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Vellore Institute of Technology, Vellore

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PREFACE

"Research" is the key word that should be normalized among students entering Engineering studies invariable of their major or branch of study. Students who aim at a brighter career prospect should involve themselves in exploring possibilities of finding something new or upgrading features in the existing technologies. Firstly, they should be exposed to various theories that underlay inventions and discoveries and should gain comprehensive acquaintance with these engineering marvels. The knowledge gained from theoretical perspectives will lay a strong foundation for their empirical studies, help them to shape and develop new technologies that will serve the need of the common people.

With an objective to expose students towards theoretical research in recent technologies, the following topics were suggested and the each student was allowed to choose any one topic from the suggested topics.

- Artificial Intelligence at health care Industry
- Drone Technology for life saving activities
- Embedded technologies for Hospitals
- Energy Efficient Technology for day-to-day life
- Business Intelligence

The students collected the resources from authentic open access journals related to their chosen topic. The gathered information was tailor made in the form of a research paper with standard straplines. The whole process was guided systematically during the classes and fine-tuned by the editors soon after the plagiarism check. This initiation will not only add value to the student's resumes but also it will trigger interest in research and innovation.

The success behind this special issue of the journal is purely because of the student's interest in exposing themselves to research and their commitment to accomplish the same. My sincere thanks and gratefulness to the international editors for their tireless work and investing their personal time in grooming this research work. This project is made feasible only because of VIT's vision "Transforming life through excellence in education and research" and it's a blessing for teachers and students to be a part of this great institution.

Editor-in-Chief

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Aim & Objectives

Academic Excellence in research is continued promoting in research support for young Scholars. Humanities, Arts and Science of research is motivating all aspects of encounters across disciplines and research fields in an multidisciplinary views, by assembling research groups and consequently projects, supporting publications with this inclination and organizing programmes. Internationalization of research work is the unit seeks to develop its scholarly profile in research through quality of publications. And visibility of research is creating sustainable platforms for research and publication, such as series of Books; motivating dissemination of research results for people and society.

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DRONES – THE FUTURE 911

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Introduction

In today's world, we can see an incredibly rapid increase in the development of technology. It seems to have a great effect on culture, and it also tells us how it impacts learning. These technical advances have made learning more enjoyable and efficient. That helps us to concentrate on one of the several rapidly developing technologies, 'Drone.' So here comes the question, what is a drone? And how does it help us in day to day activities?

Dennis Shiao..et.al, (2019) **"A drone is an automated aircraft robot that can be remotely controlled or fly autonomously by software-controlled flight plans in its embedded systems."**Drones have mostly been identified as objects that the government employs to spy on in recent years, which clearly shed a negative eye on this device that has the ability to save lives. Since these machines have entered the field of science and commercial use, Drones are no longer just reserved for the prime adventurers but their function has increased. Many organizations are looking forward to make the full use of the capabilities of these devices. Drones can be used in various ways with different purposes such as healthcare purposes of transporting medicine, inspecting power lines, for tall structures buildings, helping of specific electromagnetic sensors, filmmaking, etc.

Cavallone, E, (2018). Drones can be a life-saver in times of disaster. Drones can be used by fire services to detect and monitor wildfires, drones provide an exceptional means to easily identify lost persons. In the aftermath of natural disasters, a drone can be used to help find and save the lives of people. Drones may also be used in a crisis zone to collect and distribute medical samples, equipment, and medicine to isolated or otherwise inaccessible areas.

Naveen Joshi, (2019). Needless to say, drones can be extremely useful devices. But there are obviously a lot of pitfalls here and I personally believe there is also a significant advancement for this technology when we realize that the application of this product is unlimited, which also means that a threat will be used in the future as well. One considerable downside to the development of drone technology is its weakness. Hackers can target the central control system of a drone easily and then become the new operator of the drone. The key control mechanism contains vital information that is necessary for hackers to escape without the awareness of the original operator. Hackers may access personal data from unknown third parties, damage or destroy files, and withhold the information for extortion. But, according to the engineering firms, they are seeking to develop in this field because this can potentially be risky. Significant changes to the monitoring systems are being made and the focus is on their security measure. Tech researchers are working to make sure that the control systems are malware-resistant and cannot be quickly compromised. New and more effective control systems are being developed in addition to this.

Literary Survey

1. Balasingam, M, (2017). Drones have proven to be of great help in disaster-struck areas where other means of deliveries have failed, this is due to their ability to soar without the help of any driver and the compact shape and size which enables them to land on any surface. They are being used to deliver test samples, aid packages, vaccines, testing kits by

UNICEF and other major organisations. Drones reduce delivery time and are cost-effective. Drones are now being improved by the addition of special sensors and infrared devices, to a point where help would be available at the push of a button. Vignesh Santhanam,(2020)A study was recently done in Netherlands about the usage of ambulance drones for the delivery of AED (automated external defibrillator) to the cardiac arrest victims which will drastically lower the mortality rate of patients from cardiac arrests. Health Integrated Rescue Operations (HIRO) in collaboration with aviation experts have come up with drones provisioned with video-conferencing capabilities via Google Glass, which helped the bystanders in providing aid directed by the instructions from healthcare workers. Drones have been employed by stakeholders like Amazon, Google for delivery and other research objectives, guided by rules stated by EASA. Even though there drawbacks of using drones, they are being constantly improved and have shown tremendous potential for transforming healthcare industry.

2. Sandvik, K. B., & Jumbert, M. G, (2016). Drones have been incorporated in warfares, ergo they are viewed in negative light, as the non-military usage of drones has not received much attention. Drones are being used in humanitarian relief works, rescues and search, environmental and wildlife protection. Drones have aided social movements and played an important role in the protection of wildlife by keeping track of activities of individuals in national parks and wildlife reserves. Drones maximise the efficiency of relief work as they are capable of reaching all types of destination without the need for a physical driver. The infrared imaging capacity coupled with super zoom lenses has saved innumerable lives. Several acres of land can be searched in a jiffy because of drones. Atrax M, is a drone which has previously been used for rescue and has proven to be more efficient and less time consuming as compared to conventional methods. But, indeed, Drones are being employed by the military for surveillance and targeted killings which raise moral and ethical concerns. Drones also have limitations, privacy is one of the major concerns, these drones can be hacked and used for spying on citizens for immoral purpose. Legislations have been made to prevent such acts, but it is not possible to completely stop intentional misuse of drones.
3. Veroustraete, F. (2015), Unmanned aerial vehicles (UAV) generally known as drones, they can either be controlled manually or with a remote control or can be automated to follow a GPS route. Drones are being used in almost every field now, drones have brought about a revolution in agriculture and many other fields. Drones help expand “precision agriculture” - the use of modern technology in agriculture, utilization of GPS coupled with GIS, plays a key role in precision agriculture. Drones help ensure adequate fertility of the soil to ensure optimum growth and maximum yield of crops. Jeremy Jensen, (2019) Drones are cost-effective and time-efficient they provide quick solutions, by analysing the data which is highly beneficial for farmers. There has been a serious rise in farmer suicide rate because of various hardships faced by them, they are left destitute. If made accessible drones can bring down the farmer suicide rate significantly. They are also being used for livestock management which not only helps the farmers but ensures the safety of animals as everything is documented, these documentations can be used by officials to ensure that animals don’t face abuse of any form. Drones use 3D maps for the analysis of soil, they are not only capable of monitoring crops but are also efficient in crop spraying by determining the right ratio of chemicals, which also makes the yields less harmful for consumption, they have led to the drop of herbicide usage by 52% (According to a case study done in Brazil in 2019). Drones in agriculture is a quickly evolving industry.
4. Skorup, B., & Haaland, C, 2020). Quarantine, social distancing words which we have become acquainted with in the past few months due to this wave of coronavirus. Despite imposing lockdowns

and travel restrictions the virus is spreading at an alarming rate. Drones can be of great help in this situation. They can be used to reduce human contact further, as they are proficient in making deliveries to any area be it urban, rural or terrains. The US has conducted a series of tests to check the efficiency of drones in performing the assigned tasks. Many countries like China and Africa, have begun using drones to abet in the public sector, and to make deliveries. They are also being used by hospitals and labs to bring COVID -19 samples, which has made the testing process more time-efficient and reduced the spread simultaneously, these drones can also assist healthcare workers by monitoring the patients and recording their details which will give an elaborate idea about the condition of the patients. In India drones monitor the activities of people and ensure that they abide by the imposed laws, but surveillance of this form has raised concerns over privacy. Agricultural drones are being used for sanitization of public places, they cover more area in less time. Many countries have used drones as a medium to raise awareness about the virus, either by broadcasting news, precautions on the screen or with a speaker. Drones have become a necessity to help combat the spread of COVID-19.

5. Restas, A, (2018). We have scarce resources, and an overwhelming number of people consuming these resources. This problem is highlighted in times of adverse conditions like disasters, humongous amount of people are affected but due to limited number of relief providers many people lose their lives. Drones have solved this problem in numerous ways as they cater to a large number of people in a shorter period of time. The annular view of drones has helped detect several fire hot spots and prevent forest fires, the time taken by these drones is negligible as compared to conventional methods, ergo saving resources as physically inspecting such large areas would require lump sum of money. Drones can be used to take pictures of dams, basins and flood barriers which can later be reviewed by experts, and preventive measures can be taken. Drones also help in management of these disasters by providing first aid kits and other equipments necessary for survival, they can also track people who need rescue, due to motion sensing properties. Drones can be used re-map the areas hit by floods etc. Even nuclear accidents can be prevented by use of drones and active assessment. These disasters claim thousands of lives every year if used efficiently drones have the capability of minimising these disasters and their aftermaths.
6. Scott, J., & Scott, C, (2017). Health is the prime priority of any country. Constant advancements are being made to ensure well-being of individuals. Delivery of Vaccines, medicine, blood samples, defibrillators are few demands that a drone can fulfil in healthcare industry, this is done using GPS. The first drone ever used for delivery could move up to 1Km and carry lightweight objects, since then innumerable updates have been made to increase the efficiency. Advanced drones can now fly up to 73Km in 30 minutes. Transportation time taken by drones is very short, which increases the probability of saving lives, especially in cases of cardiac arrest. One such drone is MD4-100,by micro drones, it has saved numerous lives by providing timely services which otherwise cannot be made available due to physical limitations. Laksham K. B, (2019). Drones can be used for transportation of blood, for transfusion, from blood banks. In rural areas blood banks are scarce, these drones can be beneficial in such areas. Delayed diagnosis is one of the major causes of death in rural areas, with the help of drones diagnosis can be done quicker and medicines can be immediately transported. Organ transportation for implantation is a very tedious process, and with traffic, the probability of the organ reaching on time is negligible, drones can carry these organs 10X faster (According to UNFPA) without any damage. Drones similar to robots can be used for guidance and support of elderly people. In this rapidly growing world drones have now become a necessity rather than a luxury.

Limitations

1. The efficiency of the drones is dependent on the weather, in unfavourable weather conditions the information gathered is erratic.
2. Drones are vulnerable to attack by hackers, hence putting privacy at stake, prone to attack by virus.
3. Utilization of drones in multiple fields will eventually lead to widespread unemployment.
4. They are not cost effective, the price of these drones is twice as that of traditional aircrafts.
5. There are no guidelines regarding the usage of drones at present, making them perilous in situations of war.
6. Drones require batteries to function, which limits their usage and makes them unreliable in critical situations.
7. Drones hover and keep a track of activities by taking pictures, this could be viewed as invasion of privacy.
8. Different drones serve different purpose and thus need to be trained in accordance to that purpose which further increases the cost.
9. Using drones requires complete understanding of it's features which cannot be acquired by everyone.
10. The transmission speed of drones is not very high, giving rise to a 0.5 probability of success.

Conclusion

Drones are currently employed by Indian military to record the movements near the border, they are being used in development of infrastructure, aerial mapping. With a major part of India's population practicing farming these drones could solve most of their problems related to insects, especially locusts by spraying insecticides in wide areas in a short time span. The traffic jams can last for as long as days at times in India, drones can solve this problem in a jiffy. The most common application of drone is delivery, which can be used by common people. They can assist police officials in crime investigation to speed up the process, thus reducing the crime rate. While drones are capable of solving a fair share of our problems, the cons are vicious. Drones can be used but only with imposition of restrictions, to avoid any dreadful situations. As it is said "Better safe than sorry", the usage of drones in wars will lead to huge devastation.

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DRONE – THE PRESENT AND FUTURE

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Introduction

Elizabeth Howell., et.al, (2018) Drone (Dynamic Remotely Operated Navigation Equipment) is an unpiloted flying machine. Many synonyms are used to mention drone. One of the terms used Unmanned Aerial System (UAS) guided by remote control. Drones are made from different light composite materials in order to increase strength while flying and reduce weight. They can be equipped with a variety of additional equipment, including cameras, GPS, navigation systems, sensors, and various other drone software and hardware. Drone is a machine where there is nobody on board that can fly autonomously. Based on the types there are aerial, ground, submarine drones. Further aerial drones are four types there are Multi Rotor Drones, Fixed Wing Drones, Single Rotor Helicopter, and Fixed Wing Hybrid VTOL. Drones are designed in different shapes and sizes accordingly to complete the needs of the people. Drones can be used for various health purposes such as finding survivors after natural disasters, delivering medicines or providing first aid care in emergency situations. Drones are also used as helping hand to solve the medical industry's most difficult challenges. The word "drone" is commonly associated with the military. Drones are used mostly in army areas where people don't want to put the person lives such as pilots in threatening risks and instead use drones to supply the required equipment's to the human in need. Also nowadays, drones are tested for commercial delivery of goods or building inspections. Zehra Akbar., et.al, (2020) The present 2020 year brought a huge undreamt situation for each person in the world which leads to various emergencies. Just in the last few months and also at present, drone technology has supported the fight against COVID-19 by sanitizing outdoor surfaces, delivering or providing test kits. Drones are the best way to approach the people at this present pandemic. Historically, first responders have relied on ambulances, helicopters, and even boats to fulfil the needs or emergencies during natural disasters, but drones can help fill the gaps where the activity needed to achieve fails. Live stream footage from drones also helps to spot any injuries, violence, or issues in real-time and inform the response. Artificial intelligence is applied to these applications; drones can be even more impactful. In the complete document we will come to know various activities done by the drones. Before that we should also take a step to bring awareness among the people who are not aware of drones. They should come to know every detail about the drone. This helps them to attain general information about the drones and in which way it can help them. It plays a very important role at the present pandemic. Thus, drones have become very essential in the present scenario.

Literary Survey

M. Balasingam., et.al, (2017) Nowadays the drones are playing a main role in healthcare services. Drone is a new scope of technology. The use of drones is taking major part in many aspects. Excluding aerial drones recently ground drones have also been popular and also they have been installed with artificial intelligence. A drone plays a vital role in military services. The real heroes of our country give their lives leaving their families and protect the nation. The people in the forces should be protected so drones are the vehicles which can reach in no time to the person injured and also fulfil the requirements. Coming to the health care industry, it made the best

usage of technology through drones. The main role of drones in life saving activities is stock of supplies during disasters. They provide first aid kits, medicines and blood. For example, at present spreading disease such as corona has brought the drones in transportation of test kits, test samples. In case of cardiac arrest and breathing difficulties, oxygen carriers and external defibrillators are used with the help of drones. On account of these widespread applications drones have found their significance in the field of medicine and health care in 21st century. Drones can be hand thrown and launched from a launch pad. They can land on different terrains and can adjust with different conditions of weather and climates. They can fly in all the directions and can drop required materials from a very small height. Restas. A., et.al, (2018) In case of drought amount of water is below required while in case of flood amount of water is too much but both of them can mean disaster. With a high resolution mapping it can give precisions data about the flooding mechanism and the flooded area. Drone can re-map the given area and can detect unexpected events like trapped people in houses, drowning people at the flooded area or water leakage at dams or flood barriers. With drone applications fire service can detect hot spots earlier than the traditional civil report. Yunus Karaca., et.al, (2018) During disasters such as tsunamis and forest fires the affected regions are difficult to access by humans. In these situations, drones reduce the risk of death or injury to the rescuer. Drones can be used to scan a large region within a short time span. Not only humans but other lives can also be saved. Drones can be used to monitor farming lands during emergencies and domestic animals and pets can be saved. The drawback of drones can occur due to weather condition. However, Swarm Search Strategy has been introduced for proper navigation and for the determination of the exact location. In missing cases, drones with computer vision can be used to trace them back even in larger gatherings. Konert. A., et.al, (2019) The analysis showed no change in platelet count, haemolysis of Red Blood Cells and in blood pH level. Red Blood Corpuscles and certain platelet and plasma units which were frozen for 24 hours from the time of collection were kept in a cooler and carried for a time period of 26.5 minutes through different temperatures ranging from -1 to 18 degree Celsius. From this we can infer that drones could be a better option for the purpose of transportation. The first usage of Drones was in the effects of an earthquake in 2010 in Haiti. In 2015 drones were used by rescue services to deliver life jackets to people who were stuck in the Little Androscoggin River. Pankaj Pathak., et.al, (2019) Drones have been a handy gadget to get Ariel photography for many years and used for intelligence and anti-terrorist outcomes. Today the drones are much more flexible and are moving the industry forward in its reach for activities. There are other types of drones too such as boats, submarines. Presently Federal Aviation Administration (FAA) is already taking steps to enable these advanced operations. The FAA recently introduced the Tactical beyond Visual Line of Sight (TBVLOS) waiver for first responders to fly drones beyond visual line of sight in extreme emergencies. From a safety perspective, navigating the airspace can be a discouraging task for any organization, but Sky Grid makes it easy to execute emergency response drone missions. Laksham. K. B., et.al, (2019) Drones can provide important medications like antidote for a snake bite or a dog or animal bite. Organ transport needs to be very fast and it can be achieved with the help of drones. Also, drones were very successful in the field of Environment and Ecology. However, drones need proper infrastructure and well trained and equipped individuals for monitoring. Drones can be evaluated by observing their strengths, weaknesses, opportunities and their threats. The strength of drones is that they are time saving. Drones can be operated in different landscape such as mountains, deserts, oceans and also in snow covered regions. Usage of drones requires well trained professionals who have to completely monitor from the ground, which is a weakness as there can be human error. Proper infrastructure like a

proper runway is required. Drones cannot carry heavy payloads like planes and helicopters. In developing countries like India drones can transport blood and organs for operations in a hospital which is an opportunity. Due to drones, air traffic can increase and accidents can occur and affect the people on ground which is a threat. The strength of drones is that they are time saving. Drones are relatively cost effective than normal road transport in difficult terrains.

Disadvantages

1. Drones are mostly used for large farms because they cover a huge area which is a disadvantage of drone in the case of the small farms.
2. There are no guidelines regarding the usage of drones at present, making them dangerous in situations of war.
3. Only a restricted amount of weights can be carried by the drones. It cannot carry a huge amount of loads required for the people in need.
4. They are not cost effective, the price of these drones is twice as that of traditional aircrafts.
5. A person who is well trained can only operate the drone in the right direction and also in some cases a launcher is needed to get the drone into the air. Drones can cause accidents due to their sharp blades.
6. Drones require batteries to function, which limits their usage and makes them unreliable in critical situations.
7. The drones cannot be travelled in all the weather conditions. The efficiency of the drones is dependent on the weather, in unfavourable weather conditions the information gathered is erratic.
8. Drones are unprotected to wild animal attacks and have a high risk of crashing against a tree or with some creatures such as eagles.
9. Drones are vulnerable to attack by hackers, hence putting privacy at stake, prone to attack by virus.
10. Drones hover and keep a track of activities by taking pictures; this could be viewed as invasion of privacy.

Conclusion

Governments have received a very good position in selections of drone in different aspects. Where other governments included themselves in use of drone in health care and others upheld private engineers to improve drone. Drone gets applied in health care is evident for funders to invest. Fast advances in drone research and assists make it almost certain that drone will be utilized widely in health care convenience. As governments put resources to organise drones in the health care can assure changes with careful arrangements. Drone technologies are useful for countries like India in various ways. The Indian Government use drones in different aspects like agricultural purposes such as crop health monitoring, soil health assessment and improved resource utilisation. For Urban Development purposes such as city survey, project quality assessment, project monitoring and improved urban planning. And it can also be used mainly in the traffic management such as traffic feedback, road surface condition monitoring and improved traffic management. Drones are also employed by Indian military to record the movements near the border, they are being used in development of infrastructure, aerial mapping. With a major part of India's population practicing farming these drones could solve most of their problems related to insects, especially locusts by spraying insecticides in wide areas in a short time span. New technology once expanded and used, it cannot be unexecuted, and becomes a matter for society to exercise wisdom and apply good management.

