in the evening i.e. at least two readings from the patients have been taken every day and with the end of their study within one month questions have been distributed among the participants. Thus according to their results 91 patients were recruited where 58% were over 18years and about 42% were under 18years and the total mean duration time took to complete the record of first and last data was about 203 days [14].

In **2006**, a device having Bluetooth as well as Holter Capabilities has been generated for the application of Telemedicine for monitoring ECG data. It was mainly developed for clinical environment as well as for the non-clinical environment to provide continuous services to the patients. This ECG monitoring device can collect the date,

store the data as well as it can transmit the data i.e. the ECG signals to the access points with the help of internet. The data that can be acquired can also be stored in a memory card for recovery purpose and can be transmitted using Bluetooth technology or with the help of USB to the access point and thus the acquisition process of ECG got operated in two modes namely Online Transmission mode and Holter Mode. But while operating in the Holter mode the memory cards that has been tested, exceeds the normal sampling rate and as a result Trans-Flash was selected because it was smaller than the others. Thus an aim was generated in the reliability of transmission with the help of variety of electronic devices such as WIFI devices and cordless devices which will operate in the same range of frequency and will adversely affect the transmission at different distances with the help of Bluetooth Technology [15].

Since, day by day technologies getting more advanced so with this advancement, new innovative technologies have been found out in **2010**, to identify and to mainly treat the injury of Traumatic Brain which mainly includes the crossover technologies as well as approaches between the military and the civilian applications. From this paper we get to know that Traumatic injury, a brain injury which is very much complex having wide symptoms as well as disabilities has become the most dangerous injury of Operation Enduring Freedom and Operation Iraq freedom. Because of the use of explosive devices there was an exponential increase in both Afghanistan and Iraq, but with the improvement of the technology in the care of Trauma, have increased a lot of chance of survival. This kind of injuries can be occurred both physically and mentally and it can often be hidden or it can also be misdiagnosed. But the army in U.S. mainly wanted a solution for the treatment of TBI which used to have a long lasting effect on the warfighter. To mainly determine about the current technologies and methods the Advanced Technology Research Center and the U.S. army's Telemedicine made a partnership with an association namely American Telemedicine Association mainly to organize a program on **Innovative New Technologies to Identify and Treat Traumatic Brain Injuries : Crossover Technologies and Approaches Between Military and Civilian Applications** which was held on September 2009 in Palm Springs, CA and their main motive was to provide an opportunity to the leaders from the organizations which was involved in Telemedicine and to get related and collaborated with new partnerships. This paper mainly gives us a review about the awareness program which was designed to help Telemedicine as well as Advances Technology Research Centre in order to increase the collaboration with different center and to provide new ideas and technologies for the betterment of healthcare issues [16].

In the same year another paper was published on Tele-health which was mainly focused on home Spirometry after the

transplantation of lungs. Here Home Spirometry was mainly used for the detection of changes in graft function and for these wireless devices like cell phone which were equipped with Bluetooth was used. Since, lungs transplantation can be taken as a cure process for those patients who have pulmonary diseases. So Home Spirometry was depended on many centres for the detection of changes in the early graft function i.e. the function which was mainly graded after the transplantation of lungs on the basis of FEV in just 1 second. And to measure this Forced Expiratory Volume in home a Spirometry device was provided to the recipients of lungs transplantation which allowed them to take the measurements independently and if in FEV there was any deterioration generated during the Home Spirometry process then the patients were instructed to have an immediate visit to the specialists or to a doctor. Since, deterioration is very much nonspecific and if occurs then it needs more progress in the work. Though in this paper the author has mentioned that Home Spirometry had been proved as beneficial during the early identifications of some syndromes and it has been shown by Retrospective single centre trials and thus the Home Spirometry process was demonstrated as one of the process that reduces a lot of travelling cost of the patients [17].

In the year **2011**, a new Telemedicine application was invented in which ECG data could be collected on Smartphones through Wireless Body Sensors [18].
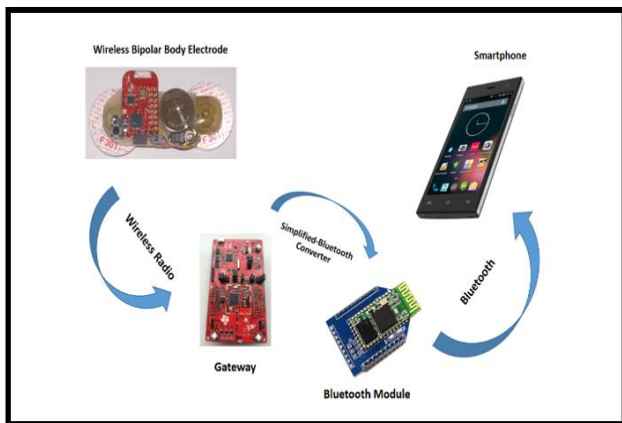

Figure 2. System Design.

