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Article

Study on Role of Advanced A.I. Technologies to deal with Healthcare Issues and its Awareness amongst Healthcare Professionals

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A B S T R A C T

Healthcare is one of the major domain sectors of our country. As this domain has many different aspect of implementation, as per the current scenario of Diseases and health complications. This paper will discuss about why, the artificial intelligence (A.I.) play's an important role on, Healthcare domain with respect to the Efficiently Diagnose, Developing New Medicines, Earlier Detection of Diseases, Advance Treatment Care. As this Information will help to give more clarity on due to the lack it, how Healthcare domain will get affected and what are the negative down fall, on absence of such major resource on Treatment process. This will also include a brief introduction on A.I. & Robotics contributes for the major Diseases Treatment by the advancement of Technology. This can be beneficial not only Doctors, Patients, or Firm but can also be helpful for citizen people as well. The Objective of this paper is to address Healthcare Issues due to the lack of the Advanced A.I. Technologies.

Keywords: Artificial Intelligence, A.I. to Efficiently Diagnose, Report Analysis with A.I., Deep Learning, Health Services, Treating Rare Disease with A.I., Patient Record Analysis, A.I. to Efficiently Diagnose and Reduce Error, Pharmaceuticals, Diagnostics, Medical Equipment and Supplies

Introduction[1]

Healthcare Domain

The Healthcare industry is one of the largest industries in the world and it has a direct effect on the quality of life of people in each country. Healthcare (or healthcare) is the diagnosis, treatment and prevention of disease, illness, injury and other physical and mental impairments in humans.[2] The Healthcare industry, or medical industry, is a sector that provides goods and services to treat patients with curative, preventive, rehabilitative or palliative care.[3]

What is an A.I.?

Artificial Intelligence is an advance to make a computer, a robot or manufactured goods to think how smart human think. AI is a study of how human brain think, learn, decide and work, when it tries to solve problems. And finally this study outputs intelligent software systems. The aim of AI is to improve computer functions which are related to human knowledge, for example, reasoning, learning and problem-solving.[4]

Artificial Intelligence (A.I.) is rapidly entering into Healthcare and serving major roles, from automating drudgery and

routine tasks in medical practice to managing patients and medical resources. As developers create AI systems to take on these tasks, several risks and challenges emerge, including the risk of injuries to patients from AI system errors, the risk to patient privacy of data acquisition and AI inference and more.[5] In the major Domain of Healthcare, the current scenario of Diseases and health complications which can be treated by implementing Artificial Intelligence (A.I.) in Healthcare. The Artificial Intelligence In Healthcare is revolutionizing the medical industry by providing a helping hand.[6] AI is getting increasingly sophisticated at doing what humans do, but more efficiently, more quickly and at a lower cost. The potential for both AI and robotics in healthcare is vast. Just like in our every-day lives, AI and robotics are increasingly a part of our healthcare eco-system.[7]

Sectors of Healthcare Industry

The healthcare industry provides a variety of services to support the healthcare needs of a community or individuals. The healthcare industry classifies the different products it offers by sector. Hospitals and healthcare systems are continually changing their service offerings and responding to various internal and external forces including reimbursement issues, advances in technology and shifts in the populations they serve.[8]

The key sectors of healthcare industry can be broadly classified into following four sub-segments:

Healthcare Services and Facilities

Healthcare services and facilities subsector is comprised of many subsectors. The broad classification includes:

Hospitals

Hospitals provide medical, diagnostic and treatment services to inpatients and some outpatient services. This category includes General medical and surgical hospitals, Psychiatric and substance abuse hospitals, Specialty hospitals (not including psychiatric and substance abuse facilities), Family Planning & Abortion Clinics, Hospices & Palliative Care Centers, Emergency & Other Outpatient Care Centers, Sleep Disorder Clinics, Dental Laboratories and Blood & Organ Banks.

Nursing and Residential Care Facilities

They provide residential care combined with either nursing, supervisory, or other types of care as needed. This category includes Home Healthcare services, Nursing Care Facilities, Urgent Care Centers, Mental health and residential developmental handicap facilities, In-Home Senior Care, Community care facilities for the elderly and other residential care facilities.

Ambulatory Healthcare Services

Players provide direct and indirect Healthcare services to ambulatory patients. This category includes Outpatient care centers, Medical and diagnostic laboratories, Ambulance Services and other ambulatory Healthcare services.

Medical Practitioners & Healthcare Professionals

This category includes Medical Practitioners, Chiropractors, Homeopaths, Psychologists, Social Workers & Marriage Counselors, Dermatologists, Nutritionists & Dietitians, Optometrists, Physical Therapists and other alternative Healthcare Providers.[8]

Medical Devices, Equipment and Hospital Supplies Manufacturer

These are medical companies in the forefront of the latest medical technology offering their products across the whole spectrum of medical equipment, hospital supplies, products and services, including specialist applications. This sector further consists of many players including In-vitro diagnostic substances, Electro-medical and electro therapeutic apparatuses , Irradiation apparatuses, Surgical Instrument & Medical Instrument Manufacturing, Surgical appliances and supplies, Dental equipment and supplies, Ophthalmic goods, Vital Signs Monitor Manufacturing, Mammography Machine Manufacturing, TENS Machine Manufacturing, Nebulizer Manufacturing, Hot & Cold Topical Therapy Manufacturing, Optical Coherence Tomography Machine Manufacturing, Medical Laser Machine Manufacturing, Medical Device Manufacturing, Medical Instrument & Supply Manufacturing, Robotic Surgery Equipment Manufacturing.[8]