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ARTIFICIAL INTELLIGENCE AT HEALTH CARE INDUSTRY

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Introduction

Nilsson, N. J., Morgan Kaufmann. (2014) We as a human being have always showcased our competence while managing various tasks by our sheer intelligence be it making computer programs, developing databases, mathematical problems, or even driving an automobile. As many of my readers would acknowledge the fact that in recent years many computer systems have been designed for carrying out such tasks. These systems have even set benchmarks when it comes perform tasks such as diagnosing diseases, solving differential equation in symbolic form, understand limited amount of natural and human speech, or even write small computer programs to meet the industrial demands. All such system posses fair amount of **artificial intelligence**. The field of artificial intelligence surrounds itself by making such types of systems starting from a loosely structured body it develops with the help of advance computation technique thus giving this field a wide range of application.

Vibhuthi Viswanathan (12/04/2018). The scope of AI is probably one of the brightest when compared any other form of technology. Automation using AI for drug discovery is a field where growth is at par, mostly because machines work faster than humans. It is applied to related areas such as synthetic biology which again has a good growth rate in future. Its day to day application includes cyber security probably one of the most important aspect a industry looks into given the amount of information a database has, face recognition again for increasing one's security to his/her private information and it can even recognize a person mental condition in the near future, data analysis, transport – self driving cars have already started to create a buzz around the tech community and MNC's such as Uber, Google, are already working on it at a very fast pace, emotional bots, etc. Every coin has two sides to it's a me goes with AI it also faces with certain risks with the most discussed one is the risk of decline in the job market due to automation which will leave the manufacturing part of the industry with robots and machines, driver-less car will result in the loss of job for the drivers, less jobs in core fields which already is being seen in the present world. The good thing about all this is that we are aware of the risks which can make us think at our best to reduce them and thus making AI as one of the most sought after technology for the healthcare industries and for the whole world.

Literary Survey

Bajpai, V. (2014).Healthcare in itself is a vast area to look upon with its pros and cons. While the sector has growth exponentially over the years it still has a far way to go with rising medical cases, high cost treatment and even when the cost is less in public hospitals it suffers from lack of proper infrastructure. Some of the prominent authors have even described it as "monuments to disease" due to their function as institution only for curative care, detached from the larger social, economical, cultural, and political context of the people's live which are the main factors of an individual's health. It also lacks in manpower for instance in India some states had even 0.3 doctors per 10,000 of population which is far behind the WHO defined 1 doctor per 1,000 population. There is also an unmanageable patient load in some countries due to overcrowding in hospitals, lack of outreach, etc .The graph clearly

represents that we need to think upon our healthcare industry efficiently. Jiang, F. et.al.(2017) Artificial intelligence has sent vast waves across the healthcare in recent time due to its wide range application. AI has even started a discussion whether AI will assist physicians in certain medicinal areas like radiology. AI can use advanced algorithms to learn and adapt a wide range of healthcare data and even can improve itself when equipped with self- learning abilities. It can also help to reduce diagnostic errors that are inevitable in human clinical practice. In the initial developing stage AI has to be feeded with data obtained from clinical practice. AI literature analyses data from diagnosis imaging, genetic testing and electro diagnosis. AI first converts the unstructured text machine-understandable electronic medical record and then analyses the data for further uses. It has various sub parts according to its use in treating diseases by natural language skills, analytical skills, etc. It can also detect a disease before its arrival with the help of already provided symptoms of it in its respective database. For instance stroke, for 85% of the time happens due thrombus in the vessel called cerebral infraction, it was provided with two ML algorithms which help to pre-detect the cause and thus preventing strokes.

Khanna, D. (2018). Every system that uses AI has an advantage of completing the task in a smaller amount of time. Earlier it used to take many years to accomplish your research in a proper and efficient way but with the advent of AI it has become smaller. For instance developing pharmaceuticals using clinical test method will require many years and a huge cost and manpower therefore by using AI as a tool it can accomplished quicker, cheaply, and with a less manpower. It can also be used to draw back a data used earlier for a system with the help of its stored database but it cannot be used at all the times rather it performs the task of assisting the humans to find the drug which could be potential medicine tomorrow. Its huge application lies in its data management structure which stores and collects medical data of various essential experiments which can be used at any time for any part of population in the world. It also impacts the cost of healthcare treatments which can fall down with the positive usage of AI in the medical field. It can increase the accuracy of treatment by again analyzing data of where we went wrong last time and what we did to make the treatment efficient. Overall it has positive impact on the doctors and healthcare workers and patients around the world and it is still in the progress making its future bright and something to look forward to.

Longoni, C.et.al.(2019) AI is revolutionizing healthcare industry and is predicted on the premise that it can perform with expert level accuracy and deliver cost effective treatment at ease to its patients. It can even outperform humans at some point. For instance IBM's Watson performance when compared to humans for 1000 cancer diagnoses samples doctors where fount to be correct 77.5% of the time whereas AI reached an astonishing accuracy of 90.2%. Yet it all boils down to the patients whether they are ready for bringing a change the way they are treated and how they adapt to the system that is one major drawback of its outcome that humans still do not trust automation to treat them it can improved by making them realize its positivity and accurate and cost effective outcomes. The belief that machines treat every human in the similar manner without any emotional conduct bring a positive impact but it can be argued that an AI cannot emotionally connect with a patient like a doctor does which has its positive and negative impacts but it helps the patient to trust the system which is still missing from the AI. Yet we need to be positive about the change and believe in AI strandadized approach with an open mind without any egoistic and immature reasons then we can establish a healthy relationship between the AI and the patient which is very important for the future. A study showed that 1 out of 4 patients trust machines and AI to treat them which is the figure everyone would like to see a improvement in.

Topol, E. (2019). AI has made the future exciting by how AI will turn out to be in the long run this isn't to say that it will replace humans it only will provide us with is a recommendation, one that is

perhaps more accurate than it ever has been but it will take care, believe and technological advancement at its best. Over 2000 years ago Hippocrates said, “it is more important to know what sort of what person has a disease than to know what sort of disease a person has.” Or even with all the big data that we have it will depend as much on wise doctors a well. So the combined effort of AI and humans could result in a medical triumph which we all want to be a part of. AI is sneaking into our lives it has already automated cars, televisions, even predicts our likings and suggests us based on it, to alexa answering us with just our voice. Its history is not so good with many failures and untrustworthy decisions but now it has started its positive journey on a very high note. Many countries are trying to build healthcare centers which comprises of full automation with the human effort it already has made us efficient to perform certain task which was predicted to be impossible like artificial body parts, painless operations, predicting one’s health condition with great accuracy, etc.

Cavallone, M., & Palumbo, R. (2020).Artificial intelligence and digitalization are revolutionizing the design and the delivery of care. They have enhanced health services' quality and effectiveness and have paved the way for more direct patient–provider relationships with addition to that they have been argued to allow a more appropriate use of available resources.

There is a dark side of it involving both management and ethical issues. Management issues being corrupt practices which can follow up with advent of AI like selling of the technology in the wrong hands which can lead to very bad consequences in healthcare industry like deficient of resources. Unprescriped use of AI to fill the needs of the evil deeds this can be improved with the help of an efficient management team in the healthcare industry which comprises of honest and rule driven people. Ethical issues include unawareness of right and wrong which again should be looked into properly.

Advantages

1. Artificial Intelligence helps the healthcare industry by reading and analyzing the data of the patients/clinicians by smart algorithms thus reducing the pressure on the industry of managing huge amount of raw data.
2. In areas where human resources in form of medical treatment are low AI can help to diagnose patients with even sometimes with more accuracy.
3. AI can predict errors and make predictions on designs and working of medical instruments which improves the working of the instrument.
4. AI and man power can work together to improve the output of the treatment and overall the healthcare industry.
5. AI can improve the security of the patients databases as time passes because breaching the system would get complicated over time.
6. AI will improve the honesty in the healthcare industry as it will be more regulatory and rule based than the human being thus increasing the efficiency of the healthcare industry.
7. AI will lower the cost of healthcare facilities as their use will eliminate major cost generating administrative processes and thus expanding their availability to the masses.
8. AI devices like Fit Bits, smart watches, would predict health issues of the individuals before it takes a serious form and thus it will reduce hospital visits and cost.
9. AI can cover a wide range of area when surveying a large amount of data for improving the healthcare and thus can understand the people views better.
10. The productivity of AI working in healthcare will increase as time passes as AI and human working together will improve the industry.

Conclusion

Artificial Intelligence without a second thought would be a world changing effect. AI is among the most discussed topics right now and the big technological companies have already started to predict a huge increase of it in the upcoming future,

affecting everyone directly or indirectly, it already has started to affect our daily lifestyles including our healthcare industry like automation of machines which help the physicians during critical moments, it is cost efficient, covers rural areas where facilities are not available freely, increases productivity, increases the efficiency, it can collect large amount of data and do analysis on it, and the partnership with it would surely improve the healthcare facilities. Now as every coin has two sides to it, AI also has its cons which are also important to ponder upon as these are the challenges to the industry and needs to be worked upon and if they are removed from the curve our healthcare can attain an immune status. One of the biggest debated topics is security, given the fact that cyber hacks and breach are now frequently happening in the industry with even the biggest technological companies like facebook, twitter getting problems with their security, even NASA has been breached a number of times which probably has one of the best cyber security systems in the world. All these things have started to question the security of AI and how it will manage a huge amount of data without any breach. Other problem is the decrease of employment in the healthcare sector because of the automation bought up by the AI. A major physicist like Stephen Hawking has often said that the advent of AI could lead human to fight for its existence with their own creation. Another issue with AI has been its effect on the emotional connection which a patient has with the doctors and health workers, no matter how much realistic we try to make AI but the emotional connect would surely be missing. Even though it faces major drawbacks but the positives of it out weights the negatives making it a sector on which heavy research and thinking is going on and we humans have a keen eye for its arrival. At last what we can do is hope that it changes the health care industry with the maximum positive impact and contribute our mind and thinking to its development.

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EMBEDDED TECHNOLOGY IN HOSPITALS

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Introduction

Embedded system is computer hardware system with software. It is designed to perform a specified function. It is also known as integrated system due to combination of hardware with software. Embedded technology has shown huge improvement in the medical field. Bio-medical electronic devices like blood pressure measuring gadgets, X-ray, MRI etc are examples of embedded technology in hospitals. This technology redefines healthcare by ensuring better care, improved performance and patient experience for healthcare providers.

Embedded systems are part of overall Iot (Internet of Things). Embedded systems have many applications in healthcare. They are used for monitoring vital signs, for amplifying sounds in electronic stethoscopes, in nearly every kind of imaging system, PET scans, CT scans. With help of this embedded technology, doctors can use imaging tools to diagnose the illness without performing any type of exploratory surgery. They can use the same tools to track the treatment progress.

Literary Survey

Healthcare is an important parameter of our lives. To provide effective treatment, fewer medical facilities are there to track the patient's history. Healthcare system should be optimised to make it more efficient. This paper focuses on embedded technology in healthcare/hospitals that not only analyse healthcare issues but guarantee improved healthcare services. Embedded systems allow doctors to remotely monitor health of a patient and make treatment through telemedicine and other remote systems.

The main aim of paper is to integrate embedded technology that emphasizes smart healthcare systems for monitoring of hospital system. Smooth healthcare services are provided to patients by implementation of networked information. Doctors make use of this data and provide smooth and fast solution. By this technology, effective solutions are provided to patients on a regular basis. For example, if information about patient is abnormal then he/she gets notification and caretakers will get emergency message.

Mobile physiological monitoring system is one of the proposed system in embedded technology. This is a continuous monitoring and control mechanism. It is able to monitor the patient's heartbeat, blood pressure and other critical parameters. The data of patient is stored in a server that uses Wi-Fi module based wireless communication. The future aspect is to make this system more advanced. The advancement would be the connection of more sensors to internet so that various other health parameters are also recorded which will be beneficial for monitoring the patient's health. A Wi-Fi mesh type network generation increases the communication range.

There is increase in life expectancy and the society is aging towards older. We'll focus on important issue to assure safety and quality of life. The concern here is about the design methodology of tools which can support elder people in their everyday life i.e. making easy and safe. These tools are specifically for indoor and outdoor health monitoring. The proposed system is Design Methodology (DM). It was verified with a case study of real life conditions where there is need of

supporting elder people, especially for those who live alone.

Advantages

1. Advanced networking and communication out of the box.
2. Instantaneously, vital signs can be tracked virtually.
3. Embedded systems tend to require less power and they do need much processing power.
4. Patients that are admitted in hospitals need constant attention. This will happen using medical embedded technologies.
5. Medical devices lean greatly on embedded technology as they provide aid in diagnosing and treating the health of the patient.
6. Smart embedded technology based medical devices, now-a-days are mostly in the form of wearables which allow the users to monitor their health parameters such as blood pressure, heart rate, glucose levels, weight etc. For example, they can be worn as bracelet.
7. Embedded systems help patients to treat themselves and can be used for preventative medicine.
8. Now prosthetic technicians are able to make their prosthetics more and more advanced.

Conclusion

Recent advances in embedded system technology are rapidly transforming the healthcare solutions. As functionality of these systems in healthcare increases, we can observe decrease in their size. Healthcare devices based on embedded technology are smaller and more portable than ever. We are headed to a future of smaller, smarter, wearable and connected medical devices. The above advantages are most revolutionary uses of embedded systems in healthcare industry.

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THE CURRENT AND FUTURE PROSPECTS OF ARTIFICIAL INTELLIGENCE IN MEDICINE

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Introduction

Estevez, J.et.al.(2019) Before we understand what Artificial Intelligence(AI) is, we must first get ourselves familiar with Computational Thinking (CT). It is the fundamental method of thinking that has helped us use coding and programming in computers to help us solve real world problems. It is a data-centric approach that helps simplify and solve the tasks at hand. Hence, one could consider Artificial Intelligence to be a sort of self-sufficient computational thinking. Although Artificial Intelligence has many applications presently, like search engines and self-driving cars, most of us are not completely familiar with it and its full extent of applications. Hence, the need to educate ourselves about this breakthrough technology is acutely felt. Artificial Intelligence can be implemented in mainly two ways, embedded systems (hardware and physical machinery) and virtual software (fully digital, existing in virtual space), and of course, amalgamations of the two. Besides the aforementioned, some more miscellaneous applications of Artificial Intelligence include personalized advertisements, stock market analytics, etc.

He, J., Et.al.(2019) The healthcare industry as we know it is not perfect. Different countries have implemented different versions of healthcare according to their own philosophies, but they all attempt to solve mainly 3 issues. These are: affordability, quality and universality. Affordability compares the price of medicine to the purchasing power of the general population. Quality of healthcare refers to the overall effectiveness of medical treatments currently. Universality checks whether the same healthcare services are readily available to all its citizens all over the country, even in the rural parts. Keeping this in mind, it is not difficult to predict that Artificial Intelligence could be a possible solution to all these problems. Currently, Artificial Intelligence sees some implementation in the healthcare sector, but not to its full extent. It can be further implemented in data diagnostics, to predict diseases pre-emptively based on trends in the data provided. It can also help handle complications in intensive medical procedures like surgeries and improve the survival rate of patients and the success rate of such procedures. Analysing patient demographics may help better suggest appropriate and personalized medication and medical procedures (on a case-by-case basis). Lastly, implementation in hospital administration to speed up wait times and efficiently handle patients, will also be a major improvement.

In my personal opinion, we have barely cracked the tip of the iceberg. Even with a conservative evaluation, Artificial Intelligence has endless opportunities of implementation in the field of medicine, for instance cardiovascular diseases and cancer treatment. Hence, it is imperative that we explore and push the boundaries of innovation in medicine and Artificial Intelligence, because, whether we like it or not, the two are linked. Beyond the healthcare industry, it is also important to break the stigma that rests in the minds of the non-initiated, with respect to Artificial Intelligence, for example the AI doomsday apocalypse coup-de-tat popularized by Hollywood movies. This can only be done by spreading awareness and better education with regards to the topic. Artificial Intelligence is the

future, but it will remain just the future unless we are willing to learn and spread awareness. I write this paper with this objective in mind.

Literary Survey

Jiang, F., Et.al. (2017) The basis of any implementation of artificial intelligence is learning from already existing data. Before we can effectively implement artificial intelligence in various fields within healthcare, we must, in essence, teach the software and its associated systems how to analyze and draw effective conclusions from the data provided. Today, the field of medicine has an abundance of data. Raw, multi-dimensional data, in the form of clinical and hospital records, patient descriptions, disease descriptions, medicines characterised by the specific disease they treat, survivability rates during and after numerous medical procedures and surgeries, etc. Besides this, narrative data from medical journals, research, and medical records also need to be accounted for. In order to achieve all of the above and more, we implement 3 techniques, namely Classical Machine Learning, Natural Language Processing, and Deep Learning. Classical Machine Learning is a technique by which the system analyzes already ordered, structured or contextualized statistical data. Since there are so many variables and types of data, it is nearly impossible for a human mind to effectively analyze data of such volumes and draw relevant conclusions from it. Hence, Classical Machine Learning is an effective technique to understand data. But what about narrative medical accounts, hand-written records, medical journals and other literary research work? Such data is unrecognizable to the traditional machine learning system. Hence we implement another technique called Natural Language Processing. It provides the system the capability to understand, characterize, contextualize, interact with and draw conclusions from narrative accounts from humans working in the medical field. This technique searches for relevant keywords and statistics from the data provided, and identifies links to similar cases already analysed within the database. In this way, relevant hand-written data that can be interpreted by the system is extracted and added to the database, while simultaneously making linear connections with similar cases and enriching the system's database forevermore. But what about the correlations and connections in medical data, that aren't as linear or apparent? To identify such indirect relations across large sets of data, we implement a specialised technique called Deep Learning. Hence, with the help of artificial intelligence and machine learning, we can make more accurate predictions and conclusions, even with the same amount of data known.

Holzinger, A., Et.al.(2019) Even though there have been significant advancements in artificial intelligence and machine learning, it is undeniable that there is a difference in the way humans and machines "think." What we call as common sense, is the product of years of axiomatic learning and internalizing, some maybe even subconsciously. So what makes a human statement and a machine statement so different? Humans do not use probabilistic models and data analysis as our primary decision making process. This might result in different conclusions and decisions drawn by a human expert versus a machine with relevant data, even when presented with the same problem or situation. Traditional machine learning technique has lacked such context understanding and in innovating new artificial intelligence methods, changing this has been our goal. But even if a machine and a human expert come to the same conclusion regarding a topic, what relevance is the machine's statement and methodology to come up with the conclusion to the expert? How is the expert supposed to know, why the algorithm ran the way it did, whether there's an error in the results or not. It is here that we need to draw an important correlation between explain ability and causability. Explain ability is the algorithm, logic, and any other active process the machine uses to either predict an outcome in cases of uncertainty or draws a conclusion to a specified situation based on previous data provided. Causability on the other hand is the logic, understanding and thinking based on

previous experiences a human being uses to come up with a suitable solution according to them. If the fundamental basis of processing of man and machine are different, then how are we to effectively understand and implement artificial intelligence to its full extent? The need to make an interface which converts explainability to causability, so that healthcare professionals in the industry can effectively reap as much benefit as possible is greatly felt. The first step to do such a daunting task is to understand how the probability model, or any other machine learning model works. For a specified problem, how does the output vary, if we vary the input variables. What exactly does the model consider relevant information, and why. More knowledge on how we as humans operate is also required. Our ways of thinking, rationalizing, contextualizing information, what we consider relevant, etc. Maybe if enough progress is made, the gap between causability and explainanbility, between man and machine, might converge ever so slightly.

Miller, D. D., Et.al.(2018) Here we discuss the applications of artificial intelligence and machine learning in terms of predicting diseases and success rates of medical procedures based on prior information provided. We provide data for the probability model to "learn," based on which it might predict various outcomes of specific problems given as input. For example, we use genetic data of patients to predict or detect cancer, since cancer cells have a distinct genetic impression. But either due to bad reads, human error, or analysis interference, they are not as accurate in predictions. Here, the artificial intelligence model can provide better results using deep learning techniques to better analyze genetic data and hence better predict susceptibility to cancer. Histopathology can be defined as the analysis and study of diseases in the tissues and cells. One can expect high variance in correct predictions even if an expert did it. But the deep learning techniques implemented by the probability model better contextualizes and takes into consideration important subsets of data, therefore having greater success in accurate predictions. Skin cancer, tumor, and other skin conditions can be diagnosed and predicted by such means. Artificial intelligence also helps with better predicting patient survival rates, for patients undergoing various medical procedures or patients diagnosed with deadly diseases. Heart failure and other cardiovascular diseases for example, affect a lot of people each year. When provided with data regarding patients, the machine can identify the patients that have a high likelihood of survival. It can even provide treatment suggestions to small groups of similarly identified patients, in order to improve their chances of survival. All in all, artificial intelligence provides a good approach to analysing vast volumes of multi-dimensional data and predicting outcomes with as much accuracy as possible.