In **2015**, the impact of SOA (Service Oriented Architecture) was observed for telemedicine healthcare system. Thus day by day with the increase in technology the need of the Telemedicine getting escalates in the area of healthcare system. This paper mainly gives us a review about the architecture which was based on Service Oriented Architecture and since there was several problems in interoperability as well as in vendor locking system so they mainly performed a solution for this system for avoiding the problems. Thus from this paper we get to know that they mainly focused on the application of Tele-Wound system. The Tele-Wound system mainly divided into two part i.e. one part will be available on the doctors or specialists end and another part will be available on the patient end. Thus from patients end the nurse will collect the data and he/she will transmit the data to the doctors or specialists end and the communication between this two ends will be possible by using online/offline method i.e. by using either the MMSs system or by using emails through computers or mobile phones. Thus there were some basic requirements such as functional and non-functional which was fulfilled, because if the requirements were not fulfilled then there would not be a possibility to complete the project.

Thus the functional requirements were:

a) When the MMSs data would be sent to the receiver, the receiver should receive the data which will contain the picture of the patients.
b) Same function should also be performed for email application also i.e. the doctor or specialist should receive the email having an attachment file with a patient's picture.
c) The records of each and every patient should be stored in the form of text including their pictures also.
d) The application should be available in such a way that all the records of each and every patient should be saved with exact date and time with patients' telephone number and with security number as well.
e) Thus the doctors will be easily able to check the record of each and every patient from their security numbers.

The non-functional requirements were:
a) The application must be easy to use for the communication purpose from both the ends.
b) The system should be faster enough for sending as well as for receiving the response.
c) The performance of the application should be good enough with the occurrence of any problem.
d) The application of the Tele-wound system should be completely free of error. Thus if any error occurs then the application should have the ability to re-establish the performance.

Thus the design of the application was completely based on Service Oriented Architecture and for the implementation of the system the idea of Create Read Update and Delete i.e. CRUD was used. Thus with the help of this architecture a solution was generated for the vendor locking problem as well as for the interoperability and data integration and based on the Service Oriented Architecture the outcome was good enough [19].

In the last year **2017**, a scientific statement has been made for Healthcare Professionals from the American Heart Association/American Stroke Association which published a report regarding Telemedicine Quality and Outcomes in Stroke. This paper defines about Tele-stroke which is one of the mostly used and the rapidly growing applications of telemedicine, which mainly delivers the stroke experts to the hospitals and to the patients. It gives a review about Tele-stroke and gives suggestion about the quality and for the improvement of the performance and enhancing delivery of care.

In this paper the main idea of all the committee members was focused on Tele-Stroke Network. And thus this paper gives a result of the Models of Tele-stroke and the role of Tele-stroke in stroke systems of care. They have given a brief description about the quality and about the experience in quality measures for stroke. Thus the technology of Tele-stroke was reviewed and suggestions have been provided for quality metrics [20].

III.   METHODOLOGY

Telemedicine may be defined as the process that allows the professionals of the healthcare to assess, diagnose and to treat the patients with the help of modern technology i.e., telecommunication technology even from a long distance. The information and telecommunication technology have a major use which provide health care system from a distance to the patients. Patients can easily have their treatment without any doctor's visit and it became very much easy to get communicated with the specialists with the help of this technology and due to this lives can also be saved in critical and exigency situation. So, it became very much easy to get communicated with the specialists from home also and all the thanks goes to Telemedicine and it connects the patients with the doctors or specialists through wireless devices such as mobile phones, laptops, tablets. Thus it was an innovative idea to link the patients with the specialists which also decreases the transportation costs as well as saved a lot of time. This technology mainly helped in bringing the healthcare service to the patients where ever they are present and thus remarkable results were obtained in the rural areas with the help of this Technology.