Medical Insurance, Medical Services and Managed Care

This segment deals with the players that provide medical insurance or different types of services to either patients or other medical sector players. The term managed care or managed Healthcare is used to describe a variety of techniques intended to reduce the cost of providing health benefits and improve the quality of care for organizations that use those techniques or provide them as services to other organizations. This sector further consists of many players including Health maintenance organizations (HMOs), Preferred provider organizations, Exclusive provider organizations, Medicare, Medicaid, Healthcare Consultants, Medical Patient Financing, Healthcare Staff Recruitment Agencies, Health & Medical Insurance, Surgical Apparel Manufacturing, Medical Supplies Wholesaling, Medical Waste Disposal Services, Dental Insurance, Medical Couriers, Medical Device Cleaning & Recycling, Medical Claims Processing Services, Pharmacy Benefit Management, Corporate Wellness Services, Home Medical Equipment Rentals and Medical Case Management Services etc.[8]

Pharmaceuticals & Related Segments

The pharmaceutical industry develops, produces and

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markets drugs or pharmaceuticals licensed for use as medications. Pharmaceuticals eliminate the need for inpatient and invasive care services. They are subject to a variety of laws and regulations regarding the patenting, testing and ensuring safety and efficacy and marketing of drugs. This sector further consists of many players including Over-the-Counter (OTC) drugs & Drug Stores, Prescription drugs, Biopharmaceutical drugs, Generic drugs, Pharmaceuticals Packing & Labeling Services, Dietary Fiber Supplement Manufacturing, Vitamin & Supplement Manufacturing, Cough & Cold Medicine Manufacturing, Health Stores and Eye Glasses & Contact Lens Stores etc.[8]

Health Services

Health services consist of medical professionals, organizations and ancillary Healthcare workers who provide medical care to those in need. Health services serve patients, families, communities and populations. They cover emergency, preventative, rehabilitative, long-term, hospital, diagnostic, primary, palliative and home care. These services are centered around making Healthcare accessible, high quality and patient-centered. Many different types of care and providers are necessary in order to offer successful health services.[9]

Types of Services

Health services cover many different types of medical issues. Many people think of primary care, outpatient care and emergency care, when they need an illness managed or is generally not feeling well. However, there are more health services that are dedicated to certain illnesses or issues.[8]

These health services include:

- Mental Healthcare
- Dental care
- Laboratory and diagnostic care
- Substance abuse treatment
- Preventative care
- Physical and occupational therapy
- Nutritional support
- Pharmaceutical care
- Transportation
- Prenatal care
- Blood & Organ Banks
- Medical and diagnostic laboratories[8]

Aims and Objectives

- The aims and objectives of the study on the Healthcare Issues due to the lack of the Advanced A.I. Technologies
- To Understand, the role A.I. Technologies and their contribution in the Healthcare.
- To evaluate the impact on HealthCare due to the lack of Effective HealthCare Treatment Technologies.
- To study usability level of A.I. in HealthCare amongst Doctor's.
- To give the Applications of A.I and Robotics in Healthcare Domain.
- To understand, how effectively the IT Technologies can solve HealthCare Issues.

Review of Literature

A study was conducted by Drs. Jonathan Lewin and Jeffrey Balser in "Healthcare leaders must embrace, advance AI" state that, AI requires that our healthcare and biomedical science workforces acquire new competencies, which can and will impact care delivery. It is up to hospitals and health systems and their leaders to embrace these technologies.[10]

Form the study by Trishan Panch, Heather Mattie & Leo Anthony Celi in "The 'inconvenient truth' about AI in healthcare" state that, AI innovations by themselves do not re-engineer the incentives that support existing ways of working.Simply adding AI applications to a fragmented system will not create sustainable change.[11]

It has found by Nuffield Council on Bioethics on "Artificial Intelligence (AI) in healthcare and research" state that, The use of AI raises a number of ethical and social issues, many of which overlap with issues raised by the use of data and healthcare technologies more broadly.[12]

Base on the study of, Emily La Rosa & David Danks in "Impacts on Trust of Healthcare AI" implies that, as current AI and robotic technologies unfold and permeate aspects of healthcare, the nature of the patient-doctor relationship and its foundational trust will be challenged and likely changed.[13]

It has found by Sandeep Reddy & John Fox from" Artificial intelligence-enabled healthcare delivery" state that, A.I. techniques are now actively being applied in healthcare with many of the health service activities currently being delivered by clinicians and administrators predicted to be taken over by AI in the coming years.[14]

Dr. Eric Topol on their study "Preparing the healthcare workforce to deliver the digital future" state that, Digital healthcare technologies offer the potential to reshape

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the patient-National Health Service (NHS) relationship, empowering both staff and patients who are willing and able to become more actively engaged.[15]

As Amit Patel was review on "How Artificial Intelligence and Robotics is Transforming Healthcare?" state that, Artificial intelligence services have transformed the healthcare industry, which has resulted in significant improvements in patient care. Healthcare providers are now using AI-powered mobile applications to improve their care delivery process.[16]