Davenport, T., Et.al.(2019) In the late 80s and the early 90s, rudimentary rule-based systems were implemented in the field of medicine. Here, the systems weren't capable of drawing its own conclusions. It only processed data from that provided, based on a set of rules specified. If the number of rules are large(which, they usually are), it becomes increasingly tedious to account for a rule change, or input data change. Hence, people started implementing more advanced artificial intelligence and machine learning techniques. They also see implementation in the form of robots, to perform basic tasks like picking up tools and delivering them, repositioning and stability during surgery, etc. It is also used in administration. Chatbots have been tried out, to interact with the patient and make them comfortable. Besides this, most hospitals can benefit from having better administration and lower wait times. The lack of patient engagement has been a major problem in the healthcare industry. Regardless of how good the medical professional treating you is, if you do not adhere to following through with the appropriate medical procedures, checkups and administering medication, the likelihood of the outcome becoming skewed is high. Artificial intelligence may prove useful in better engaging with patients, be it with reminders or alerts, to ful-fledged chatbots capable of having a conversation. Aside

from all this, there are some ethical implications to implementing machine learning to such an extent. Most complicated deep learning and artificial intelligence techniques are very complex, and it is almost impossible to figure out the algorithms and reasoning behind a conclusion drawn by the system. The possibility of there being an error will be in the back of any medical professional's mind, who is dependent on artificial intelligence. Mistakes are inevitable and there is no way to account for them. Patients may also prefer the empathy of a human, than a chatbot telling them their diagnosis. All in all further consideration is required when implementing artificial intelligence in a large scale. While the benefits are apparent, so are the drawbacks.

Topol, E. J. (2019) Besides our previous discussion, artificial intelligence also sees application in other, relatively newer aspects to healthcare. Wearables like wristwatches, fitness trackers, etc measure your heart rate, calories burnt, steps walked, body temperature, etc. This helps people to be more self-conscious and self-aware, and ultimately lead healthier lives. There was some skepticism when these were new to the market, as most people were worried about the accuracy of such measurements. In contrast, most smartwatch models implemented strong enough artificial intelligence software to accurately measure their body parameters. Anomalies in heart rate, blood sugar levels, etc can be easily detected by such wearables and treatment can be immediately sought out. Machine vision is another implementation of artificial intelligence gaining traction. Also known as computer vision, it tracks and analyzes input from optical sensors in order to monitor clinics, clinicians, medical procedures, patients in critical condition, etc. It is also used in observation of surgery and other complicated medical procedures, to provide real time images of the patient's area of operation, etc. Besides the main motto of implementing artificial intelligence in healthcare simply being saving more lives, it also aims to do so while maximising efficiency, minimising time consumed and resources expended. Chatbots for the patients, and virtual assistants for lab technicians and clinicians is just the tip of the iceberg. Many small miscellaneous jobs in hospitals can be managed by artificial intelligence. The long term benefit of implementing artificial intelligence is creating a data reserve, which can be accessed any time and constantly referenced, organized and contextualized as more data pours in.

He, J., Et.al.(2019) In an ideal world, implementation of new artificial intelligence and machine learning techniques must be done and updated as soon as they are invented. But, since that is not the case, we must look at the practicalities of it. This leads to the first point, which is the financial issues that come up in technology implementation and updation. Most hospitals simply lack the purchasing power to upgrade themselves to the latest technology, and artificial intelligence is no different. Even if they are able to purchase and install such cutting edge technology, there are implementation complications, malfunctions, faulty machinery, and miscellaneous accidents leading to loss of capital. Which is why, when designing artificial intelligence systems for the field of medicine and healthcare, we must also take into account our target hospitals and clinics, and make it as cost-efficient as possible, in order for it to be widely accessible. Once we have made sure of this, the next problem that arises is the expertise of the work force. As we know, most professionals in the medical field, have studied and devoted their entire lives to their craft. With the average age of a healthcare professional being so high, is it reasonable for us to expect them to be proficient in operating such advanced artificial intelligence machinery? Machinery that, mind you, might change and update every few years, maybe even months. With the advent of newer techniques and implementation of artificial intelligence and machine learning, the need for a tech-savvy artificial-intelligence-literate work force is acutely felt. Maybe once such issues are overcome, the idea of globalised implementation of artificial intelligence in healthcare may not seem that far from reach. Government-aided research as well as government funded artificial intelligence machinery will get us closer to that

reality. We must also make sure the clinicians operating and working with such artificial intelligence machinery are well educated with the working, applications and the capabilities of the system. Although it might be a slow and tedious process, the day where artificial intelligence systems are effectively implemented all over the world is not far away.

Advantages

1. Combining AI with the likes of cloud computing, we can improve healthcare accessibility to the under-developed and developing countries.
2. AI can help predict health and disease risks like susceptibility to cancer and cardiovascular diseases.
3. If implemented in hospital and clinic administration, AI can help save time as well as cost, and improve the overall working of the specific establishment.
4. In complicated and risky medical procedures like surgery, AI operated machinery and tools can perform accurate and precise movements and thus help in increasing the success rates of such procedures.
5. Patients can be assisted by chatbots and clinicians can be assisted by AI assistants and other such interfaces.
6. AI can help understand and draw conclusions from large volumes of multi-dimensional data, which was not conventionally possible.
7. AI helps reduce and eliminate human errors, which could have lead to disastrous events pertaining to patients.
8. The widespread applications of AI in wristwatches, fitness bands, etc has led to the general population being more health-conscious.
9. These fitness bands can accurately measure heart rate, temperature and effectively predict any anomalies.
10. Overall, AI can help globalise the vast local data reserves in each hospital or medical establishment, leading to better knowledge and more successful medical practices.

Conclusion

While it would seem that Artificial Intelligence has a lot of advantages if applied extensively to the healthcare industry and medicine in general, there are a few drawbacks like lack of human interaction, loss of jobs of healthcare workers, machine and algorithmic errors, as well as the tremendous cost of widescale implementation of AI. Unless these issues are addressed in a satisfactory manner, maybe AI in healthcare would do as much harm as it does benefit. Hence, government funding and schemes to support the integration of AI systems in healthcare in a cost-efficient manner, as well as educating medical professionals on the use and potential of such machinery is of great importance. If done right, AI has the capability to completely revolutionize modern medicine, even more than it already has.

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ARTIFICIAL INTELLIGENCE IN HEALTH CARE FOR A BETTER FUTURE

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Introduction

Reddy et.al., (2019)While Artificial Intelligence (AI) is one of the latest fields of engineering, the topic has been comprehensively researched formally since the 1950s. John McCarthy, one of the origin fathers of AI, defined it as 'the science and engineering of making intelligent machines'. Alan Turing acknowledged for a machine to be termed intelligent it will demonstrate behaviour identical from that of a human. With the advances in AI and its ability to emulate features of human intelligence for instance reasoning and decision making, vision and language, knowledge representation, complex task processing and communication, some have recommended that Artificial Intelligence (AI) is getting closer to passing the Turing test and even that Artificial Intelligence (AI) will be the principal provider to the fourth industrial revolution. In the past, there were periods where the potential of Artificial Intelligence (AI) was unable to be realized because of margins in data, computing prowess and funding. However, the present period where there is access to better the computational power and volume of data coupled with increasing financial support presents a more optimistic picture for the application of Artificial Intelligence(AI).

He, J., (2019) Baxter et al. Above and beyond building AI algorithms, 'productizing' them for clinical use in extraordinarily complex. This productization process requires the availability of a massive amount of data, integration into complex existing clinical workflows, and compliance with regular frameworks. AI has issues like Data sharing, Transparency, Patient safety, Financial issue in AI technology execution, Education of the AI- literate workforce, AI policy and the regulatory environment in the United states.

Davenport et al., (2019)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.

AI can be the used in healthcare making it more accurate, by reducing the drawbacks. It will give employment to lots of engineers and also will be time saving in all the works which are done in present time. With the help of AI one can predict the persons who are likely to face health issues. We can get a skeletal picture as the robot actually measures every muscle in your body and instruct the preventative steps that patients has to take in order to avoid future health complications.

Rashmi Mabiyan (2018).Artificial intelligence (AI) and machine learning (ML) are witnessing growing adoption in the Indian healthcare setting. With a surge in non-communicable diseases and the increasing number of aging population in the country, the overall burden of disease management has been increasing year-on-year and to manage that, the government, the healthcare professionals and the healthcare institutions are looking for innovative

ways. Studies have shown that deep learning algorithms have given better insights to clinicians in predicting prognosis and future events in patients. Also, advanced digital technologies like AI and ML can help in prevention as well as early detection of diseases by capturing and analyzing various vitals of patients.

Artificial intelligence makes it possible to access the learning and data from hundreds of thousands of patient cases. We built a partnership where they bring in the technology and we bring in the data, algorithms and the clinical insights into what is impacting and how this can translate into number one risk scoring and then in differential pattern and methodologies.

Literary Survey

Macrae, C., (2019) Artificial intelligence (AI) has a very optimistic potential to improve the safety of health – care, it will make the diagnostic more accurate, it will help in optimizing the plan before the treatment, and it will also help to predict the outcome of the treatment by analyzing the data of all similar cases and comparing it with the maximum number of data to make the result more accurate. Also, intensive efforts are in progress to apply machine learning to an array of clinical tasks, mainly those involving the analysis of medical scans and other images, and health system are enthusiastically seeking to bind the benefit of Artificial intelligence while also start to define principles of appropriate conduct. Many key safety issues are there which should be looked over before starting the design and development of AI systems. Activities like defining requirements and objectives, gathering and cleaning data, training and testing models and producing a used-facing interfaces all implicated difficult decisions, necessary trade-offs and fine grained human judgments the can have a nice implications for safety. A more fundamental challenge to assure the safety of machine learning system is that of opacity- the source of predictions completed by some machine learning systems, predominantly deep neural networks, are successfully an inscrutable 'black box', taking the shape of a distribution of weight more a network rather than a logic that might be explainable by – and to – humans.

Bhattacharya, et.al., (2019) In reference to the healthcare industry, to determine genetic care linked problems, Japan has already been advancing in the field of Artificial intelligence as it as already introduced AI-based robots(programmed personally). These help geriatric person, helping then in their day to day activities, from reminding then to take morning pills to detect the control of sugar level of a person.

It is useful in the diagnosis of Glaucoma also. Glaucoma is an optic nerve disease, is considered as one of the major causes which can lead to blindness. Glaucoma is a global public health problem. Progressive rise in the intraocular pressure which leads to pressure atrophy of atrophy, resulting in a unilateral or a bilateral vision loss. Differentiation in the texture of normal retinal image and glaucoma image is the solution to diagnosis of glaucoma. In this treatment, 'Haralick' features are used to differentiate the image of normal and damaged retina. AI features (image extraction and by the training of back propagation neural network) has been utilize for the diagnosis of glaucoma with 96% accuracy in the result. Another example which is worth mentioning is the UE Lifescience and Niramai, who had adopeted Artificial Intelligence to diagnose breast cancer perfectly. In 2016, Niramai Health Analytics (Bangalore), had develop a non-invasive, affordable solution to screen the early breast cancer based in mapping body heat embedded with artificial intelligence techniques.

Rong, G., et.al. (2020)However, AI doesn't cover the whole process of treatment: empathy, proper communication and the human touch are still evenly essential. It is sure that no application, software or device can reinstate personal connection and trust. The role of human physician is usual, but AI could be a extremely useful cognitive assistant. Artificial Intelligence also means a standard shift in the doctor and patients relationship. As digital health transforms recognized doctor-patient hierarchy into

an comparable level of partnership, what happens with the autonomy that had the essence of care? Who is accountable if an Artificial intelligence assisted medical decision causes harm to a patient? Most doctors make use of online tools to assist with research. Is there really a dissimilarity when it comes in using the AI? Should AI be handled as an another tool, such as a stethoscope or as an person entity? On the patients' side, will they attach to the human touch when there is a shortage simply does not give them a chance to meet up a physician in person for every medical concern? What if Artificial Intelligence algorithms can imitate empathy either through an app or the chatbot? It's not yet known if they will recognize the use of AI in decision-making and learn the use in their care. On the level of all societies, will it help to shift focus from cure to preclusion? Will Artificial Intelligence increase the cost of care? Will doctors and the medical professionals be more proficient, because Artificial Intelligence handles some of time-consuming tasks? Will doctors provide better care in undersized regions with the use of Artificial Intelligence? And generally, how will it (if at all) transform the current structures in the insurance policies?

Yu, K., et.al., (2018)Even if AI has a promising change in the revolution of medical practice, there lies a lot of technical challenges to face. As the AI works in the principle of the availability of large amount of high quality data, it is very important to take care while compiling the data that is representative of the objective patient population. Adequate data curation is necessary for the management of heterogeneous data, several high performing AI generate results that are difficult to interpret by unassisted humans. Even if these models can achieve better than human performance, it isn't straight foreword to express intuitive notions explaining the termination of the models, to identify model weakness, or to extract extra biological insight from these computational 'black boxes'. An illustration, Artificial Intelligence could facilitate ophthalmologists in triaging and interpretation the fundus photographs, enabling them to spend more time in operating room or by discussing treatment procedure with their patients.

Admittedly, Artificial intelligence could be potentially replace some health care employees in carrying the routine tasks, which might in turn restructure the health care employees and alter the present reimbursement framework in healthcare.AI in medical system will inevitably result in legal challenges concerning the negligence in performing the complex resolution support systems. When malpractice there will be cases involving medical AI applications arise, the legal system should have provide clear guidance and the entity which holds the liability.

Hernandez-Boussard, T., et.al., (2020) There is a global consent that Artificial Intelligence(AI) solutions must be not unfair and should be nondiscriminatory and that the Artificial intelligence(AI) solutions in health care must have a positive collision across all sectors of social and economical life. Though, however a lack of incentives, restrictions around all the data shared and data privacy, and getting the stealth of science in industry (e.g., Science that is not backed by peer – reviewed evidence), we have found a health care environment that allows Artificial intelligence solutions to be circulated and deployed at point of care without even understanding that how the model was developed, from what data was the model learned, also the model deemed satisfactory for use.

Transparency is required across the 3 main sections: The population from where the data were obtained; model design and the development, including the training data; and also model evaluation and validation .Requirements of transparency regarding the training data used fir the model progress openly affects the reproducibility, generalization, and also the interpretability of a proposed model. In fact, our recent study show and alarming drawbacks regarding the transparency of AI models developed in research studies. Therefore, we need to have transparency in the coverage of the design, development, evaluation, and validation of Artificial Intelligence (AI) models in health care to

accomplish and keep confidence and trust for all of the stakeholders.

Stanfill, M. H., & Marc, D. T. (2019). By the increase in the adoption of AI enabled applications and more complicated use of Artificial intelligence (AI) applications by health care suppliers at the point of care, holds practical implications for organization the data given. Health Information management professionals have an opportunity to assist in developing, implementing, and managing the policies and measures related to all the governing health care data, and also to support the development, deployment, and also the assessment in AI models to make sure that the technology can be trustful and should also improve the care and support great efficiency.

It is critical track the source of the given data as the accuracy, value, and clinical significance may be tentative. As well, today data practices are entirely tilting towards an episode of care. In AI enabled health care, the fundamental organization plan for health data need to modify from dates of service to the patient. As in the development in AI enable precision medicine, Health Information management professionals will need to develop practices to allow precision. Treating all health care data and information the same will be no longer practical or efficient in an era of big data. The future of AI has promising results with more efficiency in executing the works.

Advantages

1. Artificial Intelligence which are used in machines reduces the manual works and also gives a proper and precise result, it will reduce the errors made by the humans and also the loss of time can be controlled.
2. The positive impact of Artificial Intelligence toward the doctors is that it can aware the doctor of the patient's illness level and also calculate the time and cost of the operation, it can aware the doctor about illness like Heart problem by predicting if the patient will have a heart attack or stroke in coming 10 years resulting it to be a live saving technology.
3. AI based healthcare machines and apps will cut down the time needed in diagnosis and gives an accurate diagnosis of the disease or virus, it is done by the data stored in the apps and machines about various symptoms and medicine side effects. This will increase the life expectancy of the patient and also will be efficient being worthy to be invested.
4. During surgeries a person is always needed to assist the doctors who are operating, this can be assisted by the AI machines who will observe the patient health on regular basis and will be assisting the doctor with the vital information of the patient. The combination of AI and robots will come up with a great help to the medical field in performing complicated surgeries.
5. AI will also be a great help to those with disability and mental health issues as it will help the paralyzed people to live a normal life by its Smart limbs, AI can also assist the disability people in the hospitals to meet the doctors. There are some AI robots that help the mentally disturbed and depressed person to learn personality traits and help the person stay positive.
6. Data analysis and storage is a common problem in healthcare places but AI can be used here to keep the required information and also AI can take data of the patient x-ray report, lab testing reports , blood group etc. so that of the same patient visits there is an adequate amount of data already stored which will help the doctors to analysis the patient more better.
7. AI will result very useful in populated places as there are patients whose health condition gets worst in waiting to meet the doctor so AI can be used to observe the critical patients and also will help the surrounding people by making the checkup recipes more faster compared to the human workers.
8. Antibiotics are useful but some of them have various side effects which is a growing threat to the people with the increasing population, AI can record the Electronic health record date which will

help to identify infection patterns and will show the patients risk before any symptoms are observed.

9. Covid -19 being the threat to the world which spreads with the air and also by inhaling the virus it is dangerous for the humans to be in close contact with the infected patient so here an AI machine can be used to transport or provide the basic need to the patient which will result in decrease infected patients
10. AI devices like smart watch can keep the patient and doctor connected as the patient health being monitored regularly and the data is recorded in the doctor's data sheet which will help the upcoming risks to be controlled in an early stage and saving the patients live, money as well as time.

Conclusion

As mentioned above there is a major role of AI in populated places, India being one of the most populated country in the world if AI was introduced in India patients will not have to wait in the for days in line for their time to come, many patients lose their life waiting for the doctors to check them. AI will help in identifying the critical patients and directing then to meet the doctors as soon as possible, since AI machines can store huge data the blood group of patients will be stored in it and in case of emergency the person can be called for the help resulting in saving someone's life. Every common person has the benefit of using AI machines as it will reduce the time for their work and also will be more effective, devices like smart watches may be used by all the individual monitor their health condition and also learn better way of living in more effective way, AI can also have a good relationship with doctors as well as the common people. AI is the coming future will create a huge difference and will make the thing happen in more precise way, it should be welcomed in the daily life not being fully dependent on AI but gaining the maximum benefit from it.

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USING DRONE TECHNOLOGY FOR SAVING LIVES

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Introduction

Balasingam, M. (2017).A drone is a man made aircraft which flies without a pilot or any passengers. Drones were officially designed solely for the military and for war purposes but now their use has changed and they are now used in photography, for many commercial purposes and for public safety. Drones can be manufactured in different shapes and sizes ,depending on the use . their size can vary from the size of an insect to a giant as well. The larger drones though offer high endurance. Drones can be remotely controlled, they almost require no room to land, they could be dropped using parachutes or could be accessed using control. **Euchi, J. (2020).** Where there are no means of transportation in times of disasters, drones find a way out in delivering aid packages, medicines and test kits in area with contagion. Apart from these aeriel drones, ground drones with artificial intelligence technology are used to aid human activities. They can acquire images of the disaster area, used in maps, in delivering goods (used by google, amazon and hence they rely upon it), used in communication industry. They can help in disaster relief, for capturing data. While it would not be wrong to say that in times of crisis with the covid-19 outbreak, drones have proven to be immensely useful be it delivery of medicines, or to sanitise a personal zone. They can be relied upon, in times when humans are threatened to step out. They allow faster and safer delivery of goods and essentials during the time of need.