So, the fundament of Telemedicine is to transfer the medical data, and for that purpose several telecommunication technologies such as Radio frequency communication, satellite communication, are used.   But in health care practical application the use of Radio Frequency Communication technology, such as the transmittance of biomedical information and signals are often flustered by the interference of electromagnetic waves, and as the signals get perturbed due to this kind of interference, the biomedical

information or data get reduced in its accuracy and reliability. Thus we are looking forward about what the Telemedicine Technology is going to provide us in the coming future.
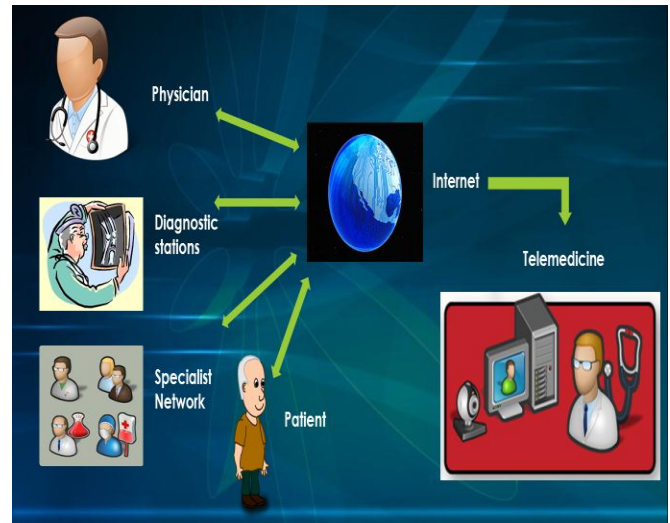

Figure 3. Block Diagram of Telemedicine.

IV.   ADVANTAGES OF TELEMEDICINE

The main growth of Telemedicine mainly based on four fundamentals and they are:

a)   For more than 50 years the technology of Telemedicine provided health care system to the patients presented in different and distant locations in rural areas as well as in urban areas and it also helped the doctors or the specialists to work beyond their own clinics and offices.
b)   Telemedicine plays an important role on travelling cost. It mainly reduced the transportation cost of the patients and helped them to get communicated with the doctors or specialists through network medium.
c)   Day by day Telemedicine providing us the best quality products in the medical health care system.
d)   Demand of the patients is increasing day by day as the main impact of the Telemedicine is mainly focused on the patients with their community.

V.   APPLICATION OF TELEMEDICINE

The applications of the Telemedicine are listed as follows:

a) Home care & Ambulatory: In Home Care process the patient suffering from any sort of diseases or may be those who are getting older or for the recovering process needs special and personal care staying their home itself

such as the physician will help the patient in dressing up, for bathing, for eating, for washing hairs and so on.

b) Disaster Management: The main issue in this system is the safety of patients where the process of Telemedicine is significant.

c) Medical education & public awareness: Thus proper education should be given to the public about Telemedicine so that they will be able to understand and will be able to cooperate in the Telemedicine process for their betterment.

d) Remote consultation & critical care monitoring.

e) Tele-mentored procedure or Robotic surgery.

VI. CONCLUSION ANN FUTURE SCOPE

Telemedicine is a valuable tool in which the patients gets evaluated and treated by the health care providers from longer distance. Thus the services provided by Telemedicine are offered at lower costs and it becomes easier for the patients to achieve the health care process. Telemedicine not only reduces the time of both the patients and doctors but also lowers the travelling cost of the patients. Thus day by day it becomes very much easier for the doctors to detect various diseases of the patients in very lesser amount of time. As we know that Rural India used to have a very poor health care substructure and it is inconceivable to retain doctors in that area. So, people from rural areas have to travel a lot for consulting with doctors and specialists and due to that the villagers used to spend a major part of their income on travelling. So, with the advancement of technology it became very much easier for the people living in rural areas as compared to those in urban areas to get communicated with the doctors. Thus the main steps that needs to be taken for reaching the Telemedicine technology to the common public mainly includes some factors and they are:

a) Medical Education Process: Proper education should be given to the common peoples about their health and various medical teaching techniques should be utilised.

b) Public Awareness Programs: Different types of public awareness programs should be organized i.e. the type of programs which will be able to change the visualisation of the public about a certain issue.

c) Proper funds should be given for the improvement of the medical facilities for the patients.

d) Travelling Cost should be reduced as much as possible mainly for the rural spheres.

Thus the future of telemedicine mainly depends on:

- Human healthcare policy
- Economics Growth and
- Technology

So, technology has made Telemedicine easier for doctors to detect patient's problem very easily. As a result, it became very much easier for the people in rural areas to get communicate with the doctors or specialists and with the growth of the technology it reduces the travelling cost and saved a lot of time of both patients and doctors. Thus we are looking forward about what the Telemedicine Technology is further going to provide us in the coming future.

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