Also, Dr. Farzan Majidfar in his research work "Automation of Knowledge Work in Medicine and Healthcare: Future and Challenges" state that, Combine the AI with biological data of patients to define the differences between healthy and respectful environments with the disease and helps in the discovery and development of drugs, diagnostics and healthcare applications.[17]

Methodology

This research work is used to evaluate and understand the impact on HealthCare due to the lack of Effective A.I. technologies and I.T. Equipments on their Healthcare process, as how it can be manage. Survey based methodology is used to collect the opinion and views of verities of HealthCare domain's in order to collect the quality value information for the presented research paper. This literature review does not support sufficient data to understand the usage and implementation of A.I. amongst every domain of a HealthCare sector. Hence, Quantitative approach was implemented to understand the same. This survey method was used to get data. Where a, Questionnaire and Face-to-face Interviews were conducted to get appropriate information from the respondents along with the dataset from a renown site's. The specific requirements and their importance on that sector were selected to do the survey on the allotted Area in order to collect the up-to-date status review in the HealthCare Domain. .

An initial consent was acquired from various research domains and affiliated content centers to carry out the well-designed survey. A written communication was sent to various supporting teams so as to carry out the survey department wise. Before the start of the survey the respondents were made aware about the study and its relevance to them in their respective domains. A proper research centers and affiliated website was decided to collect the valuable survey data so as to get the desired and relevant information for the proposed research paper. The sample size of respondents was calculated from the various set of informative. Stratified Random sampling method was implemented to select the required respondents. The respondents comprised of local Hospitals, Research Center, Manufacturing Industry and many HealthCare bodies to get how they are contributing for Disease cure and human health wellness.

A.I. Applications in Healthcare

AI has countless applications in healthcare. Whether it's being used to discover links between genetic codes, to power surgical robots or even to maximize hospital efficiency, AI has been a boon to the healthcare industry.[3]

A.I. to Efficiently Diagnose and Reduce Error

In 2015, misdiagnosing illness and medical error accounted for 10% of all US deaths. In light of that, the promise of improving the diagnostic process is one of AI's most exciting healthcare applications. Incomplete medical histories and large case loads can lead to deadly human errors. Immune to those variables, AI can predict and diagnose disease at a faster rate than most medical professionals. In one study, for example, an AI model using algorithms and deep learning diagnosed breast cancer at a higher rate than 11 pathologists.[3]

More Accurate Cancer diagnosis with A.I.

How it's using AI in healthcare: Path AI is developing machine learning technology to assist pathologists in making more accurate diagnoses. The company's current goals include reducing error in cancer diagnosis and developing methods for individualized medical treatment.

Path AI has worked with drug developers like Bristol-Myers Squibb and organizations like the Bill & Melinda Gates Foundation to expand its AI technology into other healthcare industries.[3]

Health an Intelligent Symptom Checker

How it's using AI in healthcare: Buoy Health is an AI-based symptom and cure checker that uses algorithms to diagnose and treat illness. Here's how it works: a Chabot listens to a patient's symptoms and health concerns, then guides that patient to the correct care based on its diagnosis. Harvard Medical School is just one of the many hospitals and healthcare providers that use Buoy's AI to help diagnose and treat patients more quickly.[3]

A.I. Deep Learning for Actionable Insights

How it's using AI in healthcare: Enclitic develops deep

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learning medical tools to streamline radiology diagnoses. The company's deep learning platform analyzes unstructured medical data (radiology images, blood tests, EKGs, genomics, patient medical history) to give doctors better insight into a patient's real-time needs. MIT named Enclitic the 5th smartest artificial intelligence company in the world, ranking above Face book and Microsoft.[3]

Earlier Cancer Detection with A.I.

How it's using AI in healthcare: Freenome uses AI in screenings, diagnostic tests and blood work to test for cancer. By deploying AI at general screenings, Freenome aims to detect cancer in its earliest stages and subsequently develop new treatments.[3]

Diagnosing Deadly Blood Diseases Faster

How it's using AI in healthcare: Harvard University's teaching hospital, Beth Israel Deaconess Medical Center, is using artificial intelligence to diagnose potentially deadly blood diseases at a very early stage. Doctors are using AI-enhanced microscopes to scan for harmful bacteria's (like E. coli and staphylococcus) in blood samples at a faster rate than is possible using manual scanning. The scientists used 25,000 images of blood samples to teach the machines how to search for bacteria. The machines then learned how to identify and predict harmful bacteria in blood with 95% accuracy.[3]

Treating Rare Disease with A.I

How it's using AI in healthcare: BERG is a clinical-stage, AI-based biotech platform that maps diseases to accelerate the discovery and development of breakthrough medicines. By combining its "Interrogative Biology" approach with traditional R&D, BERG can develop more robust product candidates that fight rare diseases. BERG recently presented its findings on Parkinson's disease treatment; they used AI to find links between chemicals in the human body that were previously unknown at the Neuroscience 2018 conference.[3]