Truog, S.; Drone medical delivery has improved especially in sub-Saharan Africa, with ongoing operations in Rwanda, Ghana and Malawi and small international development projects. There is limited published evidence regarding how the public perceives the increasing use of medical delivery drones, although there is some evidence that the public is more supportive when drones are used for public benefit, be it medical delivery or other purposes. This evidence has been compiled mainly by educational institutions and non-governmental organizations, and few drone projects begin with a thorough examination of public opinion or monitoring how ideas change with the progress of the project. As with any new technology, false information and rumors about the use of drones can spread faster than true, and in the case of medical delivery drones, it can block the adoption of life-saving interventions**.**

Literary Survey

Lygouras, E.; Unmanned Aerial Vehicle (UAV),is popularly known as Drone. clearly, a thing we would like is to spot is the technical specifications of the UAVs i.e. its elements, their interactions, their dependableness and operational constraints. To satisfy this will review the technical documents from the makers. to boot, one will interview professional users and UAV pilots. for Social System: usually, UAVs perform their tasks in coordination and collaboration with a team(s) of humans to attain the goals in every SAR mission. Additionally, there square measure humans or a team liable for maintaining and piloting the UAV. Within the context of this analysis there's a necessity to outline the social organization that collaborates with the UAV. There's a necessity to outline the structure of the team the responsibilities of every team member, constraints that ought to be implemented underneath bound conditions. To satisfy this would like one ought to establish contact with the SAR team and

retrieve this data via manuals, official procedures and/or interviews. Not all SAR missions square measure constant. Several things vary between SAR missions, even in missions with constant goal. To boot, once a team executes the tasks within the same space for constant goal, the environmental conditions don't seem to be constant. In short, each mission is deployed during a completely different context. To satisfy this would like one ought to collect information and knowledge on the environmental conditions furthermore as of the piece of ground. He ought to even be alert to necessary data like the position of obstacles and of alternative components of the surroundings, that might act with the UAV and with the SAR team. Thus, one ought to collect information like, meteoric information or piece of ground information from maps or GIS applications and to survey the realm of operations before the mission.

Balasingam, M. The first non- military deployments of drones occurred following major disasters, wherever they supported injury assessments within the affected areas. Their easy use and talent to bypass road closures and fly over rugged terrains while not risk to flight crews created them ideal for such deployments. Drones have later been wont to deliver little aid packages to communities full of major disasters, as well as the 2010 earth-quake in Haiti, the 2012 cyclone (Superstorm Sandy) that affected the northeastern u.s., North American nation and also the Caribbean, the 2015 class five cyclone (Pam) that stricken the islands of Republic of Vanuatu, and also the 2015 earthquake (Gorkha) in Nepal. In New Guinea New Guinea, the organisation 'Doctors while not Borders' used drones to move dummy infectious disease (TB) take a look at samples from an overseas village to an oversized coastal town. This application of drones was important as a result of the country features a giant TB burden with associate increasing incidence of multidrug- resistant TB. Similarly, drones are employed in the fight against the human immunological disorder virus (HIV), that has long exhibit a challenge to third- world nations.11 In African country, Africa—a nation with one in every of the highest rates of HIV infections within the world—the United Nations Children's Fund (UNICEF) delivered HIV testing kits mistreatment drones, thereby dramatically reducing the time needed to check infants living in rural areas. If drone use is acknowledged as additional and economical than current delivery ways mistreatment diesel motorbikes, the delivery method for medical testing kits and provides are revolutionised in continent.

In the within the drone delivery within the u.s., the National astronautics and house Administration (NASA) recently tested a medical provide delivery to a little clinic in rural Virginia employing a drone. provides enclosed medications for respiratory illness, high pressure level and polygenic disease. The testing of the practicableness of this state of the art technology for such a purpose was an amazing success, because it evidenced to be safe and dramatically reduced the delivery time. In Rwanda, Africa, drones were wont to transport blood merchandise and medicines to vital access hospitals and remote regions. The drones navigated mistreatment the worldwide Positioning System (GPS) and Rwanda's cellular network. Hospitals ordered blood and medicines via text messages and received the provides at intervals half-hour. the power to move blood is important; one patient with huge injury will simply run through the blood provide in medium sized hospitals, and bigger hospitals will stop on sure blood sorts. Several previous studies have incontestible that drones square measure a secure methodology for transporting blood merchandise, given blood and vaccines mistreatment samples containing microbes.

Konert, A.et.al., (2019)The most important role of drones is the provision of air freight and these days even passengers. They are very supportive of rescue operations. Drones can be used to save drowning people in times like floods. They can analyze the level of damaged one. They can be used to monitor large circles. In the analysis of Red Blood Corpuscles and certain parts of the platelet and plasma that have been frozen 24 hours from the time

of collection, stored in a cool place and treated for 26.5 minutes separately temperatures range from -1 to 18 degrees Celsius. This analysis did not show any changes to the plate let count, hemolysis of red blood cells and blood pH level. From this we can look at the drones it would be a better way for the purpose of travel. First use of Drones inmonitoring of the following effects of the earthquake was carried out in 2010 in Haiti. A hot camera was attached to the drone and I found the man missing in the desert. In 2015drones used by paramedics to bring life jackets to people trapped in Little Androscoggin River. Foreign rescue services such as China and Iraq provide video and audio tools using drones to communicate with people affected by an emergency. Things have been developed by the Polish Air Force to support targeted rescue operations the exact location of the incident, the previous situation before the arrival of the rescue services and the right number of victims affected. The drone contained ECG monitors, glucometers and defibrillators. Past scenarios and advances in technology have made drones is healthy in its use.

Burke, C., Recently, drones have been proposed as a tool to support a number of disaster risk management areas such as ground-based data collection, 3D mapping, situational awareness, asset planning, injury testing, communications transmission sites, and direct SAR deployment. They are also used to support SAR missions through the introduction of live storage devices such as life vests, or to allow for audible communication through speakers when available. While many drone programs have been proposed to directly target SAR by locating people in need of rescue, so far, they have not been used as the best way to locate casualties in an automated or systematic way, or made more widely available for SAR personnel to use. This may be due to the limitations of the drones themselves or the RGB-based acquisition systems on board. Other groups highlight issues such as scope, flight time, risk avoidance (e.g., trees) and data transfer restrictions.

Grindrone**;** Though drones have been very advantageous over the few years, there are several setbacks which also need to be discussed. they fly at low speed making them slower compared to manned aircraft. These devices are remotely controlled and therefore require data connection and base control. Hackers can access the data connection network and access your control system. Once the enemies are able to access the link through their local mobile network, they can affect your local monitoring or track your remote and Drones survey the area with remote control. Larger zoom lenses, picture viewing, and night vision make it easier to take pictures or record activities in the area. When conducting research, people prefer to use drones that can fly to an inaccessible place and watch the movement in the surrounding area. Drones can be used in battlefields to automatically kill people with the click of a button. This can cause post-traumatic stress disorder in people who control drones in remote areas. Living in an office or in a remote area to shoot objects in battlefields can be confusing when you move out into the real world. Although the drones can be used accurately, sometimes the damage that happens is possible. Arrows and explosives fired by military planes resulted in the deaths of people trapped in the area. The widespread use of drones has led to job losses for pilots because drones do not require the pilot to control them. Cold temperatures in the area reduce battery life. Sometimes climate change affects the use of drones. Most drones are designed to operate at a speed of 30mph so you cannot use them in a wind speed of less than 20mph. Flying drones in rain or snow can damage electronic devices and disrupt communication between the drone and the controller. Plus Buying a drone equipped with all the necessary features for your use can be very expensive. Provincial law requires that different utility drones be installed with certain software, hardware, and camera features and this can be costly. Special training is required for those who will use drones that can add to their cost.

Benjamin powers; since we have talked about the advantages, uses, disadvantages ,now some

important pointers about drones shall be discussed. firstly, they are used for rescue on snowy hill tops. They do aid in disaster management and hence serve as ambulances in the area of need. After this they aid in ways after natural disasters whether it is to supply medicines goods or any necessary stuff. Because of their various sizes they can be sent to places where no transportation is available. They are used in fighting cardiac arrest. Drone programs are being developed to quickly bring automatic external defibrillators (AEDs), which can shock the heart back to life. Other than this drones are used to sanitise a large area which is manually very tedious and hard to do. In the event of a car accident, police investigators often use measuring marks, rowing wheels, to record evidence such as slippery marks and understand what happened. Now some channels go to the sky, using a drone to capture aerial imagery just above the accident, which provides a much more detailed measure than humans could have imagined. Then they can rebuild what happened easily. Hence this way they prove to aid humans and are used in life saving activities.

Advantages

1. With an extensive range of low-cost drones available for several purposes, drones help in all spectrums.
2. Drones have a comprehensive range of movement, they can fly lower in all directions, and can navigate effortlessly when contrasted to a crewed aircraft.
3. With relevant permissions and licenses, drone operators can utilize an Unmanned Aircraft System (UAS) to render safety and surveillance to private organizations, potential venues, and other expenses.
4. Drones also gather reliable information from natural catastrophesto support safety and recovery efforts.
5. Drones monitor locations, communicate possible hazards, and notify threatening conditions such as oil and gas refineries, pipelines and flare stacks.
6. Drones facilitate straightforward and secure inspections of towering and complicated constructions like oil and gas refineries, flare stacks, and pipelines.
7. Drones offer medical support including diagnostics, drugs, or even tools, such as portable ultrasound to the military
8. Drones offer remote diagnosis and treatment of patients by means of telecommunication technology.
9. Fast response times and the ability to navigate otherwise impassable terrain makes drones an attractive medical delivery platform.
10. They offer quick transportation and the opportunity to reach places inaccessible for basic means of medical transport (e.g., because of floods and blocked roads)

Conclusion

Drone technology has proven to be useful in a country like India which has high population and requires fast transportation of medicines and treatment to the affected areas. This technology will also be useful for common men and women as well if we develop low cost drones which work as effectively as the high end ones. Since drones can pass through terrains which are otherwise difficult for people to travel, hence they make work easier and prove to be very helpful in saving lives.

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THE ROLE OF ARTIFICIAL INTELLIGENCE AT HEALTHCARE INDUSTRY

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Introduction

Lu, H., et.al. (2018) Artificial Intelligence (AI) is one of the most important technologies which support economic activities and daily life. It has so far contributed hugely to the sustainable economic growth and continues to solve various social problems. AI has managed to attract the attention as the key factor for growth in developed and developing countries in the recent years. Unlike the common portrayal of AI as robots with human-like abilities, AI encompasses anything from e-Commerce prediction algorithms to Watson machines of IBM.

Darrel M. West on What is AI (2018) derived from brooking.edu Artificial Intelligence systems comprise of three qualities: intentionality, intelligence, and adaptability according to John Allen and Darrel M. West. Researchers Shubhendu and Vijay defined Artificial Intelligence as software systems which "make decisions which normally require [a] human level of expertise" and provide support to people to deal with upcoming issues and anticipate problems. Algorithms of Artificial Intelligence use real-time data to make decisions. They use digital data, remote inputs, or sensors, instantly analyse material, combine information from variety of different sources, and act on the derived insights from those data. They are designed with intentionality by humans to reach on conclusions based on instant analysis. Whereas passive machines are only capable up to working on predetermined or mechanical responses.

Blake, L., et.al (2017) Healthcare organizations face various challenges like developing robust data management strategies to safeguard against the loss of consumers' personal, medical, and financial information. Organizations and consumers remain vulnerable in spite of development of frameworks to decrease the risks of breaches. It was concluded that government officials and healthcare organizations should take necessary steps to counter the significant risk to the electronic health information of consumers.

Rita Sharma on Top 10 challenges healthcare companies face today derived from finoit.com One of the major challenges we face today is harnessing advanced health technology. To transform the health systems, clinicians and healthcare leaders need to build closer ties with medical manufacturers and software application development companies. Other challenges include lack of advanced architecture and data management systems. Rising healthcare costs have always been a matter of great concern among the stakeholders at healthcare industry. In addition to that hospitals also suffer from the shortage of staff and medical experts.

Hamet, P., & Tremblay, J. (2017). Artificial Intelligence in medicine comprises of two major branches: virtual and physical. The virtual branch includes informatics approaches from deep learning information management to control of health management systems, active guidance of physicians in treatment related decisions, and including electronic health records. The physical branch consists of robots used to assist attending surgeon or elderly patients. This branch also uses a unique new drug delivery system, the targeted nanorobots.

Literary Survey

Artificial Intelligence at healthcare industry

Fogel, A. L., & Kvedar, J. C. (2018). Artificial Intelligence is broadly defined as imitation of human cognition by a machine. Computer algorithms learn

through data without human direction in machine learning, through which Artificial Intelligence is driven by. This type of Artificial Intelligence is used by some form of prediction generated from large data set involved in sophisticated processes including web-search, speech-to-text language processing, image recognition, and e-commerce product recommendations. It is believed that Artificial Intelligence has the potential for improved disease surveillance, improved diagnosis, early detection, and uncovering novel treatments, and finally to be able to create truly personalised medicine. It has been predicted by the AI researchers and experts that AI-powered technologies may be able to outperform humans at surgery by the year 2053. This paper emphasises on the fact that AI can eliminate the scope of performing repetitive tasks by physicians thus saving time and enabling a room for human-to-human bonding through the application of judgement in healthcare and emotional intelligence and exercising empathy. Since AI-powered machines collect and interpret more data they continue to make their predictions more precise. Therefore, rather than the concept of such technologies taking over it is believed that such systems can take off much of the unpleasant jobs of healthcare. AI also enables one to have a more human and less fragmented experience. So far AI technologies have been incorporated into various medical fields in order to obtain a more accurate, reliable and early diagnosis. Some of the successful cases being skin cancer screening and diabetic retinopathy. In conclusion, display of active interest by healthcare stakeholders such as researchers, physicians, patients, government and industry can ensure greater development of AI powered systems and improved patient experience.

Opportunities for Artificial Intelligence at healthcare industry

Iliashenko, O., ei.al., (2019) This paper lists out various AI-powered technologies present in the market. For example, IBM's Watson which is question answer-based system using evidence-based learning to support professionals in decision making process. AI systems as a business model has become quite popular among start-ups. A British AI company came up with Deep Mind Health crafted exclusively for medical professionals to come up with accurate and faster diagnosis and also detect diseases at an early stage. Ada is a German start up launched to have an interactive interface which collects relevant inputs from users. Recent years have seen a rise in the popularity of telemedicine systems which collect data from wearables such as fitness trackers or inquirers which are used to define and identify symptoms in patients. A British Artificial Intelligence organisation launched this start up project called Benevolent AI. The prime objective of this is to enable convenient, reliable and easier navigation of available biomedical data and further use it to help advance the drug development process.

Future of Medicine with Artificial Intelligence

Mesko, B. (2017). The core essence of medicine has always been collection of as much as possible amounts of data related to the patient's health and trying to make the most appropriate decisions based on the same. In earlier days all of this was dependent on the attending physician's judgemental skills, experience, and knowledge. But as the world is moving towards digital dependence several advanced technologies seem to be helping the entire process get faster and more accurate. Some of the prominent ones are biotechnology, artificial intelligence (AI), genomics, wearable sensors. And some of the prominent directions they are headed to include: making patients the point of care, establishing foundation of precision medicine, and generating huge amounts of data requiring advanced data analytics.

Instead of making treatments available for populations the focus is gradually shifting towards precision, personalisation and prevention. Medical decisions are being made keeping in mind the similar physical characteristics among the patients. Artificial Intelligence is emerging as the vital technology which can bring this opportunity to daily practice.

Drawbacks of Artificial Intelligence

Topol, E., J. (2019). Although AI has tremendous potential in the medical industry it does come with some major drawbacks. The first one being lack of manpower or rather to be more precise lack of professional data analytics. AI generates enormous amounts of valuable medical data in high resolution medical imaging, electronic medical records and genome sequencing etc. The process of treatment and diagnosis could be majorly benefited by studying and effectively analysing the old and new available information. But this fails to take place due to scarcity of resources and manpower.

Now, AI functions by studying and analysing data and builds its algorithm based on this. There are many instances where there may occur medical mistakes and diagnostic errors. Since the thus flawed AI algorithm would function for large population of people there are clear chances of a huge population of patients getting harmed by it. To summarise, the AI algorithm built with insufficient research poses the risk of leading severe harm to people.

Another issue is related to AI and cyber security. With advanced hacking techniques surfacing in the market there exists tremendous scope for the sensitive information of patients to get leaked. Privacy can be damaged if things like biometrics do not get absolutely secured from external parties.

Need for tests of Artificial Intelligence technologies

McCartney, M. (2018) this paper highlights the importance of 'rigorous testing' when it comes to Artificial Intelligence in medicine. However, the fact that Artificial Intelligence has the potential to make medicine less unpleasant to receive and more satisfying to practice and all together make healthcare safer and faster is also kept into consideration. To use AI in diagnostic radiography, huge datasets are collected. Artificial Intelligence holds great potential in the medicine industry. But it could do more harm than good unless sufficient amount of testing is not conducted. Therefore, launching Artificial Intelligence technologies in public may lead to huge damages unless they qualify the pre-requisites and are tried and tested.

Artificial Intelligence and drug development sector

Mak, K. K., (2019). One of the major benefits of Artificial Intelligence in healthcare industry would be their role in drug development sector or pharmaceutical sector as a whole. Many researchers believe that use of Artificial Intelligence powered technologies would lead to greater efficiency with lesser number of errors. However, so far not a single drug has been developed completely using AI but hopefully with current rate of advancements this feat is expected to be achieved within the next 2-3 years. Nonetheless, AI technologies do come up with the solutions at various staged of development. For example, finding potential drug targets, coming up with drug solutions, increasing the R&D workflow to increase efficiency. AI certainly has played and continues to play a significant role in boosting up the efficiency and effectiveness in research, development and production.

Advantages

1. AI powered applications help in early detection of diseases. They play a vital role in forecasting both non-contagious and genetic diseases and enable us to avoid potential health threats. They make it happen by accumulating patient's data at a single place.
2. Artificial intelligence algorithms play a vital role in saving time and cost. The Ai algorithms appear to be more cost efficient than the conventional methods. They shorten the time and efforts needed during diagnosing and examining patients.
3. Artificial Intelligence powered surgical systems enable performing the most accurate movements with the tiniest of details. With this technology complex operations can be conducted with minimal blood loss, pain and lower risks of side effects. The recovery of patients also gets accelerated.
4. It empowers surgeons with real-time information of the patient's current condition.

5. The exoskeleton robots help paralyzed patients to move without the help of caretakers.
6. Smart prosthesis equipped with sensors enable patients to have more reactive limbs than the original ones.
7. With the service robots performing daily tasks, elderly or sick patients feel less lonely. The conversational and companion robots provide patients with assistance in controlling temperature, sugar levels, blood pressure, as well as taking pills. These robots have built-in capability to analyse the personality that helps depressed patients feel more positive.
8. The involvement of AI in diagnosis would help reduce a number of human errors and provide patients with accurate diagnosis at the right time.
9. At present, many hospitals are facing shortage in the medical staff. At such circumstances AI can come to rescue with the wide range of tasks it can perform. From managing administration to assisting patients with treatment (virtual nursing assistance) and helping doctors with diagnosis, AI does it all.
10. The greater involvement of AI in healthcare and hospitals can also help in fraud detection and reduction of medical malpractices. The integration of existing infrastructure along with technology will help in easier administrative workflow.
11. A large number of medical errors shall be avoided with the reduction of dosage errors with the help Artificial Intelligence.

Conclusion

Countries like India have huge population and often face shortages in the medical staff. In such scenarios AI can be of huge help with its diverse robots such as virtual nursing assistant. The AI powered applications can be of great help to the common population in forecasting genetic and non-contagious diseases. Artificial Intelligence provides a road to development in the healthcare industry. It has so far played a commendable role in the functioning of the medical industry helping a large number of medical practitioners and patients. AI empowered equipment and are the future of medicine. The role played by AI in the drug development sector or the pharmaceutical sector as a whole has encouraged professionals to replace the conventional methods by the new technologies. However, the involvement of AI in an important industry such as healthcare involves meticulous testing and needs to be very carefully assessed before using it for patients.

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ARTIFICIAL INTELLIGENCE AT HEALTHCARE INDUSTRY

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Introduction

Over the years, human intelligence has developed multiple folds. Hamet P &Tremblay J. It had been the year 1930s, the humankind had the primary computer working almost the scale of present-day rooms. The 1970s was the time we started using mini-computers within the healthcare sector. From using the computers for hospital billing, financial applications, and physician billing to using the computers for diagnosis and treatment recommendations, nowadays, computers play a significant role in various domains of the healthcare sector. All of this has been possible only due to the development of Artificial Intelligence (the branch of computer science which is used to develop software and machine which are capable of doing task with the same level of human intelligence and sometimes more than too).

Davenport (2019). These days, AI has been a great help in diagnosis, treatment recommendations, patient engagement and administrative activities to the professional healthcare workers. Studies suggests that AI can now perform some task such as diagnosing the disease equal to or better than humans. There are a lot of areas where the traditional medical healthcare systems can't rescue a person from falling in the prey of death. Some of the domains can be protected easily with the help of the Artificial Intelligence.

Rita (2019). Mentioning some of the challenges faced by the sector are:

1. Payment processing and invoicing

Many people don't have a problem in affording their treatment, but do have issues with affording the after-treatment medicine. There are demands for an effective billing processes and procedure models, where quality is determined first and then comes the quantity. This could lead to patient billing at a lower cost. This requires large scale implementation of change in healthcare payment processing models. Now this is where Artificial Intelligence can do the work very efficiently and effectively.

With proper trained data sets from clinical activities, like screening, diagnosis, treatment assignment and other, AI can be deployed in this area for a human like functioning or even a better functioning.

2. Enhanced and efficient outcome prediction and Diagnosis prediction:

In the medical world, there are cases, where human intelligence makes errors in finding out the disease and the cause behind it. Taking the example of radiology, AI is not only spotting malignant tumours, but the rate of consistency and precision is also better than the human intelligence. In a way, Machine learning techniques like deep learning, NLPs does have an edge over in diagnosis prediction and outcome prediction.

3. Harnessing Advanced Health Technology

Over the years, there has been a great increase in the number of connected devices in the medical sector and experts believe that there will be a more than 20% increase by 2022.Looking at the benefits of Artificial intelligence and Machine learning in the healthcare sector, more healthcare professionals and leaders should join hands with the software companies to develop new models and scenarios to improve adoption of new technology in the healthcare sector.

4. Information and integrated healthcare services

Artificial Intelligence and IoT connected devices provide a huge amount of data that can be used for training new AI techniques and improve the past ones. This data can be also used by the physicians, healthcare professionals for training purposes and research purposes. However, not only capturing and

monitoring data is not sufficient. Most care providers, lack architecture and data management systems deployed for the data that comes from various sources. The problem that still lies is that the companies uses relational databases that can't hold unstructured data.

To encounter this, healthcare companies can switch to non-relational database and plan models for all type of management layers.

There are numerous reasons where the healthcare sector lacks and face problems which can be resolved with the advanced technologies in AI, ML and deep learning. In present day, AI has definitely assisted many physicians, healthcare professionals and clinicians. Paranjape et.al. (2020) Besides all these studies, there is also a belief that it will take many years for AI to replace humans for broad medical process domains.

Literary Survey

Davenport, K. et.al. (2019). AI described both the potential that Artificial Intelligence is able to bring change and also the barriers that prevent AI from the stepping into the modern healthcare problems. Study also described that the demand of the AI in the healthcare sector will increase exponentially as the complexity and rise of data in healthcare. The major domains where AI will be useful and currently deployed are diagnosis, treatment recommendations, patient engagement and adherence, and administrative activities. There are different types of AI technologies. Some of the current technologies deployed is the use of machine learning in finding out welter a person will acquire a certain disease or no. More complex models of machine learning like deep learning is helping the healthcare sector in recognition of potentially cancerous lesions in radiology images. Deep learning is extensively used in radiology for identification of tumours and other diseases that are beyond human eye's perception. Other technologies as a part of Artificial intelligence like Neural networks are used in understanding, creation and classifications of clinical administration. Physical technologies like surgical robots are on field to assist surgeons. They aim to provide superpower to surgeons, improving their precision and take important decisions carefully. Though there are many reasons so as to incorporate AI into healthcare systems, but still the scientists consider many years for AI to completely replace humans for broad medical domains. Some of the hurdles faced by the AI to take stance in healthcare systems are there are issues raised for accountability, transparency, permission and privacy. Medical staff members couldn't hold accountability for the process done by an AI technology.

Jiang, J. et,al* (2017) AI technologies vastly used in 3 disease areas that are cancer, neurology and cardiology. The major areas where currently AI is used and the areas where in future, AI can be incorporated are detection/ diagnosis, treatment and evaluation. Using algorithms designed by humans, AI can learn from a large volume of data and then process the data accordingly to provide assist to the medical staff. The AI devices are mainly of 2 types: machine learning that helps in analyzing structured data and natural language processing which analysis an execution for unstructured data, which then is converted to structured form for the ML machines to analyze them and provide the results. The three main leading causes of deaths: cancer, neurological and cardiovascular diseases can be prevented by early diagnoses. This is where AI is of great significance. With AI system the procedure on imaging, genetic, EP or EMR can be improved. ML techniques takes in personal traits, medical information as input dataset. These values are then processed into different kinds. Neural Network is the most common technique used to identify and diagnose cancer. A more complex form for neural network can be termed as deep learning which is used in the case where the complexity of data is more and it would need more algorithms to solve. One of the recently developed and certified deep learning-based model Convolution neural network (CNN) has been implemented in the medical sector in order to help and assist in diagnosis of diseases. Since there are many hurdles in full time implementation of AI in healthcare. First and

foremost been the regulations, current ones lack the standards to assess the safety and efficacy of the AI system. The second hurdle comes from data exchange. There are very less chances that once an AI system is laid down, the continuous supply of data remains limited.

Ketan, M. et.al (2020), As long as there are new diseases coming up, the world demands more efficient healthcare system, so as to make the people thrive. There is a need for superior technology which can be used to deliver to the needs to the people. There are tons of new sources for data that gives us enormous dataset and values which can be very useful. There are various types of datasets, some include real life evidence, molecular information, data from wearables devices, mobile apps. The data sets are vast and the human brain can't function. According to the survey hosted by the Health Information Technology for economical and clinical health act (HITECH Act of 2009), a doctor had to spend 29 hours reading in order to stay updated. Artificial intelligence here comes into play by using ML and NLP techniques and ease the human's work. AI has also made some serious advancements in NLP natural language processing Machine learning, and deep learning. Today, AI can help us increasing false positive results in screening for breast cancer, assisting robotic surgery. Though there are challenges also faced by AI in the healthcare sector. Nothing comes easy. Challenges faced by the AI technologies to incorporate in the medical sector are: first and foremost, the black box phenomenon which makes it hard for the professionals because they have to take the last action / decision even AI gives you a record. This also leads to misinterpretation and confusion between patient's understandability and his disease and there occurs privacy also. In order to fully incorporate AI into our medical healthcare systems, the medical staff, professionals, residents and students should be educated and trained vigoursoly in these areas to get the best of the two.

Sandeep, J. et.al (2019). With the growth of the artificial intelligence and all other AI techniques, the healthcare industry has seen some major advancements. Patient administration, clinical decision, patient monitoring, healthcare inventions and medicine developments are some of the major areas where Artificial Intelligence are used in modern healthcare. Also, there are some predictions that in some upcoming years, some of the activities that clinicians and physicians will be performed by the AI substituted technology. Studies that represented and formulated that the efficacy and potential of AI-enabled health applications. Infect, AI-enabled medical devices in the market has been facilitated by the United States Food and Drug Administration. For the healthcare administration, AI and data-mini techniques are the responsible techniques that are responsible for augmenting clinical care and lessening administrative demands. Machine learning can also potentially help personalize treatment decisions for patients. Machine learning techniques results in radiology and pathology have been quite positive and effective for patients. Adoption of electronic devices has helped the medical staff by giving access to digital data for monitoring patients. The AI enabled software and hardware has helped the medical staff by getting a close look at the cardiovascular and respiratory monitoring. Healthcare and Medicine developments has seen a major boost with the incoming AI techniques. With the help of ML and NLP, the world has seen less expensive and speedier diagnostic and treatment services. Future of AI and healthcare system looks very fruitful. Machine learning is used and fast-tracked for drug development. Other techniques are still in development and could be anytime available. Also, there is a great hype that soon AI techniques will replace the human physicians, but the scientists have predicted that this hype seems to be false for another couple of years.

Koichiro, O. et.al. Radiology is one of the medical branches that got the most benefit from the latest developments in the Artificial Intelligence. The development in the Deep Learning with the convolutional neural network has been one of the most popular usage and the most promising too. An image diagnosis is the most important thing in the

branch of radiology. One of the other deep learning techniques is one can assist image processing at linear stages. This means, that one can have a look at the segmentation of organs and tissues. Deep learning modules, also helps clinicians, trainees andpatients to gain competence and confidence in different diagnoses. Secondly, deep learning methods also help in decreasing the workload in radiology. Third, the deep learning modules also helps to alert patients, physicians and radiologists what would require some urgent medication help. Besides, these advantages, there are certain limitations. There are certain calculations, theories and features that needs complex interpretation, which sometimes isn't easy. In addition to this, deep learning doesn't necessarily fit and show consistent performance when the data doesn't match with the data during the training sessions. In summary, the slope for deep learning in the field of radiology is positive. This is because of the high image recognition tasks. AI can be expected to bring a change in the radiology branch and also the healthcare sector.

Rushabh shah & Alina Chircu (2018). The Developments in the Artificial Intelligence and Internet of Things has provided several significant benefits to patients, physicians, payers and drug developers. Internet of things (IoT) is a set of technologies that enable machines to communicate and provide instant data analysis and results. The two IoT and AI together is responsible for the huge development in the healthcare system. IoT has a role in collecting and monitoring data-set which further is forwarded to the AI technologies where the data is analyzed and the required actions are taken. These applications have numerous potential benefits for patients, their caregivers, doctors, and hospitals. However, the doctors and patients both should understand about the consistent regulations for data security, systems efficacy, safety and privacy. The IoT wearables and AI connectivity have together led to the disease detection, treatment, patient care and sensor networks.

Advantages

1. Artificial intelligence in healthcare has an edge over the human clinical practice in terms of early detection and diagnosis. Through various methods of machine learning, NLPs being performed on the EMR, Image, Genetic, and EP data, Artificial intelligence can help medical professionals in terms of achieving early diagnoses. The data fed could also be clinical notes in human language, clinical activities, screening, diagnosis, or treatment references.
2. An AI system deployed in the medical sector can help physicians by assisting them in providing up-to-date medical information from different literary sources. In addition to this, AI can also help reduce diagnostic and therapeutic errors that are inevitable from the human clinic practice.
3. Earlier, finding results and conclusions from unstructured data was a tedious process. But with the assistance of Natural Language Processing, a module of computing can help extract useful information from the unstructured data (physical examination, clinical laboratory reports, operative notes, and discharge summaries) to help medical professionals. NLP can also help in fast and more accurate decision making by alerting treating arrangements, monitoring the conditions of the patients.
4. Another major advantage of Artificial Intelligence can be found in understanding the disease mechanisms in different kinds of people. Artificial intelligence can help design and structure personalized medical plans or therapies.
5. With the help of AI modules, scientists and technicians can create highly effective drugs with clinical outcomes that greatly exceed standard therapies. Biotechnicians have been able to create drugs with the help of AI search modules which has indeed benefitted the human race to survive off from some deadly diseases.
6. Artificial Intelligence has helped mental healthcare professionals in analyzing human behavioral data which is used to identify the risks of mental illnesses. Furthermore, it has helped to identify the

measure of risks of suicide among patients with psychiatric disorders.

7. Wearables based on Artificial Intelligence have been used to record, analyze and monitor a patient's real-time information of vital signs like blood pressure, heart rates, saturation, body temperature, blood glucose, and sleep quality. These wearables have improved healthcare quality and patient satisfaction.
8. In terms of a hospital-external environment, AI has found its way with the development of Assistive robots. These robots are specially designed for elderly and handicapped people. One of them is the Smart walker which detects obstacles on the road and suggests a more convenient and safer path.
9. Not only does AI in healthcare helps save the lives of patients but also medical professionals. A program developed by Stanford University, which takes care of the hand hygiene of doctors and nurses. This system can help medical personnel to be protected from hospital infection as much as possible.
10. Artificial Intelligence is to be considered as unrivaled assistance in surgery. With the AI surgical system, humans can perform movements with great precision and accuracy. These systems can also help patients with reducing pain, blood loss, and reducing the risks of side effects.

Conclusion

By reviewing the past, present, and future usage and application of Artificial Intelligence in the medical sector, Al has attracted substantial attention in medical research, It is still impossible to replace human intelligence with Artificial Intelligence. Studies support the above statement with two main hurdles such as the regulations which lack a standard to assess the safety and efficacy of the AI system and the other hurdle is the data exchange (Once an AI system is deployed with historical data, the continuation of future and updated data becomes an issue). Researches also show that the future of AI in healthcare would be very beneficial in handling diseases, early diagnoses, and prevention.

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ARTIFICIAL INTELLIGENCE AT HEALTH CARE INDUSTRY

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Introduction

Mitchell, R.S.et.al (2013). To understand and to progress in theory of computer modeling in learning processes of great significance to fields which is concerned with understanding intelligence is known as artificial intelligence. The most important and fundamental attributes of intelligent behavior is the ability to learn. These include cognitive science, artificial intelligence, information science, psychology, education.etc,. The introduction to Artificial Intelligence is used to connect the gap between the theory and practice, the principles of these Artificial Intelligence briefly tells about the fundamental Artificial Intelligence idea that underlie applications like robotics machine vision, language processing, automatic programming. The book is organized around general computational concepts which is involving the types of data structures used rather than concentrating on the subject matter of the applications. Distributed Artificial Intelligence is concerned with coordinated intelligent behavior. This Artificial Intelligence is used in many industries.

Cooper, R. W.,et.al (2003). The Professional healthcare providers are held responsible for technology and for financial decisions and also for the moral ramifications of their decisions. The writers report the findings of a survey of health care leaders conducted to determine the key factors that provide help and present challenges as they seek to respond ethically to the dilemmas encountered in the course of their work. Implications for the healthcare industry and the nursing profession are been discussed. There are many challenges faced by healthcare industries. Like some of them are Information and Integrated Health Services, there are also some challenges like lack of advancement opportunities, there will be having work load, the persons in healthcare industry will be facing the problem like receiving poor salary. There will be lack of mentoring, poor personal fit with boss, there will be less or limited access to technology.

Davenport, T.,et.al (2019). The hardness and rise of data in healthcare means that Artificial Intelligence will be increasingly applied within the field. Many types of Artificial Intelligence are already being employed by the owners and providers of health care, and life sciences companies. The main role of applications involves diagnosis and treatment recommendations, patient engagement and adherence, and administrative activities. Even though there are many instances in which Artificial Intelligence can perform healthcare tasks as well as humans, implementation factors will prevent large scale automation of healthcare professional jobs for a considerable period. Ethical issues in the application of Artificial Intelligence to the healthcare are also discussed and solved. Artificial Intelligence is used for many things in healthcare industry, like it is used for clinical trial design, for surgical education, it is also used in drug development. Major disease areas that use Artificial Intelligence tolls include cancer, neurology and cardiology.

Artificial Intelligence has the ability to analyze huge data sets pulling together patient insights and leading to predictive analysis. In obtaining insights of patients helps the healthcare ecosystem. The purpose of artificial intelligence is to make computers more useful in the solving problematic healthcare challenges and by using computers we can interpret data which is obtained by diagnosis of various cronic discases. There are three types of artificial intelligence. 1] Narrow or weak artificial

intelligence. 2] General or strong artificial intelligence. and 3] Artificial super intelligence. The impact of artificial intelligence in healthcare is it can increase productivity and the efficiency of care delivery and it allows health care systems to provide more and better care to more people. Artificial intelligence can help in improving the experience of health care practioners, enabling them to spend more time in direct patient care. Artificial intelligence puts the consumers in control of health and wellbeing, it increases the ability of health care professionals to make better understanding and with that understanding they are able to provide better guidance and support for staying healthy.

Literary Survey

The Practical implementation of artificial intelligence technologies in medicine

He,J,.et.al (2019).The practical implementation of artificial intelligence technologies in medicine. Artificial Intelligence (AI) in medicine this term is used to describe the usage of computers and technologies to simulate intelligence of machine in medical fields. Even though the enhancement of AI in medical field is advancing rapidly, the human world clinical implementation has not yet become so effective compared to AI. AI do the development of computer algorithms to implement tasks typically associated with human intelligence. Hereby we will ensure some of the implementations of AI in existing clinical work flows including data sharing and privacy transparency of algorithm, data standardization. The main theme of this review doesn't even cause any disturbances for patient security. We collect the data of present regulatory environment in united states and highlight the features and compare these results across the regions as Europe and china. Artificial Intelligence and machine learning may well offer great promise. But the special relationship that has surged ahead between Royal Free and Google Deep Mind does not carry a positive message.

Deep Mind and healthcare in an age of algorithms

Powles, J., et.al (2017).Artificial Intelligence (A.I.) is expected to significantly influence the practice of medicine and the delivery of healthcare in the near future. Actually, there are only a handful of practical examples for its medical use with enough evidence, popular around the topic is unintimated. The tools and techniques of the data driving especially machine learning methods that underestimate the AI, offers deal in improving healthcare services and systems. It has potentials in medicine, drug design and healthcare, yet, the proof and evidence are yet to be convincing enough for the general public and the medical community to adopt the technology. The deep mind tech is aspiring to pioneer these advantages. Deep mind announced its first major health project i.e.; collaboration with royal free London NHS Foundation trust. At first, they receive it with very enthusiastically, but later on the collaboration between those have suffered with lack of openings and clarity, they even have got trust issues. Although the algorithm that was developed can help detect acute kidney injuries in their patients, there are many privacy concerns created when data is being traded between companies. Machine learning is a tool that can help physicians in their prognosis of diseases such as acute kidney injury. While the authors focus on the morality of data privatization.

Data Mining Applications in Healthcare

Koh, H. C.et.al (2011). Future Directions: In healthcare centre data mining applications have achieved a huge success and benefits. The success of data mining in health cares provides the availability of clean and pure healthcare data. In this aspect the healthcare Industry trying to improve the better captured and storing the data mining. To ensure the benefits of healthcare data mining applications they are trying to include the standardization of clinical vocabulary and sharing the data across organizations throughout the world. Though the healthcare data has good quantitative data analysis. They think it’s not limited it should be unlimited by doing more experiments such as approaching the physicians by

making notes of clinical records. They are thinking to explore the use of text mining to expand the scope and the nature of the healthcare data mining. Data and text mining also useful to be able to integrate the mining. This data mining is also to integrate the mining. This Data mining is also useful to bring the Digital diagnostic images into healthcare data mining application. This process is also done in these areas. Finally, the datamining and healthcare literature and practice can make a contribution with the help of paper. This what authors tell, hence there is a hope that the paper can support the parties involved in healthcare reap the benefits of healthcare data mining.

Artificial Intelligence in healthcare

Yu, K. H.,et.al (2018).Due to the technology the Artificial intelligence is gradually getting many changes in the medical practice. The Artificial Intelligence has widely expanded in the areas that were previously thought to be done with the province and the ideas of humans' experts, like in the recent progress in digital data acquisition and machine learning and increasing to become beneficiary through the infrastructure. In the review article, we highlight the breaks process in the Artificial intelligence technologies and their applications through the biomedical centers. We need to identify the challenges and achievements for the further progress and steps in medical AI systems. Finally, AI summarizes the economic, legal and social involvement of Artificial Intelligence in healthcare. Digital supervisors who claim to be committed to the public interest must do better than to pursue secretive deals and specious claims in something as important as the health of populations. For public institutions and oversight mechanisms to fail in their wake would be an irrevocable mistake. Health datasets can be utilized in order to detect problems that can be present in potential patients.

Use of Artificial Intelligence in Healthcare and Medicine

Khanna, D. (2018). Artificial Intelligence is an area of computer science that has human cognitive functions. AI has brought a paradigm shift in the medical field, this is because of increase in healthcare data and fast increase of analytical techniques. In the new and recent years Artificial Intelligence super passed the human activities and performance in different and several medical field areas, this is most useful for healthcare. and also because of the analytical techniques, Artificial Intelligence has the capabilities to heal, to find, to analyze or to diagnose and to treat the wide range of diseases. This research paper will discuss the different kinds of Artificial Intelligence techniques and how it is used in healthcare, and also it will provide a future view of Artificial Intelligence in healthcare. Artificial Intelligence in healthcare is very useful for people and patients. It has wide range of advantages. AI is a computer science technology, it provides, many clinical decision-making techniques, it improves clinical workflows. It also finds the patient’s risk in the hospital. Artificial Intelligence also been used to predict ICU transfers.