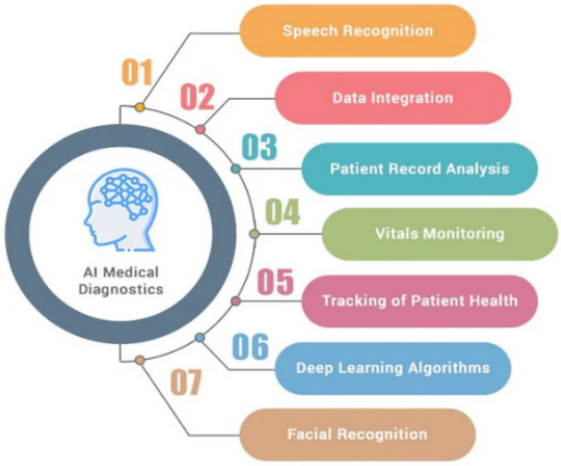
A.I. Offers Predictive Medical Testing and Applications

Predictive analysis is a feature of artificial intelligence that has been highlighted as one of the main advantages of this technology. This predictive feature is not solely confined to claims management, but also extends itself toward medical diagnosis of medical tests that detect infections, conditions and diseases in laboratory settings. These tests are generally, In Vitro Diagnostics (IVD), wherein the same is taken from the human body (such as blood or tissue) to scan for results.[18]

It is not surprising to note that many deaths have occurred due to diagnostic errors that are caused through inefficient correspondence, gaps in communication and overall inadequacies in the healthcare environment. The leveraging of AI solutions for medical diagnostics is a growing phenomenon. Applications, such as, chatbots, oncology, pathology and rare diseases are further enhanced through the use of AI.

These applications are embedded with the following features:

- Speech Recognition
- Data Integration
- Patient Record Analysis
- Vitals Monitoring
- Tracking of Patient Health
- Deep Learning Algorithms
- Facial Recognition



However, medical diagnostics AI applications are still in their nascent stages and will be continually evolving over the next few decades. Its reliability and efficiency are still to be completely analyzed. Although, it is safe to say that this is going to be the next big thing in AI-driven solutions.[18]

Health Sector Challenges due to lack of Efficient Technology]

Inefficiencies and Errors in Data Sharing

In an age, where medical science has made marvelous advancements, inefficiencies and errors in healthcare are still persistent because of low-key technology that the healthcare industry adopts for management. The pen-and-paper approach is still followed largely around the world, even in a developed economy like the USA. This will result on, not only do patients pay the price in the form of inconvenience and health, but also do we see a rise in administrative expense and litigation because of these inefficiencies and errors

Solution: The most up-and-coming solution to this healthcare management problem is the use of a block chain-based database to store and share patient records. This healthcare technology trend can not only permit quick and complete

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transfer of data but also in security, thus maintaining the privacy and integrity of patient information.[19]

Remote Access to Telemedicine and Mobile Healthcare

Making telemedicine accessible remotely is a challenge that is substantial enough to deserve the first position on this list all to its own. In fact, telemedicine together with mobile healthcare, are endeavors that aim to raise the level of health in an age where wearables and Smartphone's are used to track and improve health.

Solution: As the digital technologies can improve the functionality of telemedicine, through the web and mobile healthcare applications that are getting better each day in providing a platform that connects the two parties seamlessly. Developers continue to expand the consistency and performance abilities of these remote-oriented platforms, thereby creating a more accessible and reliable experience for medical professionals who provide patient care and advice from miles away, or from a different nation or continent for that matter.[19]

Medical Treatments Error and Problems

A 2013 study in the Journal of Patient Safety found 210,000 to 440,000 patients die each year from hospital errors and hospital care-caused harm. This would make medical errors the third-leading cause of death. You'll find a good summary of that study in a Pro-Publican article. So how can hospitals and providers bring error rates down and thereby save patients from undue suffering and possible death?[19]

Mistakes often happen when providers fail to follow one or more of what are known as the five rights of medication administration:

- Verifying the dosage
- Timing
- Patient
- Particular medication
- Delivery route.[21]

Solution: Computerization of ordering is a powerful intervention for improving drug safety because ordering errors are a frequent type of medication error.[22] Today individuals, especially seniors who may require more medications than the average person, are able to wear special medical bracelets. These bracelets are equipped with an individual barcode to help hospitals track doses of medications, which reduces errors. The Internet is also a helpful tool in reducing prescription mistakes because there are many available web sites that tell you all you need to know about a drug, even if you lost the bottle it came in.[23]

Wastefulness and Un-optimized Supply Management

As patients, we probably never think of the logistics that lie behind healthcare services. But, they form the backbone of the industry. Efficient logistics practices ensure uninterrupted healthcare services. Managing these logistics is, nevertheless, a tricky task. While it may sound more like a supply chain mismanagement problem, it very well creates troubles like mismanaged medical inventory, equipment or drug shortage at the backend.

Solution: A strong data management system is one that is not only constantly updated and operates within an easy-to-use Graphic User Interface (GUI), but also operates across in-house terminals and mobile platforms. This way, administrative and medical professionals alike, have immediate access to accurate inventory numbers and current budget allocations.[19]

Medicare and Medicaid Reimbursement

As the procedures for filing and receiving Medicare and Medicaid undergo a change in most nations, it's just one more thing on the to-do list of healthcare professionals. The regulations now oblige them to store and record patient records for the services rendered in a particular format. Whenever treatment is availed under Medicare, the doctors need to fill out the prescribed electronic forms as proof that the patient has, in fact, received the healthcare service.