Artificial Intelligence in healthcare: past, present and future

Jiang, F., et.al (2017). Artificial Intelligence is used in healthcare industries, there is a more advantages in healthcare industry due to the Artificial Intelligence. More number of areas use Artificial Intelligence tools which includes cancer, neurology and cardiology. Artificial Intelligence predict, detects the disease of patients. It also diagnosis the diseases, and it helps in the treatment. There are many challenges faced by healthcare industries. Like some of them are Information and Integrated Health Services, there are also some challenges like lack of advancement opportunities, there will be having work load, the persons in healthcare industry will be facing the problem like receiving poor salary. There will be lack of mentoring, poor personal fit with boss, there will be less or limited access to technology. The main role of applications involves diagnosis and

treatment recommendations, patient engagement and adherence, and administrative activities. Even though there are many instances in which Artificial Intelligence can perform healthcare tasks as well as humans, implementation factors will prevent large scale automation of healthcare. This is how the Artificial Intelligence in healthcare in past, present and future.

Advantages

1. Artificial intelligence in medical fields provide a better data driven decision than the mankind.
2. It also increases the disease diagnosis efficiency 10% greater than the human source treatment time is reduced to half.
3. It also integrate and Secure the information of patients.
4. Reduce unnecessary Hospital visits and normalize the patient details.
5. Create a time saving administrative duties which causes less Charges applied on the hospital bills.
6. Payment frauds services can be reduced Using this artificial intelligence.
7. It also provide prevalence the medical errors which leads to tangible penalties.
8. Technology infrastructure need to address increasingly Complex services.
9. It also helps to protect the health data and privacies of the hospital.

Conclusion

Al is changing healthcare. It changes the role of the doctors; it even changes the role of the patient. There are some challenges that need addressing, but the benefits outweigh them, and Al is here to grow and expand. It will change the medical word - in diagnosis, in treatment, in disease detection, in treatment disciplines and more.

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ARTIFICIAL INTELLIGENCE AT HEALTHCARE INDUSTRY

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Introduction

Reddy, S., et.al., (2019) AI(Artificial Intelligence) is one among the latest fields of engineering and sciences. There has been extensive researches on this topic since the 1950s.One of the founders of modern computers and AI, John McCarthy, defined it as 'the science and engineering of making intelligent machines'. If a machine has to be termed 'intelligent' it should pass Alan Turing test, i.e., the machine should prove to be behavior indistinguishable from human beings.AI is most likely to pass the Turing test with its advancements and its ability to imitate, adapt and perform human intelligence features like reasoning, decision making, knowledge representation, vision and language, complex task processing and summary. It is also inferred that AI will be the principal contributor to the fourth industrial revolution. We were not able to realize the potential of AI in the past due to limitations in data, computing prowess and funding. But in the current era, with enormous computational power, volume of data along with increasing funding it provides more sophisticated way for implementing the applications of AI. The roles of AI in medical research and healthcare is evidently increasing day by day. Also the these researches are funded by governments and tech companies. Efforts are taken to introduce AI-enabled healthcare facility into the market. If implemented, AI can reduce the workloads of clinicians thereby providing direct care for patients. They can retrieve accurate patient information by linking algorithms to electronic health records. But still issues like data and label availability, such problems are yet to be addressed. These issues can be addressed by new algorithmic approaches using transfer learning, contextual analysis, knowledge distillation. We also can use machine learning algorithms to reduce waiting time of patients and more effective use of services. AI techniques help in deciding the approximate length of stay of patients enabling efficient use of hospital resources. However the complete maturity of several applications is yet to be realised apart from any technical limitations of AI when compared with human vision, Language Processing and context-specific reasoning, other distinctive challenges exist in applying our techniques in health care delivery. while some Governments support adoption of AI in Healthcare, others support private developers in the development of AI application governments and founders need to formulate strategies on how I can be applied in health care delivery and also the funding.

Bonde, C. AI artificial intelligence is becoming more sophisticated at performing what humans do, but more efficiently, quickly and also at a lower cost. but AI along with robotics have enormous potential in Healthcare industry. AI and robotics are major part of our Healthcare ecosystem. At present, Technologies are slowly increasing in Healthcare industry and they create a lot of excitement on how they can change the Healthcare industry. AI application will also be saving the time and money of the people. According to study, AI applications could possibly save 150 billion dollar annually for U.S. Healthcare by 2026. AI is also gaining importance in pharmaceutical research and development. According to Venture capital firm Rock Health, Around 121 AI companies together raised 2.7 billion dollars in 206 deals between 2011 and 2017. The AI and robotics will make revolutionary changes which brings ease in life of human civilization.

Desai, P., & Shah, S.(2019). when it comes to healthcare, 500 people lose their lives every day due to errors and manipulation of data. Artificial intelligence in health care is estimating human cognition while analyzing complicated medical data using algorithms and software. In fact, AI is the ability of the algorithms to approximate conclusions without direct human input.

Alloghani, M., et.al., (2019) Even though we talk about implementing AI in Healthcare industry, artificial intelligence is still at its research and development phase and cannot replace doctors anytime soon unless an AI singularity occurs. However AI can play a Revolutionary role in assisting doctors to make clinical decisions and diagnosis of different medical conditions. Provided the importance of AI in Healthcare and the future of medicine, it is important to explore the current status of AI in Healthcare while considering its implementation in the future.

Literary Survey

Heathcare Data

Alloghani, M., et.al., (2019) At present the EHRs are modern versions of patient charts as they are real-time and patient-centered with the motive of making patient information available to authorised users. Despite the debate on privacy and confidentiality of patient data the main motive is that access to EHRs is very secure and with the right privileges, it can be set to preserve confidentiality integrity and availability of the patient data. Proper medical electronic record contains diagnosis results, historical medical information and scans from radiology including medication. Other health data available for use along with AI systems include medical notes, electronic records from medical devices, electro-diagnosis and genetic test results. Most of the AI systems depend on these data types and are used at different situations. Also the electronic medical records(EMRs) sources and sensors have become an essential part of Healthcare data and generally contain physiological sensors, wearable activity sensors, human sensors and contextual sensors. Physiological sensors include pervasive sensors which are embedded in Smartphone such as Iphone and Samsung to monitor heart rate and other signals. wearable activity sensors have also become common and they measure activities related to all aspects of physical exercises.

Use of Artificial intelligence in health care

Manimegalai, J., & Khanna, D., (2018). Artificial intelligence algorithms are usually derived from health activities such as treatment assignment diagnosis, etc. Pursuing from a large dataset will help the algorithm to learn similar groups of objects and the connection between subject features and outcomes of interest. So a medical data set will contain different kinds of information such as medical notes, physical examinations, Images and clinical laboratory recordings from Medical devices and demographics. AI algorithms should analyse a substantial portion of data from Diagnostic imaging and genetic testing. For example, radiologists were advised by researchers Topol and Jha to adopt AI Technologies to analyse Diagnostic images which contain large information data effectively. According to medical dataset, there are two categories of data namely structured data and unstructured data. There are different types of methods and techniques that are used to meet their requirements. Machine learning techniques, neural network systems and model deep learning techniques makes sure that structured data such as genetic and imaging data is thoroughly analysed.. Healthcare application uses machine learning procedures to measure the probability of the disease outcomes therefore the patient outcomes are method by mission learning the commonly used type of machine learning is supervised learning it uses the physical types of patient with the help of Healthcare information to provide a more targeted outcome another type of learning is modern deep learning which takes machine learning as the inputs and then processes it into a computerized neural network that simplifies the outcomes. These modern deep learning techniques are very much useful to clinicians on

narrowing down to one or two outcomes when there are multiple possible diagnosis.

Application of AI in Healthcare sector

Desai, P., & Shah, S.(2019). AI can be applied to both structured and unstructured data with the assistance of techniques like machine learning and natural language processing. This technology is widely used, but it is largely concentrated in fields like cardiology, neurology and oncology. Clinicians have adopted technology to reduce manual work and to provide accurate services to the patients.

Curing health diseases using AI:

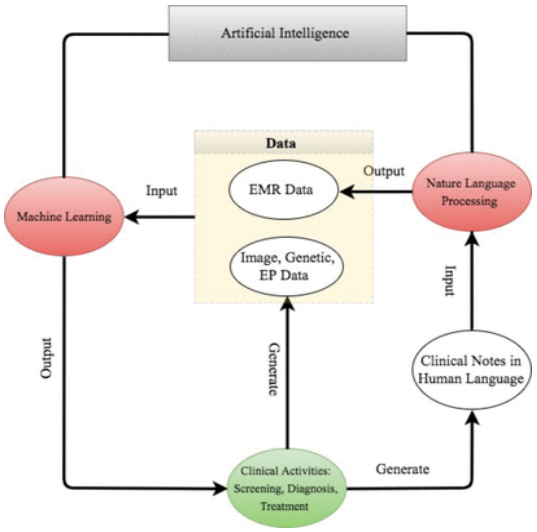
There are lots of inequalities between Urban and Rural Health Services in the developing countries and these issues have become a serious problem of which the lack of healthcare providers in rural areas is the major cause of unavailability and low quality of healthcare in rural areas. So according to some studies application of computer-assisted facilities could improve the health care outcomes in rural areas of developing countries.

Use of virtual health assistance in healthcare systems:

At present, there are lots of health monitors with AI incorporated in them. Some of the examples are, reminding patients to take their medicines on time, remind them when they are about to run out of medicines and order medicines, remind them of appointments, allow virtual interaction with doctors, chat with chatbots which helps in relieving the stress and fears of the patient. Companies such as Microsoft, IBM, Amazon use intelligent conversational systems to respond to text or voice based questions.

AI devices

Jiang, F., et.al., (2017) AI devices consists of two major categories. The first category includes machine learning(ML) techniques that analyses structured data like imaging, genetic and EP data. The ML procedures try to collect patients' information or infer the chances of the disease outcomes. The second category includes Natural Language Processing (NLP)methods that extracts information from unstructured data like clinical notes for medical journals to supplement structured medical data. NLP processes aims at converting text to machine-readable structured data which are then processed by ML techniques. The flowchart presented below clearly describes the process of data generation and the ML and NLP techniques.



Advantages

1. Implementation of AI in healthcare industry fosters healthcare accessibility.
2. AI-driven tools help reveal early disease risks.
3. AI algorithms can save time and costs
4. AI as unique and unrivalled assistance in surgery. AI surgical system allows for performing the tiniest and the most accurate movements.
5. AI helps augment human abilities and support mental health
6. 30% of the healthcare costs are associated with administrative tasks, so integrating AI into healthcare has a multitude of benefits reducing the workload.
7. AI can automate tasks like pre-authorizing insurance, following-up on unpaid bills, and maintaining records.
8. AI has the ability to analyze big data sets, pulling together patient insights leading to predictive analysis.

9. AI helps in reducing unnecessary hospital visits.
10. AI doesn't get tired an wear out easily.
11. AI also helps in fraud detection.
12. Implementation of AI ensures data security.

Conclusion

Artificial intelligence requires a huge amount of Healthcare data in order to train and provide more accurate clinical decision and increased treatment efficiency. There are various ways and techniques that can be used to analyse structured and unstructured data. These techniques help patients as they receive more accurate and efficient diagnosis using which a patient can recover faster than usual. AI is applied in many areas in the medical field including drug creation, treatment design, managing Healthcare records, etc. Rapid growth in AI research and the resources influenced by the government and industry make sure that AI will be used extensively in health care delivery. Also implementing AI in Healthcare sector has huge potential and makes way for cost-saving measures and service quality improvement. Another essential part of artificial intelligence is patient care in which the future holds incredible potential for applying AI to enhance numerous parts of the patient care handle. Also AI can be used in constructive ways to improve our society in a better way. There are high possibilities of AI snatching the job of Healthcare and service provider professionals, but in my personal opinion, AI will ease life of all clinicians nurses, doctors and more importantly patients and help them in making cost cutting decisions and it also saves their time by taking fast and accurate decisions.

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THE ERA OF BUSINESS INTELLIGENCE

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Introduction

Khan, R. A., & Quadri, S. M. K. (2012). The world is experiencing development in all sectors, especially in business. The changes in the business world are so swift that managers of different companies are finding it back-breaking to understand the changing trends of the business environment. Business intelligence has stepped up to resolve this issue. Even though there are several different definitions for BI, simply BI is about delivering relevant and reliable information to the right people at the right time with the goal of achieving better decisions faster. To do this, BI requires methods and programs to collect and structure data. These collected data are converted into information and are presented to improve business decisions. BI takes the vast amount of data generated by different companies and presents it in a meaningful actionable way.

ALISON DOYLE (2020) BI is actually a large and complex field including performance management, analytics, predictive modelling, data and text mining. As BI systems are highly driven by technology, it is significant to note that people who work in this system are highly skilled. Although they require soft skills to communicate and convince non-business professionals on BI, hard skills like programing and knowledge about the database are also essential. BI is all about taking the messy information and turning it into a tidy and accessible resource. So it is evident that the major skill required in this whole system will be analytical skills. One must be highly proficient in analysing the data; as a result, the enterprise can make decisions that are profitable. Besides analytical skills, problem solving skills are also important. The employee or anyone involved in the system must be skilled enough to identify and prioritize the problem. Instead of digging through complex webs of linked spread sheets or analysing the data manually, BI systems have made it easier to access and understand.

MIKE RICHARDSON (2018) Having any time access to organised data can help to discover ineffective business processes and hidden patterns. It also identifies areas of strength and weakness and also assists in discovering new opportunities. This provides us with the ability to understand or even predict an individual customer or segment's needs, preferences and habits. Customers are considered as pillars of any enterprise. So it is necessary to understand or predict the needs of the customer.BI helps in identifying the ideal customer, as a result, we can observe that there will be an increase in the business growth targets. Moreover, the system provides the basis to boost up customer service response. BI anticipates new opportunities to deliver better services or even suggests targeted marketing campaigns as indicated by past observation. In short, we are able to understand the customers very well based on their historical transaction and behaviour.In order to keep the company or organisation competitive, it is high time to keep away from preconceptions and postulates primarily on customer behaviour. In a field like business, it is necessary to make quick and precise decisions rather than making assumptions which are not profitable. So as a whole, business intelligence refers to a group of tools and techniques that collects and organises the data and presents it in a way that is useful.

Literary Survey

(I) Cyber Business Intelligence

CIO buzz news (2016) Business Intelligence might be one of the most known term in the world of business, it is encountered almost everywhere in this field. Throughout the years of its making, it has been known by different monikers. The way that it is approached has been evolving to this day. However,

business intelligence is an umbrella term for data which is collected, stored, analysed and used to make business decisions. IT plays a very vital role with regard to business intelligence. The IT department is initially tasked with collecting data and analysing it. Moving forward, the companies create a BI department all of its own. The CIO's is always aware and constantly updated of what is happening on the BI front. After all, it is to them, the cyber security teams and people report to. Cyber security and Business Intelligence go hand in hand with each other.

Cyber Security Intelligence is also given a high priority by taking into consideration, the benefit that it provides to the owners, managers, CIO's and the cyber security professionals. When it comes to the managers and owners, cyber security business intelligence will present the issue of InfoSec in a factual way which will give them a clear picture of what needs to be done to secure the company. For CIOs and cyber security professionals, this would give them much-needed ammo when meeting with the business decisions makers. It is almost inevitable for the managers and owners to ignore the warnings that are presented to them by the CIO's and cyber security professionals.

Contribution from each and every professional in a company is a key for developing a successful business intelligence technology. 'Contribution', that is mentioned here refers to the data that will be used by the decision makers to allocate funds to the cyber security. Further actions would be taken which would ultimately strengthen the company's defences. The data which the cyber security professionals are able to provide is immense. The data which we are talking about has every right to be considered cyber security business intelligence. But this process of organizing data is not a cake walk. A few basic steps are involved in this process. The most basic process is assigning value to various types of data and allocating time and attention to the important data. Another pivotal process would be the proper storing of all this data and confirming that all this data is organized in a manner that makes logical sense. Certain actions would be recommended by the cyber security team after the analysis of the data. The company also has its own source of data. With the various business intelligence tools that are available in today's world, this unmanageable data can be analysed quite successfully. For example, Panorama have also started involving dark data analysis in their BI tools, this data involves records of attempted attacks and various cyber security trends among all the endless data. Therefore, with the undeniable numbers that are presented the decision makers will have no choice but to act.

(II) How Does Cyber Security Support Business Intelligence?

Entrust solutions (2019) Cyber security is very crucial for business intelligence and it is almost inevitable to ignore it. No company in this world has the luxury to operate without a cyber-security team due to the fact that the business community is becoming more depended on the business intelligence systems to remain in the global market place. The 2017 Telstra cyber security report highlighted that their businesses were affected at least once per month due to the security breaches that were suffered by 59% of Asian companies. Telstra's director of security solutions, Neil Campbell, in an article for the Forbes quoted that "cyber security is no longer just a technology issue; it is a business one too". It is very evident from certain cases such as the 'Wanna Cry Ransomware Attack' that businesses can no longer risk to side-line the cyber security team because sensitive data and valuable business insights from analysed data would be stolen during an attack if innovative cyber business intelligence methodologies are not developed.

Cyber security is integral to business intelligence due to variety of reasons. The major one being the loss of money, insecure business intelligence has cost some serious money to many companies. The 2018 Cyber Claims study by Net Diligence, shed light on the fact that the average total cost of a security breach was $603,900. But for larger companies, it climbed up to an unprecedented

$8.8 million. Another security breach at Marriott in the year 2018, saw the company loose a gigantic amount of $600 million. This piece of information was issued by the Insurance Journal. Apart from cyber security breaches, cyber security solutions can be employed to keep the quality of data intact. As per IBM's Big Data Hub, U.S. businesses lost approximately $3.1 trillion in 2016 alone due to its data quality issues. The ramifications of poor-quality data and better business decisions can be neutralized by the cyber security solutions that can identify sensitive data and determine its quality. In addition to this, cyber security can support business intelligence by maintaining high quality data, freeing decision makers to execute tactical business strategies. Maintaining public trust is of grave importance for a company's success. Failure to do so would result in public mistrust and ultimately lead to the downfall of a business. Effective cyber security measures along with the BI systems might just do the job by helping client information. Thus avoiding such a potential downfall. Facebook and Hadoop have experienced serious blows when it comes to public trust. This has caused both the companies a huge loss of money.

(III) Key Areas of Business Intelligence in the New Era

Stephine shen (2019) When we consider the origin of the concept of BI there were two eras that popularised this. The first was in 1980's when relational database was invented and that was considered to be the tool for data collection and data storage. The second era was in the 1990's when data ware houses was born. This has improved the accessibility of large amount of information. There is numerous numbers of outcomes available in and around. In order to know which is right, business users approach data analysts. This can consume more time as a result there will be a delay in the expected outcome. An ideal tool for BI is considered to have data from the most granular level to highest aggregated level. The accessibility to data and the responses should be quick. The tool must be proficient enough to analyse the given information without programming. Decision makers should understand the content in a common language or visuals. Therefore it is clear that a single tool cannot handle all these areas simultaneously. Neoteric advancement in cloud platform and machine learning has pushed BI into the next era with even faster and easier approach to information.

There are few areas in BI where keen interest must be given. Knowledge about the customers is one such area. This is considered to be a key factor in the journey of BI. When the term data pipelines are taken into account, different groups of users utilise different BI tools. Hence standardised data pipelines are pivotal to guarantee single source of truth. Regardless of source, any data must be standardised before begin used by BI applications. Data ware houses store structured data and not raw data. Therefore it is important to make sure that data's are arranged as layers for different use cases. This can prevent conflicts between processing and data access. As BI tools consume more data, users will face issues on what they should choose or from where to start. A centralised data management with meta-data management would solve this issue. Additionally it is essential to keep a track on the changes that happen in the field. Continuous monitoring is required for continuous improvement.

(IV) Applying IoT to BI

Peggy Smedley (2018) It is observed that BI or business intelligence is changing, as an outcome of IoT. Data is considered to be the income of today's world of business. The immense amount of data that IoT has made available shows that, it is one of the most important catalysts in business intelligence. IoT solution assists business to turn data into profitable insights. This is applicable to wide range of sectors. This includes healthcare, finance, retail and beyond. But on the flip side of the coin, IoT and the data it collects pose a severe threat to an organization's systemic and informational security. The ill effects of leaving IoT devices unprotected have already been witnessed. The Mirai malware which facilitated and

IoT botnet in the year 2016 is a great example. Similarly, IIoT (Industrial Internet of Things) poses the same threat. IIoT and IoT both benefit business intelligence and pose a threat to organizational security.

(V) Sectors that Benefited Most from Business Intelligence

Louie Andre (2019) The type of tools used in BI system varies for sector to sector. It depends upon the type of service that should be provided. There are plenty of tools for BI in the online market. So it is necessary to research and plan before spending money on BI software. Retail industry, Telecommunication industry, Fashion industry, Human resource industry are some of the industries that benefited most from business intelligence software. Real-time reporting capabilities of the software have helped the managers of all the sectors to take profitable decisions. The software also helps the company in acquiring data from various sources which can be made use of in making new strategies and also to keep a track on customer's behaviour. As BI provides accessible information in the right time, managers of sales department can analyse their position and progress for a particular span of time. BI software has also assisted HR (Human resource) managers in analysing the performance of the employees and also to monitor the staff at remote places. By the year 2030 the market for big data analytics is expected to reach $103 billion, according to techjury. This proves the increasing demand for BI software in the future.

(VI) Leading Trends in Business Intelligence in the Year 2020

Countants (2020)As data is considered to be the base of any BI system it is necessary to have access good quality data. This quality can be analysed using certain parameters like completeness, validity, uniqueness, consistency timelines and accuracy. Data Quality Management or DQM is considered to be a crucial one when compared to other promising trends of BI. This includes Business intelligence for sales and markets, AI and machine learning in BI, self-service BI and so on. Collaborative BI as the name suggests it is collaboration between BI technologies and online collaboration tools like social media and web technologies. Collaborative BI enables faster sharing of BI reports and also improves interaction among business users. Augmented analytics is considered to be the leading trend in business intelligence in the 2020. Additionally augmented analytics is expected to reach a value of $13 billion by the year 2030. It is observed that 70% of BI users are casual users who have limited BI related skills. Rest 30% are power users (25%), that is, they use these information for begin more flexible in using business data, and business analysts (1-5%). Customised solution provide by this system have brought up great changes in all sectors. It is also observed that BI will have great demand for the next decade.

Benefits of BI

1. By Utilizing the customised reports or templates from variety of data resources, employees are now able to produce time effective results. The insights provided are easier to analyse and the reports generated are real time. BI reports are interactive with the intent that users can access information even faster.
2. BI system assists in analysing the employee productivity, revenue and department- specific performance. This system also helps organisations to recognize what is working and what isn't. BI also suggests alternative measures which are accurate to the situation.
3. BI software mange and manipulates large amount of data which is an ability of the software that have gone beyond standard analysis. It is also easier to execute with BI software. The system also tracks the competitor's sales and performance and gains an understanding on how to differentiate service and products.
4. It is rare that organisations are provided with refined data and there are many ways that inaccuracies can show up. Businesses that take

care of all these discrepancies are typically more successful. With BI systems, companies can cluster different data source which in turn would help them in analysing their business.

5. BI is an ideal choice for understanding customer behaviour and pattern. The software provides real time information about customers and these insights can assist businesses to retain customers and reach new ones. Buying pattern can also be analysed, so that companies can deliver better services.
6. BI brings out new opportunities and strategies with supportive data, which directly results in long-term profitability and gives a complete idea on what is happening. By analysing customer data and market conditions, employees can now easily detect new sales trends and business problems.
7. The ability of BI tools to unify multiple data sources have helped managers and employees in tracking down information faster. As a result they can now focus on producing accurate and well-timed reports. In addition, employees are now capable of focusing on their short and long term goals and examine the impact of their decision.
8. In today's competitive world, it is necessary that companies make quick and accurate decisions in order to catch up with their competitors. Companies may lose their customers and revenue if they fail to provide accurate and timely decisions. BI systems have ensured that accurate data is provided in a way that it is easier to analyse and come up with timely decision.
9. Increase in revenue is a primary goal for any business. BI provides data that supports businesses to compare across different dimensions and identify sales weaknesses. When organisations identify their weakness and try to rectify them, revenues are more likely to increase.
10. Another concern for businesses would be profit margins. BI helps in expanding the margins and analysing inefficiencies. The collected sales data supports companies to understand their customers and develop better strategies about where the budget should be spent.

Conclusion

As business intelligence system is expanding rapidly in developed countries, India is still warming up to it. BI is a technology with human touch which involves procedures and processes that can build up our capacity for collecting, sharing and moreover for making informed decisions. Businesses can leverage customer data to increase customer engagement and satisfaction and settle business inadequacies. Slowly but firmly, the hidden potential of BI has been realized by Indian companies. Factors like increasingly discerning consumers, stringent government and industry regulations, have trailed to the adoption of Business Intelligence. This has paved way for drastic improvements in operations and competence. The ability of BI to combine business analytics, data mining, data visualization, data tools and infrastructure have aided organisations to make more data- driven decisions. Companies are provided with clean insights on their existing customer's behaviour as a result they can improve their services if needed. With a better understanding of customer's behaviour, needs and wants, firms are in a better position to serve them.In conclusion, it is very evident that business intelligence is integral in this age of information technology and it is the responsibility of the company to take any necessary steps to avoid any tormenting situation in the future. Therefore BI will be a right choice for any enterprise looking for a better data-driven decision making system.

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USE OF DRONES IN HEALTHCARE AND DISASTER MANAGEMENT

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Introduction

Elizabeth Howell (2018)Drones (also known as 'Unmanned Aerial Vehicle' or UAV) are pilotless aircraft (on earth) or spacecraft (outside earth). They are mostly controlled by a control team on the ground, but there are also autonomous drones that do not require manual control. They can be broadly classified as 'Military drones' and 'Non-military drones'. They were first used by the military to prevent fighter plane pilots from getting injured in warzones. Over the course of time, they have evolved to be useful for many purposes other than the military.

Kugler, L. (2019) Drones have a lot of real world applications. They are used for aerial photography, which according to a lot of drone photographers, saves a lot of money than conventional methods. They are also used for various surveillance and survey purposes. They are used for surveying stocks in warehouses, health of crops in agriculture and for a lot of other scientific purposes such as monitoring relative humidity and moisture in air. Many big companies such as Amazon are already using drones in their warehouses, and are seeking to use drones for delivery.

The other major use of drones is in the healthcare industry. They are used to deliver medicines and AED's to rural and hard to reach areas.

In our day to day life, we face a lot of emergency situations. These include sudden cardiac arrests, injuries due to accidents and a variety of other medical emergencies. They may happen at places where conventional emergency like ambulances have very little to no chance of reaching. Even if they somehow manage to reach, they may not have reached at the right time.

The other kind of emergencies are disasters. From natural disasters such as floods, earthquakes, tsunamis, hurricanes and volcanic eruptions to full blown artificial catastrophes like nuclear fallout or chemical warfare. Either way, the damages are too high. The loss of lives are mostly caused due to limitations of current rescue operations.

Tanzi, T. J., et.al., (2016) There are many potential applications of drone technology during emergencies in the form of disasters. The main application is medicine delivery. During a disaster, the roads become unusable due to which many places become inaccessible using conventional transport. In such scenarios, drones can be used to provide medical relief.

Another aspect of disaster management that currently demands a lot of manpower and time is surveying and data handling. This issue can be taken care of, by making drones autonomous, thereby saving a lot of time and energy. They can also be used for mapping certain areas, and for finding humans stuck in debris, by making use of thermal cameras and LIDAR.

Communication is a major challenge during disasters. In such situations, drones can be used to extend telephone coverages. This is extremely useful in rural areas.

My personal view is that drones have already proved their potential in many areas. They are very versatile due to their unconventional properties. They can be highly modified according to any situation, increasing the overall efficiency. They are faster, cheaper and overall efficient compared to any other conventional technology. If the outdated government restrictions are removed or updated to suit the current

needs, drones can save lot of lives much more efficiently.

Literary Survey

Drones in medicine—the rise of the machines

Balasingam, M. (2017) The major problems faced during implementation of drone usage for life saving activities is the regulatory laws in many countries. The government bodies such as FAA in the United States and the EASA in the European Union regulates the usage of drones. Most of the time, these laws are outdated and impractical. This prevents the life saving technology from reaching its true potential. The current challenges faced by the usage of drones within hospitals are the lack of sophisticated technology to take into account patient psychology. This is an important challenge to resolve, as patients are not habituated to multiple drones being present around them constantly. Drones also have a long way to go, for improving on safety and their reliability. Outside hospitals, drugs and organs also need to be stored at the right temperature and be transported safely, necessitating efficient monitoring and operation. The method that is adopted to overcome the challenges is innovating for the future. This includes diagnostic ultrasound imagery, achieved through telemedicine. This has increased the access of echocardiography and long distance consultancy to rural and hard to reach areas in times of emergency. In short, drones have already proved their potential in delivering blood, organs and medical aids in rural and hard to access areas. However, they must overcome the current rules and regulatory problems, as well as the technological challenges in order to completely transform the medicine industry and increase the survival rate.

A Survey of Drone Use for Socially Relevant Problems: Lessons from Africa

Washington, A. N. (2018)The most unique thing about usage of drones non-commercially, is that even developed nations like the United States and European Union have failed the implementation of drones outside the military. This is due to the strict regulatory norms in these nations. Surprisingly, Africa has already successfully demonstrated the potential applications of the technology. The main challenge faced is that drones require trained operators at the time of emergency. Drone parts are prone to get easily damaged due to weather and a lot of other factors. The range of these type of drones is limited due to their weight and size. Protecting the privacy of the general public and restrictive government regulations are other challenges to overcome. Drones are used to plant trees and to assess their health. They are also used in a variety of purposes like poaching prevention, to detect genocide attacks, to help archaeologists in aerial views, to monitor the population of wildlife and even as an anti-shooter response. But the main revolution happened to the healthcare industry. While most countries are still researching on the potential applications of drone technology, Africa has successfully demonstrated it. To overcome the challenges, the following must be done: firstly, the restrictive regulations must be amended. And second, strong tie ups must be made with drone manufacturing companies. By doing so, Africa can expand the serious impact it already has on the world.

Towards" Drone-borne" disaster management: Future application scenarios

Tanzi, T. J., et.al., (2016)The unique thing about drones is their property of being unmanned. This allows themto reach places conventional transport can’t and gives us a new perspective on disaster management. It provides the rescue team with time, as they are now free from the mammoth task of data gathering. Plus, they assist the rescue operation with their advanced sensing capabilities. Drones face the main challenge being prone to weather. They can easily be damaged by rain or strong winds, due to their construction. This makes them not usable at all times. The second challenge is data security. The data collected by drones are not safe, which at times, can risk the general public. Also, they have to be prepared before they are used, such as waterproofing

before operating in heavy rains. The best way to overcome the challenges is to make the drones autonomous. This gives them the ability to continue the rescue operation even after communication from the base station is disrupted. Also, part of the data must be interpreted by the drone, which can be done by creating new data processing algorithms. Plus, the drones must be used as an extension of mobile services, to make emergency communication To solve most of the problems, drones of the future must be built with unconventional sensors like LIDAR, autonomy and the ability to communicate with other drones. Without incorporating these features, usage of drones in disasters can be more of a burden than anything else. By doing so, drone technology will radically change our perceptions about disaster management

The Use of Drones in Emergency Medicine: Practical and Legal Aspects

Konert, A., et.al., (2019). The unique thing about drones is that they do not fall trap to the challenges that conventional means of transport face, such as the local weather conditions. They also can be equipped with gear that makes them useful for scientific purposes. A good example for one such purpose is 'Thermal Imaging'. Other unique properties of drones include their ability to carry large weights despite their small size. Drones also have safe landing mechanism, in case of any failures. This becomes especially useful when they are used to transport organs and blood. The main challenge faced during the implementation of drones in life saving activities is the outdated laws of various governments, such as restriction to fly near airports or above public. Current standards require the drone to be in line of sight of the operator. Despite the challenges, drones have proven their life saving capabilities in various situations, such as in delivering life jackets to people stuck in flood, in reducing time of transfer of defibrillators to 5 minutes on average from the previously set average of 20 minutes by conventional methods of transport. Also, various methods are being adopted to in order to make drone usage effective. Poland serves as an example to the whole of Europe, as it was the first country to make amendments to its laws regarding drone usage. The conclusion is that even though drones have huge potential in life saving, they can be threatening in the wrong hands, and no amount of regulations can prevent such a situation. Amendments in rules must be made taking this into consideration.

Water related disaster management supported by drone applications

Restas, A. (2018) The most unique thing about water related disasters is that they are on both sides of the spectrum. On one end, we have floods, which are caused by excess of water. On the other, we have droughts, which are caused by acute deficiency of it. The problem is that the only tool we currently have to reduce the impacts of these disasters on us is weather forecast. As effective it may be, it is still not enough to prevent major damage. This creates an immediate demand for alternative tools. This is where drones come in. not only in water based disasters, drones also could play a huge role in fire based disasters such as forest fires. The method adopted in using drones to control forests fires is based on the exponential property of fire. Simply put, the sooner the fire is out, the lesser is the cost and energy spent, as fire spreads exponentially. Drones can monitor forests for small fires, and help the rescue team to locate and put it out sooner than conventional methods. This could save a lot of money spent on fire services. In a similar way, drones can be used for water based disaster relief. This might be done in three stages: before the disaster, during the disaster and after the disaster. Before the disaster, drones can be used to monitor the conditions and help in checking the dams and bridges for cracks. During floods, drones can be used to take high resolution images of the affected areas that might help in rescue operations. After the disaster, drones can be used to analyze and estimate the total loss and damage caused. In short, drones

save time by helping the rescue team to locate, rescue and analyze – all while being the same tool.

Requirements and Limitations of Thermal Drones for Effective Search and Rescue in Marine and Coastal Areas

Burke, C., et.al (2019)., The best use of drones is in SAR (Search And Rescue) operations. However advantageous drone maybe, they have some serious challenges that need to be overcome before they are completely reliable. Firstly, drones have very little battery life, so they can capture only a little amount of useful footage during a single flight. Also, the footage transfer speed and quality depends on a lot of factors like bandwidth, distance etc. current cameras use RGB lighting, which requires a lot of pixels for clarity. The method adopted is using Thermal Infra-Red cameras (TIR). This clearly distinguishes humans (and animals) from other elements. Also, they require less pixels than RGB for clarity, which results in a faster data transfer speed. But even this method has some challenges to overcome. The main issue is that it still needs humans to interpret the data, which can be both inaccurate and time consuming at times. This can be solved by implementing machine learning. But this creates even more challenges. The major challenge is their unreliability. Machine learning requires huge amounts of example data, which unfortunately is unavailable. The accuracy of machine learning drops drastically with decrease in amount of data. The reliability of the collected footage is more when the flight altitude is low. But this makes the area searchable during a single flight too less. Also, during tests, the algorithm produced a lot of false positives and false negatives. Adding to that is the fact that human body temperature varies heavily with factors such as clothing and ambient temperature and even flight altitude. So, there are clearly a lot of challenges that need to be tackled for making the use of drones in SAR operations reliable and efficient.

Advantages

1. Drones can be used to transport blood and organs in cases of emergency, much faster than conventional transport methods
2. Drones can reach hard to reach places with poor roads easily, whereas conventional transportation methods can't even get close some times
3. Drones are much cheaper and efficient than conventional transport methods, meaning a whole swarm of drones can be deployed at reduced costs
4. Drones prevent the risk of disaster management teams getting injured during rescue missions
5. Drones can get very close to disaster victims during search and rescue operations, which conventional transport like helicopters cannot
6. Drones can process and transmit various data like weather, road blockage, radiation etc. midair, thereby saving time and energy
7. Drones replace a lot of manpower, which can be used for some other purposes. This saves time and increased the speed of rescue operations
8. After the disaster, drones can be used to carry out surveys, record videos or images to document the losses during post-disaster operations
9. Drones can be used as signal range extenders in places where telephone towers are damaged due to disaster, and can be easily modified to perform many such post-disaster services
10. Drones are fast and easy to deploy, which saves time and speeds up the delivery/rescue operation

Conclusion

For a country like India, where many villages are still inaccessible via conventional transport methods and has average healthcare facilities, drone technology can prove to be of tremendous help. Emergency blood, organ or defibrillators can be delivered to areas that are are highly populous and have heavy traffic, or to the rural areas with no access. With a high population density, overall disaster management is challenging using only manpower. Drones can be used as assistive hardware that help in mapping regions, or in some cases can be used to even perform main search and rescue operations. Even to

everyday man and woman, drones can be pretty useful. They can be used by farmers to monitor crops remotely, used by construction engineers for inspecting building quality and prevent accidents, carry out weather forecasts, find people lost in forests/hills and the list goes on. Commercially, they can be used to deliver goods fast and efficiently, thereby reducing shipping costs for both customers and sellers. Since the technology is not novel and is currently being used for such life saving activities, implementing them worldwide is less of a challenge. Also, my view is that for greater efficiency and purpose, drone technology must be coupled with artificial intelligence, advanced sensors and monitors and improved range. But even after these measures, the implementation still faces one major obstacle – government policies. These outdated and restrictive policies must be removed or at least be made less restrictive. But once these are implemented, drone technology would significantly be beneficial for some, and even life saving for others.

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BUSINESS INTELLIGENCE – A NEW ERA

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Introduction

Big data analytics is emerging as a big technology, which has become a main market among many industries, organizations, regions and among the people. Business Intelligence, known as BI, is nothing but a framework that helps in transformation of data to information, then to knowledge, and then to wisdom. It has the positive affection potential towards the culture of a company. Dedić, N., & Stanier, C. (2016) It can also be defined as a framework that contains a set of methods, analyses, systems and technologies. Efficiency in decision making high profit and low cost are some of the principle advantages of BI. The benefit of Business Intelligence mainly depends on two factors- large data and its analytics. So a good knowledge of the field of the organization will be more helpful if Business Intelligence is implemented in that organization. In my personal view, Business intelligence is a more crucial thing for a company to succeed in its goals, because Business Intelligence helps the organization or company to analyze the available data, discover all the possible ways of achieving their goal and acts as a guide to achieve their goal in the most efficient and easy means. Also, BI helps you to have a concise information about your organization. Sun, Z., et.al., (2018)Currently, Business Intelligence is based on four technological pillar-like aspects-Cloud data service, Social Network service, Mobile service and E-services which are the highly developed fields, thus shaping the markets for e-business and e-commerce. The basic skills required for Business Intelligence are problem solving, data analysis, specific industry knowledge, communication skills, advanced vision and attention to detail, business acumen etc., in order to improve decision making in business aspects.

Literary Survey

Summary

Watson, H. J., & Wixom, B. H. (2007), Business Intelligence has become a more crucial field nowadays. It has two main aspects; getting data in and out. Getting in data gives a very limited value to the company. But if data is getting out from the organization, then it attracts attention from many other organizations, increasing the chances of achieving the target. Metadata plays a key role in getting data in. Metadata is the data that could describe other data. The process of getting in data is called data warehouse. BI improves data management by eliminating redundant data extraction processes, and it also ensures efficient data transfer, thus saving time for both users and suppliers of data. This gives only a local impact. BI ensures success to the enterprise only if the conditions for establishing it exists in the enterprise. BI usage is mainly driven by seniors of the enterprise. BI usage helps the enterprise in many ways, like introduction of a new product line, entering a new market, changing orientation from customer-centric to product-centric etc.,. BI gives many benefits that are difficult to measure, and as time passes by, it could lead to a global impact.

Negash, S., & Gray, P. (2008) Business intelligence is a systematic combination of operational data and analytical tools that help in presenting complex and competitive information to planners and deciding people. It is a field that is being researched limitedly. BI is a more demanded field, and its demand is growing more steadily. BI

assists in corporate performance management, optimisation of customer relations, business activity observation, support in making decision traditionally etc., However, BI could only be used with semi-structured and structured data. BI uses some of the advanced technologies such as On-Line Analytic Processing, Data Warehousing, Data Mining, Executive Information Systems and Enterprise Requirement Planning etc., BI provides assistance in making decisions strategically and operationally. Analysts have to deal with both semi structured and structured data, making the job complex. But BI systems could give a large unexpected benefit, in the future. But this benefit does not occur frequently. And also, this benefit is serendipituous. One main advantage is that the BI market size can be seen from the forecasts published.

Yeoh, W., & Popovič, A. (2016).Business intelligence technology has received considerable level of attention from industries. Business intelligence system implementation involves many factors like multifaceted technological systems, organisational situations and process issues etc., helping in sharing similar characteristics with other intelligence systems' infrastructural projects. Implementation of Business intelligence systems can be done on any dimension of interest in the organization. In relation to the critical success factors identified in literature, organization's experiences were examined by semi-structured interviews, and the results served as primary evidences. Among all the data collected, this data is the most crucial data as it could give the key points to improve the organization and rectify their defects. After the data collection process is over, a cross case analysis is done to understand the findings better. However, BI systems have some disadvantages. Implementation of BI systems is very costly, and it is a resource intensive job. Also, BI systems use multiple case study process to analyse the data obtained, which is a very complex procedure.