Solution: Electronic Health Record (EHR) systems facilitate appropriate electronic forms for Medicaid and Medicare reimbursement from the government. It is easy for healthcare professionals to keep the patients' health records and fill out the forms for reimbursement when the service has been provided. These systems also help improve the transaction of information from the doctors to the government and vice versa.[19]

AI and Healthcare Segments in India

The healthcare industry in India is made up of a number of segments. Through a review of companies developing AI solutions for health, health practitioners using AI and researchers looking into the potential of AI and health, it was found that AI is employed in a variety of ways across the different segments including:

Hospitals: These include government hospitals, including healthcare centres, district hospitals and general hospitals; and private hospitals, which include nursing homes and mid-tier and top-tier private hospitals. From a review of solutions adopted it appears that hospitals in India are employing descriptive and predictive AI.[24]

Pharmaceuticals: These include manufacturing, extraction, processing, purification and packaging of chemical materials for use as medications for humans or animals. From a review of solutions adopted it appears that pharmaceuticals in India are employing descriptive and predictive AI with prototypes for prescriptive AI being developed and tested.[24]

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Diagnostics: These comprise businesses and laboratories that offer analytical or diagnostic services. In addition to bigger companies such as Google and IBM, India is also host to startup companies that specialize in harnessing AI to diagnose disease. From a review of solutions adopted it appears that diagnostics in India are employing descriptive and predictive AI.[24]

Medical Equipment and Supplies: This includes establishment's primarily manufacturing medical equipment and supplies, e.g. surgical, dental, orthopedic, ophthalmologic, laboratory instruments, etc. From a review of solutions adopted it appears that companies developing medical equipment and supplies in India are employing descriptive and predictive AI.[24]

Medical Insurance: This includes health insurance and medical reimbursement facilities, covering an individual's hospitalization expenses incurred due to sickness. From a review of solutions adopted it appears that companies offering medical insurance in India are employing descriptive and predictive AI.[24]

Telemedicine: Telemedicine utilizes electronic communications and software to remotely provide clinical services to patients. It is frequently used for follow-up visits, management of chronic conditions, medication management, specialist consultation and other clinical services that can be provided remotely via secure video and audio connections.65 This bypasses barriers of time and space and serves to provide isolated communities with speedy delivery of medical expertise.66 From a review of solutions adopted it appears that companies developing telemedicine platforms in India are employing descriptive and predictive AI.[24]

Government Initiatives in Healthcare by A.I Implementation

Nationale Health Authority (NeHA)

NEHA was proposed by the Ministry of Health and Family Welfare in 2015 as an authority to be responsible for the development of an integrated health information system in India. It will be the nodal authority that will develop an integrated health information system along with the application of telemedicine and mobile health by collaborating with various stakeholders.[24]

Artificial Intelligence Task Force

The 'Task Force on AI for India's Economic Transformation' was set up by the Ministry of Commerce and Industry in 2017 to explore possibilities to leverage AI for development across various fields. It will submit concrete and implementable recommendations for government, industry and research institutions. It consists of experts, academics, researchers and industry leaders, as well as government participation through representatives of the NITI Aayog, Ministry of Electronics and Information Technology, Department of Science & Technology, UIDAI and DRDO.[24]

United States–India Science & Technology Endowment Fund (USISTEF)

The governments of the United States of America (through the Department of State) and India (through the Department of Science & Technology) have established the United States– India Science & Technology Endowment Fund (USISTEF) for the promotion of joint activities that would lead to innovation and entrepreneurship through the application of science and technology. 77 Grants of up to INR 25 million are awarded to bi-national teams of entrepreneurs and innovators who have an innovative product beyond the idea stage with a high societal impact and the potential to commercialize within 2-3 years.[24]

Policy Group on Artificial Intelligence

The Ministry of Electronics and Information Technology has recently formed a "policy group" to study aspects of AI technology and formulate a policy framework and road map for its adoption. The policy group will consist of representatives from academia as well as NASSCOM for an industry perspective and will focus on aspects such as privacy, security, liability and skilling the workforce.[24]

National IPR Policy

In 2016, the Department of Industrial Policy and Promotion ("DIPP") released the NIPR themed 'Creative India; Innovative India', which focuses on creating awareness on the importance of IPR as a marketable financial asset and economic tool. It lays down seven broad objectives ranging from awareness creation to strengthening enforcement and adjudication mechanisms for combating infringement. The NIPR recognizes the potential for innovation that exists in new and emerging technologies and talks about developing novel technology platforms in order to ensure enhanced access to affordable medicines and other healthcare solutions.[24]

Cognitive Science Research Initiative (CSRI), Department of Science & Technology

The Cognitive Science Research Initiative was initiated in 2008 as a platform to enable the scientific community to deal with challenges related to cognitive disorders and social issues through the use of psychological tools & batteries, early diagnosis & better therapies, intervention technologies and rehabilitation programmers.[24]

Centre of Excellence for Data Science and Artificial Intelligence (CoE-DS&AI)

The Government of Karnataka, in collaboration with NASSCOM, is setting up a Centre of Excellence for Data Science and Artificial Intelligence (CoE-DS&AI) 83 at

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an estimated cost of INR 40 crore on a public-private partnership model to "accelerate the ecosystem in Karnataka by providing the impetus for the development of data science and artificial intelligence across the country" and position is as one of the top five global innovation centre's in AI over the next five years.[24]

The future of AI in healthcare

We believe that AI has an important role to play in the healthcare offerings of the future. In the form of machine learning, it is the primary capability behind the development of precision medicine, widely agreed to be a sorely needed advance in care. Although early efforts at providing diagnosis and treatment recommendations have proven challenging, we expect that AI will ultimately master that domain as well. Given the rapid advances in AI for imaging analysis, it seems likely that most radiology and pathology images will be examined at some point by a machine. Speech and text recognition are already employed for tasks like patient communication and capture of clinical notes and their usage will increase.[25]

The greatest challenge to AI in these healthcare domains is not whether the technologies will be capable enough to be useful, but rather ensuring their adoption in daily clinical practice. For widespread adoption to take place, AI systems must be approved by regulators, integrated with EHR systems, standardized to a sufficient degree that similar products work in a similar fashion, taught to clinicians, paid for by public or private payer organizations and updated over time in the field. These challenges will ultimately be overcome, but they will take much longer to do so than it will take for the technologies themselves to mature. As a result, we expect to see limited use of AI in clinical practice within 5 years and more extensive use within 10. Perhaps the only healthcare providers who will lose their jobs over time may be those who refuse to work alongside artificial intelligence.[25]

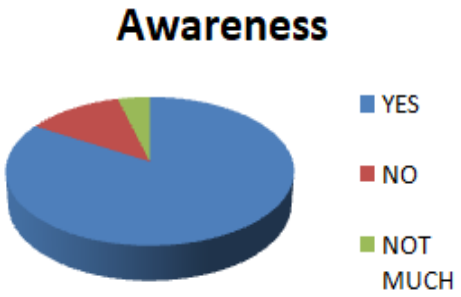
Result and Discussion

A study was conducted in the various Research center, Hospitals, medical bodies along with a people's at general for ground level scenarios. A view of several medical doctors and their patients along with the common people were taken, to conduct this study of *"Healthcare Issues on lack of the Advanced A.I. Technologies"* through questionnaire.

To understand, the Applications outcome and growth of A.I and Robotics in Healthcare Domain as how effectively the IT Technologies can solve Healthcare Issues. The Study used Descriptive methodology which involved survey of 120 participants from Research and Medical centers. Where a well designed pretested Questionnaires was administrated amongst the respondents, so as to gather knowledge, role of A.I. in the HealthCare Domain.

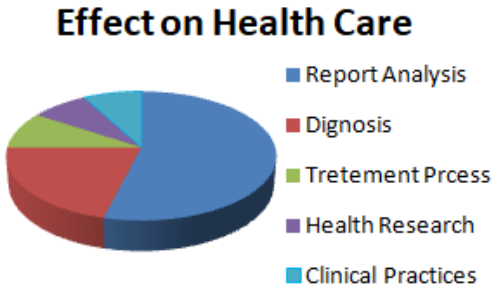
Awareness of AI based Technology used in Healthcare Processes

As the graph shows the rate of healthcare center's as have implanted technologies for handling the healthcare issues for their patients, get the better result in it, as per now a day's health complications. A view of 210 Healthcare experts & trainee was also taken in order to see A.I. based current tools awareness amongst them through questionnaire and it was found that 82% experts & trainee know the use of A.I. Machines for their patient's better healthcare and treatment process. Of which 68% experts are using the same A.I tool & machines for improving their productivity.



Effect on the Healthcare Area due to lack of sufficient I.T. Equipments

Based on the collected set of data, it is very much clear to state that, Innovative Technologies give effective solutions to the HealthCare Sector. Due to any certain reason, the lack of such resource will impact majorly on many sector of the Healthcare which include Report Analysis for the Patients, Effective Diagnosis Approach, Advance Treatment Process for the Diseases & Patients Health, Unavailability of the System for Health Research & practitioners.



Usability of A.I Technology in Treatment Process

This study shows due to the use of A.I tool amongst the healthcare experts & trainee for their patients assessment is surly improved & after using it, the results are indicate as it is more efficient approach, which inter increase's their productivity. Based on the current study, it is true that with help of A.I tool & machines, the healthcare experts & trainee can manage their treatment process effectively, which will lead them to positive grow on human healthcare.

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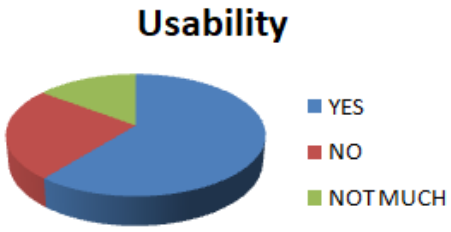
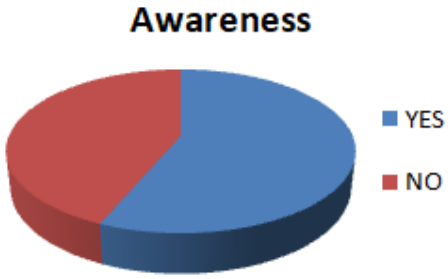


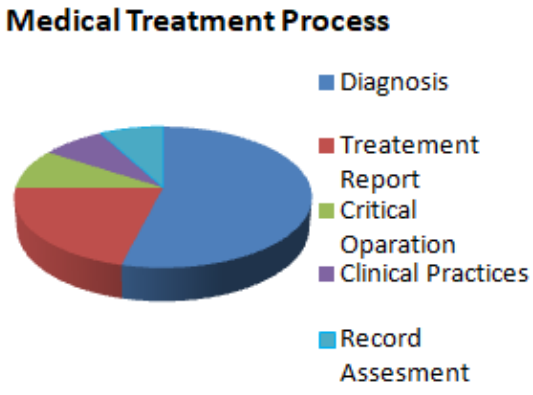
Awareness of Government Schemes or Initiatives for A.I Implementation in Healthcare

The study also states the Awareness of the Government schemes Initiatives for A.I Implementation in HealthCare, is approximate of 56.22% of healthcare experts & trainee that uses it on their domain and for the other treatment related works. The graph depicts that 43.88% of the healthcare experts & trainee are unaware and don't know Initiatives solution that are being implemented and supported by the government. Most of the local healthcare practitioners are doing their treatments by their traditional approach. Even the large portion of General people, are not aware such Initiatives in the Healthcare Domain.



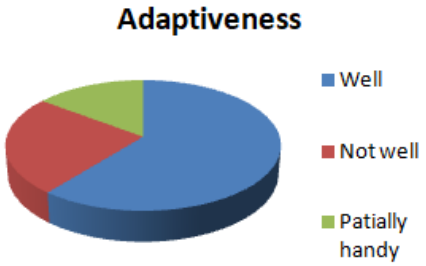
Medical Area's to implement A.I

Based on the current survey information, it is stated that 68% of the people are tends to follow A.I. machine & tool usage, Approach for their treatment process in the healthcare sector. As of 12 % of them are go for the Treatment Report and Critical Operation for that domain, approximate 25 % of them follow both Diagnose & Clinical Practices type of approaches in order to handle their patients health. An 19% of them use's it, on the Record Assessment part of it.



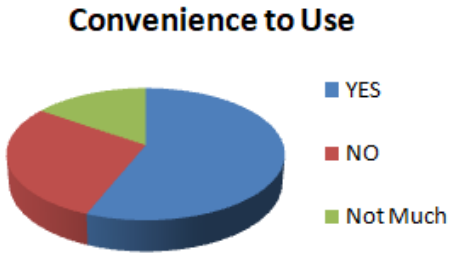
Adaptiveness of New Technologies for Daily Clinical Practice

After this study, it is show that about 55% of them are very much convenient to use & easily adapted to new technology treatment process. As approximately 35.77% of them are not convenient to use those, A.I. tools & machines to handle their patients health. Also there are about of 14.33% of them are not much sure whether A.I. is convent and handful for their work.



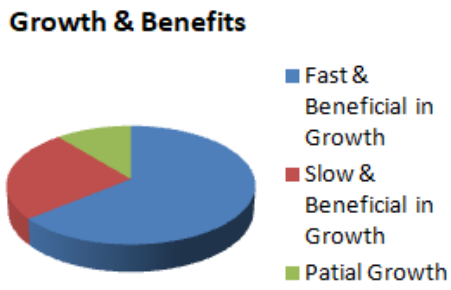
Convenience on the usage of A.I. based System

After this study, it is show that about 55% of the people are very much convenient to use & easily adapted to new technology for their agricultural waste. As approximately 35.77% of the people are Not convenient to use those new tools & techniques of ICT to handle their agricultural waste. Also there are about of 14.33% of the people are not much sure whether ICT is convent and handful for their work.



Future Growth of A.I. in the field of Healthcare

This study shows, over the period of time as the advancement of the technology is increase, which results in better and more efficient A.I. tools & technology, which came into existence. Due to this significant growth, it will allow local Hospitals, Research Center, Manufacturing Industry and many Healthcare bodies for a better treatments process.



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Conclusion and Suggestions

AI technologies are being used or trailed for a range of purposes in the field of healthcare and research, including detection of disease, management of chronic conditions, delivery of health services and drug discovery.

After understanding the importance of Advance Technologies as, how they are contributing in the HealthCare Domain, Some current factors are require to state, As per the current study it is found that, many healthcare experts & trainee are still not well aware with the current Government schemes or Initiatives for A.I Implementation in HealthCare. Even though the Healthcare professionals who are aware, are still not be able to adopt the current HealthCare Tool & Technologies, due to the lack of knowledge in operating these technologies effectively, which is used for HealthCare Treatments process.

This can happen by the, stated reason:-

- The first hurdle comes from the regulations. Current regulations lack of standards to assess the safety and efficacy of AI systems.
- The second guidance justifies the use of real-world evidence to access the performance of AI systems.
- As once an AI system gets deployed after initial training with historical data, continuation of the data supply becomes a crucial issue for further development and improvement of the system.
- Lastly, many of the practitioners are not well equip with the require Tools & technologies for the effective treatment process of their patients.

The Government and many non-profit organization has to look into the ground level implementation and their affect in healthcare domain by spreading the awareness of essentials Equipment, standards and the current innovative Technical solution on Healthcare Doman.

References

1. Rao P. AI and healthcare technology in India: opportunities, challenges and emerging trends. 2018. https://healthmanagement.org/c/healthmanagement/issuearticle/ai-and-healthcare-technology-in-india-opportunities-challenges-and-emerging-trends
2. By GCREDDY “Healthcare Domain Knowledge”, May 2018 https://www.gcreddy.com/2015/06/healthcare-domain-knowledge.html
3. Sam Daley “Surgical Robots, New Medicines And Better Care”, September 2019 https://builtin.com/artificial-intelligence/artificial-intelligence-healthcare
4. Meruja Selvamanikkam “Introduction to Artificial Intelligence”,, August 2018 https://becominghuman.ai/introduction-to-artificial-intelligence-5fba0148ec99
5. W. NICHOLSON PRICE II “Risks and remedies for artificial intelligence in Healthcare”, November 2019
6. https://www.brookings.edu/research/risks-and-remedies-for-artificial-intelligence-in-health-care/
7. Lateef Z. Implementing Artificial Intelligence In Healthcare. 2019. https://www.edureka.co/blog/artificial-intelligence-in-healthcare/
8. Wilson T. AI and robotics are transforming healthcare. 2017. https://www.pwc.com/gx/en/industries/healthcare/publications/ai-robotics-new-health/transforming-healthcare.html
9. By TECHNOFUNC. Sectors of Healthcare Industry. 2013. http://www.technofunc.com/index.php/ domain-knowledge/healthcare-industry/item/sectors-of-healthcare-industry
10. Study.com. Health Services: Definition Types & Providers. 2019. https://study.com/academy/ lesson/health-services-definition-types-providers.html
11. Lewin J, Balser J. Commentary: Healthcare leaders must embrace, advance AI. 2019. https://www.modernhealthcare.com/opinion-editorial/commentary-healthcare-leaders-must-embrace-advance-ai
12. Panch T, Mattie H, Celi LA. The ‘inconvenient truth’ about AI in healthcare. 2019. https://www.nature.com/articles/s41746-019-0155-4
13. From Nuffield Council on Bioethics. Artificial intelligence (AI) in healthcare and research. 2018 https://nuffieldbioethics.org/assets/pdfs/Artificial-Intelligence-AI-in-healthcare-and-research.pdf
14. LaRosa E, Danks D. Impacts on Trust of Healthcare AI. 2018. https://www.aies-conference.com/2018/contents/papers/main/AIES_2018_paper_132.pdf
15. Reddy S, Fox J. Artificial intelligence-enabled healthcare delivery. 2018. https://www.researchgate.net/publication/329380705_Artificial_intelligence-enabled_healthcare_delivery
16. Topol E. Preparing the healthcare workforce to deliver the digital future. 2019. https://topol.hee.nhs.uk/wp-content/uploads/HEE-Topol-Review-2019.pdf
17. Patel A. How Artificial Intelligence and Robotics is Transforming Healthcare? 2019. https://www.botreetechnologies.com/blog/how-artificial-intelligence-and-robotics-is-transforming-healthcare
18. Majidfar F. Automation of Knowledge Work in Medicine and Healthcare: Future and Challenges. 2017. https://pdfs.semanticscholar.org/341c/bdb3827ae8004cf1d80ae8df401f62541edb.pdf
19. Shah R. How Artificial Intelligence (AI) is Poised to Address Healthcare Business Problems. 2019. https://www.osplabs.com/insights/how-artificial-intelligence-ai-is-poised-to-address-healthcare-business-problems/
20. Manchanda A. 5 Problems Which Healthcare Technology Can Solve for a Healthier World. 2019. https://www.

ISSN: 2456-1398
DOI: https://doi.org/10.24321/2456.1398.202003

netsolutions.com/insights/5-healthcare-problems-which-digital-technologies-can-solve-for-a-fit-and-healthy-world/
21. Baker P. Three technologies to prevent medical errors and add important data for analytics. 2015. https://innovatemedtec.com/content/three-technologies-to-prevent-medical-errors-and-add-important-data-for-analytics
22. Matthews K. Preventing Medication Errors With Technology. 2018. https://healthcareinamerica.us/ preventing-medication-errors-with-technology-d664bf4e66d1
23. Kaushal R. MD, MPH; Kenneth N. Barker, PhD; David W. Bates, MD, MSc. How Can Information Technology Improve Patient Safety and Reduce Medication Errors in Children's Healthcare? 2001. https://jamanetwork.com/journals/jamapediatrics/ fullarticle/191018
24. By IPRO. 5 Ways Technology Has Improved Healthcare. 2015. https://www.ipromedia.us/5-ways-technology-has-improved-healthcare/
25. Paul Y, Hickok E, Sinha A et al. Artificial Intelligence in the Healthcare Industry in India. 2017. https://cis-india.org/internet-governance/ai-and-healthcare-report
26. Davenport T, Kalakota R. The potential for artificial intelligence in healthcare. 2019. https://www.rcpjournals.org/content/futurehosp/6/2/94.full.pdf

ISSN: 2456-1398
DOI: https://doi.org/10.24321/2456.1398.202003