Guster, D. E. N. N. I. S., & Brown, C. G. (2012) Business intelligence has become a widely acccepted means to design and manage the systems effectively, hence providing support to make decisions intelligently. Theoretically, applying BI to a large organization is a relatively straight forward procedure, but variations in expectation, difference in management, and politics may lead to out of the blue upshots. Many companies have opted BI as a solution to the poor organization within a company. BI also acts as a tool that helps in running the business in a smooth and efficacious way. BI is more relatable to a old analogy in IT, which is called as data processing. BI gives efficient structure for the design and implementation of a computer system, but it is dependent on the business logic that underlies in the company. For BI to give success, the organization has to find out what etiquette designates success, and if this is familiar to the organization, then BI can be used to take decisions intelligently, which enhances the success rate. BI could possibly have dramatic effects on the process of making decisions intelligently. However, it does not assure better information always. Also, BI initiatives fail in organization where integration and the processes of the organization are poor.

Ranjan, J. (2009). Business intelligence is defined as the process of taking up a huge quantity of data, analyzing the obtained data, and presenting top-notch reports that condense the essence of that data into the basis of business deeds, helping the management to make mandatory business decisions. BI has various components such as OLAP, Advancd Analytics, Corporate Performance Management, Real time BI, Data warehouse and data marts, Data sources etc., Almost every firm in the globe is interested in investing in BI. To have a successful BI system, the firm must consolidate data from different operational systems enterprises and integrate them as a single data warehouse of the enterprises, and this data warehouse is found to be full-fledged in a very less number of firms. The business firms will have to rely more on BI systems to stay ahead of the trends in the future. Business Intelligence helps organizations to take well acquainted decisions and stands as the source of cut-throat benefits. Business

intelligence enables the firm to use the acquired data to expeditiously and ceaselessly respond to changes.

Azvine, B et.al., (2006, June) As with many common opinions, the term business intelligence is not well-defined. Some consider BI as data reporting and visualisation, while other concepts include performance of business management. Data suppliers emphasize data extraction, transformation and integration. These views make it very clear that BI has many faces. BI is nothing but capturing, accessing, understanding, analysing and turning the most valuable asset of an organization, which is nothing but raw data, into applicative information, hence improving their performance in business. BI has three main categories of technology requirements- data warehouses, analytical tools, and reporting tools. Reporting and visualization, anaylsis of trends, customer response analysis, and provision of model by prediction are some of the general features of BI. Real-Time Business Intelligence can be meant in many ways, so it is tough to give an exact meaning of it. RTBI and BI are same except the fact that RTBI works on data which is extricated from functional data sources with zero latency, and provides ways to promulgate actions back into business tasks in realtime. In particular, RTBI includes real-time data delivery, data modelling, data analysis, and much more features.

Advantages

The advantages of Business Intelligence are as follows:

1. Because of BI, reports, analysis and planning can be done more accurately.
2. Business decisions can be made better.
3. Quality of the data used can be improved
4. Satisfaction of the employees can be enhanced.
5. Operational efficiency can be increased.
6. Customer satisfaction also increases.
7. Gamesmanship increases
8. Reduced costs
9. Increased profit
10. Headcount can be reduced, hence preventing extra loss on salary to workers.

Conclusion

In my view, Business Intelligence will help our country to develop economically, as this will minimize the wastage of money and ensures that every single currency spent gives a profit. This technology will be more helpful for common men and women as people could get what they exactly deserve and desire. This technology may act as a key to development for our country, ie., India. Last but not least, BI is a technology that India deserves the most.

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ARTIFICIAL INTELLIGENCE IN MEDICINE

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Introduction

Artificial Intelligence is one of the most sought-after fields in Science and Technology attracting technical minds from across the globe. The roots of AI can be traced to the end of the second world war beginning with a simple question, "Can Machines Think?" AI is the branch of computer science that deals with the simulation of human-like intelligence in computers. The Encyclopaedia Britannica defines AI as, "The the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings."AI is an interdisciplinary science with multiple approaches, but advancements in machine learning and deep learning are creating a paradigm shift in virtually every sector of the tech industry. Since the definition of AI is to imitate human intelligence and decision-making, therefore, its applicability is universal. During its infancy period AI was limited to software and improvement of computer systems. But the application of Artificial Intelligence has seen a gradual induction in various different fields. AI in medicine is one such example that has a tremendous scope of serving mankind.

The condition of the healthcare industry has been quite evident with its handling of the COVID-19 global pandemic. Thousands of deaths and millions of infections have exposed the fault lines in the medical sector in both developed and underdeveloped nations. The fact that healthcare sector needs a facelift in infrastructure is more relevant than ever. Elsevier Australia, (2018) According to Dr Ujjwal Rao, a senior clinical specialist, 14 adverse events occur for every 100 hospitalizations per year amounting to 43 million avoidable patient injuries worldwide. Erica Y Tong et. al., (2017) In another study conducted by a hospital in Melbourne, 61.5% of the patients had atleast one medication error. Another issue faced by the sector is its inability to handle the medical information explosion. Densen P. (2011) Peter Densen in his paper 'Challenges and Opportunities Facing Medical Education' states that by the year 2020 it is predicted that the information about the human body, health and healthcare is expected to double every 73 days. Medical sector is also known for its slow acceptance of new scientific discoveries. Balas EA (2000) E A Balas states in his paper 'Managing Clinical Knowledge for Health Care Improvement' that only 14% of all the new scientific discoveries make it into daily clinical practice. Protection of digitized data is another concern in the sector. The US Govt in 2015 issued a warning that hackers can instruct infusion pumps to deliver lethal medication doses highlighting the possibility of infiltration of medical devices. It may also lead to theft of important or classified clinical trial data. The healthcare sector is thus faced with many such issues that need to be addressed with proper and lasting solutions. This is where AI may step in to make a difference.

Upon hearing the term "Artificial Intelligence" we imagine an Arnold Schwarzenegger-like humanoid robot doing our jobs, rendering people obsolete. Apart from the stereotypes, AI has much more to offer. AI in Medicine (AIM) may be able to solve almost all the above discussed issues in the times to come. An evolved AI system may be able to conduct detailed diagnosis of a patient with the right input and assist doctors by providing important outcomes, treatment methods, survival rates and speed of care. Machine Learning can help AI

systems to even make predictions based on patterns and trends in existing data. This may reduce misdiagnosis and prevent avoidable medication errors. Deep Learning and Machine Learning, by definition, are based on analysing a huge amount of data so new data is always welcome for an AI system. AI systems may also help in predicting how newer scientific discoveries and techniques may be inducted or introduced in the already existing paradigm.

AI, thus, has much more to offer than to rise in rebellion and takeover the world. It is time to separate fact from fiction. AI is the future and it is here!

Literary Survey

Artificial Intelligence at Healthcare Industry

A. N., Kambhampati, et al., (2004) Artificial Intelligence is defined as the branch of Engineering and Science which deals with computational understanding mimicking human intelligence by analysing huge amounts of data, finding patterns and solving these problems logically. AI finds its roots in the 1950's. Today, AI has a tremendous scope in the field of medicine owing to its potential of analysing data and predicting diagnosis, treatment and outcome in many clinical scenarios. The last two decades have seen a surge in the interest of medicine in AI especially in the fields of Artificial Neural Networks (ANNs), fuzzy expert systems and hybrid intelligent systems.

ANN is a famous analytical tool, which vaguely defined, is a man-made copy of the nervous system consisting of highly interconnected computer processors (neurons) capable of carrying out calculations for data processing. This network of artificial neurons consists of an Input Layer, a hidden layer and an output layer. The neurons are connected by links having numerical weights assigned to them. This network learns through repetition. An example of ANN application is PAPNET, a computerised automated screening system which assists cytologists in cervical screening. Other fields using ANN include cardiology, interpretation of CT and MRI Scans, breast, gastric, thyroid, oral epithelial cells, pleural and peritoneal effusion cytology. ANN finds variety of applications as it can exploit intricate relations between clinical, biological and pathological variables with diagnosis, treatment and outcome prediction.

Fuzzy Expert Systems: Fuzzy logic is the field of reasoning, thinking and inference which uses real world phenomena. Instead of treating everything in binaries, black-white, yes-no or up-down, this system recognizes that real world problems may find solutions in between. Since medicine is also a continuous domain and most medical data is also inherently imprecise, therefore, fuzzy logic systems are suited to medicine. Fuzzy expert systems work on 'if-then' rules of modelling. This system has been used in diagnosing lung cancer, acute leukaemia, breast and pancreatic cancer. It has also been used to predict survival in patients with breast cancer in several cases proving its positive applicability in the field of medicine.

Hybrid Intelligent Systems: It is the system combining the strengths and weaknesses of the above discussed AI techniques. This combination leads to a more coherent setup that makes each technique work in a complimentary manner with each other. This synergy allows the hybrid system to learn common sense, extract knowledge from raw data, use human-like reasoning, deal with uncertainty and adapt to rapid changes.

Artificial Intelligence in Medicine: The Challenges Ahead

Coiera, E. W. (1996) The study of AI in Medicine is over thirty years old. Its basic concern is the development of programs that perform diagnosis and make recommendations. Its definition and applicability have drastically changed over the years. Originating in campuses like MIT, Pittsburgh, Stanford and Rutgers, AIM (AI in Med) has attracted some of the best computer experts leading to exponential achievements in the area. AI is a huge collection of technologies and researchers are working to extend the understanding of ways in

which new and more intelligent systems may be constructed and applied in real world.

Medicine and AI can communicate in multiple ways. First, the coordination may be technological in which Medicine may provide complex real-world problems and data to AI researchers to improve the technology. Second; it may be problem driven. In this relation, AI may compete with existing alternatives to provide solutions to pressing medical problems.

As with any other developing field of science, AIM can also be considered to be in its adolescent stage with many challenges lying ahead. Creation of a database of electronic patient record is one such challenge. In this way, clinical data may be pooled and analysed. However, it requires extraction of meaning from complex medical record. Development of a substantial information infrastructure also needs attention. New and quicker methods need to be found to help practicing clinicians to access this information, use it in their practice and submit their own experiences back to the knowledge database to help improve it.

History of AI in Medicine

Kaul, V., Enslin, S., & Gross, S. A. (2020) With the advent of Deep Learning AI systems can now analyse complex algorithms enabling it to be used for risk assessment models and improvement of diagnostic accuracy and workflow efficiency. Using AI in medicine clinical decision-making can be individualized for each patient.

1950s to 1970s

In its initial years AIM was mainly focussed on the development of machines that could replicate humans. In this regard, the first robotic arm, Unimate, was created in 1961 and it performed automated die-casting following step-by-step commands. A natural language processing machine, Eliza, based on pattern matching and substitution was developed in 1964 to mimic human conversation. In 1966, a humanoid robot, Shakey, was built at Stanford which interpreted instructions and it was an important milestone in robotics and AI. Although this period witnessed slow induction of AI in medicine and healthcare sector but digitization of data during this phase was an important development which laid the roadwork for future growth of AIM. Clinical informatics databases and medical record systems were also developed in this phase.

1970s to 2000s

This period saw two “AI Winters.” These terms signify reduced interest and funding leading to lesser significant advancements. Both these dormant phases were due to the perceived limitations of AI and the excessive cost in developing and maintaining digital information databases. Despite this, collaboration among pioneers continued. In 1973, Stanford created a computer system which enhanced networking capabilities among clinical and biomedical researchers. The first AIM workshop was held at Rutgers University in 1975. CASNET model was developed during this period. It could apply information about a disease to individual patients, assisting physicians in management. MYCIN, a backward chaining AI system, was developed in the early 70s. Based on patient information and a database of 600 rules, it could provide a list of pathogens and then recommend antibiotic treatment adjusted for individual patients. EMYCIN and INTERNIST-1 were later developed on similar rule-based systems. A differential diagnosis generating system called DXplain was developed by the University of Massachusetts in 1986 which took symptoms as input. The end of the millennium saw a renewed interest in AIM setting the stage for its modern era.

2000 to 2020

An open-domain question-answer system, Watson, was created by IBM in 2007 which was later used to identify new RNA-binding proteins that were altered in amyotrophic lateral sclerosis. Another technology called DeepQA was developed which used natural language processing to analyse data over unstructured content to generate probable answers. DeepQA could be used to provide

evidence-based medicine responses and aid in clinical decision-making. Pharma Bot, a chatbot, was developed in 2015 to educate paediatric patients and their parents. Deep learning has played an important role in the advancement and application of AI in medicine. From Turing Test to its current avatar, AIM has come a long way with an even more boundless potential for development. Even at this stage, after the development of so many technologies, AI algorithms and their applications need further study and validation. Additional clinical data is needed to create even more integrated databases. Cost-effective models and products need to be introduced for wide usage. And finally, physicians should consider it a partnership for the improvement of Medicine instead of "Human v/s Machine."

Artificial Intelligence in Medicine: Current Trends and Future Possibilities

Buch, V. H., Ahmed, I., & Maruthappu, M. (2018) The newer technologies trying to enter the medical field must inspire medical staff for a paradigm shift, should integrate with current practices. AI has a scope for the emergence of a number of areas in medical application. Although practice makes a man perfect, but a machine only needs the right input to carry out a specific task and if a smart machine is equipped with the ability to learn through practice and patterns like a human then it can do wonders. Even after so many advantages AI and smart machines are shrouded by mistrust in handling real life situations involving patients. So, AI, as of now, acts as assistant to doctors rather than being the decision maker. AI handles tasks which are limited to its scope while patient management is primarily the responsibility of a human doctor. AI, however, has been improving. E.g. AI has been able to recognize target zones for head and neck radiotherapy more accurately and quickly than humans. AI systems have the ability to support a large population which humans are unable to do at individual levels. This ability has been tested by the diagnosis of TB with 95% sensitivity in remote areas of TB prevalent countries by using the radiographs uploaded by a single central system.

AI can create an electronic footprint of patient data which may save time and improve efficiency and later can directly help in patient management. E.g. while a clinician takes a lot of time deciding the course of treatment for a type 2 diabetes patient, an AI system can make predictions based on the patient's data and track record or by converting recordings into summaries. Due to its large databases AI could also play a major role in preventative medicine. The biggest impediment to the widespread adoption of AI is going to be a general hesitant attitude of the public due to its controversial nature even though it could pave the way for a more personalized and individualised healthcare facility to all instead of the 'one-size-fits-all' algorithm.

Artificial Intelligence-Enabled Healthcare Delivery

Reddy, S., Fox, J., & Purohit, M. P. (2019) Significant investments are being made by governments and technology companies in the application of AI in medicine and healthcare due to its tremendous potential and increasing research in the field. AI is most likely to influence the aspects of administration in healthcare, patient monitoring, clinical decision support and interventions.

Sustaining a proper healthcare infrastructure with the existing resources is becoming a burdening task for many countries. IT and AI are emerging as possible contenders for easing this pressure on **healthcare administration** by augmenting clinical care and reducing demands on clinicians. Since AI learns through repetition and pattern analysis, therefore, it can help in freeing the time of clinicians by undertaking repetitive and routine tasks like patient data entry and imaging results. Retrieval system, search accuracy and retrieval speed can be improved with the integration of machine learning algorithms to electronic patient records. This, however, is facing issues due to data and label availability. Another use of ML in administration is clinic scheduling and patient prioritisation. With the increasing digitization of health records and ever-improving fitness monitoring gadgets, the potential

of AI in **patient monitoring** has also increased. We now have details of sleep patterns, blood pressure, heart rate and much more. **Decision support systems** are programs which use data to support decisions made by healthcare professionals thus increasing consistency and efficiency. AI has been used in this filed since the early 70's. Today Machine Learning is also being incorporated into it which is helping in prediction of septic shock, aid diagnosis and treatment of chronic obstructive pulmonary diseases. Equipped with patient monitoring data, this system can personalize treatment decisions for patients. Studies have shown how certain AI systems have been able to recommend alternate treatment paths. Recent significant developments in robotics and computer vision promise a cost-effective and quick diagnostic and treatment services.

Medical Education Must Move from the Information Age to the Age of Artificial Intelligence

Wartman, S. A., & Combs, C. D. (2018)Medicine is a science of uncertainty and an art of probability. The sector is undergoing a gradual change with emphasis on communication, risk management, teamwork and patient safety. Although this change is important but its pace is insufficient and this sector must move from information age to the age of artificial intelligence. The later half of the 20th century in medicine was based on analysis of data that was accurate, specific and organized for a particular purpose and context. Physicians and clinicians in this period had to find ways to validate and effectively use the available information. With the advent of the 21st century, artificial intelligence, machine learning, deep learning and big data, which once were considered futuristic visions, were being inculcated into the healthcare sector. This technology can be better integrated into the sector if it is introduced at the very grass roots i.e. medical education and med schools. But it faces challenges likes tradition, accreditation concerns, and faculty resistance to change. These challenges will be overcome with the community's recognition that the future of medicine lies with healthcare professionals working side-by-side smart machines. Healthcare equipped with AI has a promising future in having a wider outreach. This will enable the flow of a huge amount of data which in turn will only make it better at predictions. The patient-doctor relationship will be replaced by a more dynamic network formed as a result of this technology. Predictions based on the analysis of huge sets of meta-data will be the new standard of patient care. The new learners must be familiarized with the basics of this technology like big-data in terms of decision making. Emphasis should be laid on the four Vs of big data: Volume (it has increased exponentially), Variety (different sources of varying validity have entered the scene), Velocity (the volume has increased and the information being generated is increasing even faster) and Veracity (assessment of the data quality). The future healthcare professionals won't just be learning how to use scalpels and scissors but to collaborate with complex computer systems. As one observer has rightly said, "Educational standards need to be refreshed, refined and improved as technology changes and the data fog thickens."

Advantages

1. With paper being replaced by digital databases, more and more data will be generated. However, piling up of raw data only serves to overwhelm both clinicians and patients. AI with the help of its smart algorithms can process huge amounts of data and even point out patterns that may go unnoticed by the human eye.
2. Induction of AI in medicine will definitely reduce errors and misdiagnosis by under-resourced and less skilled clinicians. This has a promising application in countries that are low on resources.
3. This technology can also fill the voids created due to shortage of physicians and other skilled staff required. For example, automation of routine tasks like triaging CT scans, administrative reporting, EHR documentation, etc. can allow humans to focus on other important aspects and challenges of patients.
4. Since AI can keep a record of the patient's previous and current health records in a single database, therefore, a physician may access it anytime to obtain patterns and carry out accurate diagnosis.
5. In addition to saving man power, this technology will greatly help in improving the efficiency by producing better and trustworthy outputs in lesser amounts of time.

6. Brain-Computer interfaces can create direct communication between technology and the human brain. This will improve the quality of life for people suffering with ALS, locked-in syndrome, strokes. Etc.
7. Experts predict that AI will replace the need for tissue samples in several cases and enable advanced and next generation tools that are more accurate. This will allow clinicians and physicians to understand the bigger picture of issues like tumour instead of focussing on a small section of the malignancy.
8. Electronic health records can help in mitigating issues like rising antibiotic resistance by "superbugs", "super-viruses" and "super-bacteria" by highlighting patients that are at a high risk of infection before they show symptoms.
9. Personalization of Treatment is a major consequence that works in the favour of AI used in medicine. With AI being used in diagnosis and treatment, each patient will receive treatment that is specific to his/her requirements.
10. AI in medicine does not mean that doctors will have to pack their bags and leave. Its introduction is supposed to revolutionize decision making in clinics by aiding doctors, clinicians, physicians and professionals.

Conclusion

Change is the only constant. We have been witnessing machines and smart technologies revolutionizing the world around us. Our modes of communication have changed from letters to Whatsapp texts. Our modes of transport have transformed from animal driven carts to driverless remote controlled and self-driving cars. Our means of warfare have changed from swords and shields to pilot-less drones with pin point accuracy. It is high time to introduce smart and complex technologies like AI in the field of medicine, a field that's in dire need of a facelift. For countries with a huge population like India AI can be a major game changer due to its potential of catering to the needs and requirements of a large database. The medical sector is understanding the revolutionary role that smart and intelligent machines are going to play in the years to come. I am hopeful that one day I'll hear someone in a clinic call out my name and say, "Mr Adeem, the robot will see you now!"

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BUSINESS INTELLIGENCE - SATISFYING BUSINESS

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Introduction

Call Miner (2019), Business intelligence, or simply BI can be defined as a collection of tools and strategies which study and convert raw data into applicable and rational information for the use in business analysis and decision making. Every business has many systems oriented towards transaction that store the data collected from daily operations into repertories. To remain competitive, businesses must regain and make use of the information they have, and this is the part where business intelligence becomes effective. With business intelligence, we can obtain a clear understanding about the data we have, and provide accurate and applicative information which is helpful for decision making. Business intelligence immensely develops business performance, with a return equal to almost ten times of the invested amount. There is also a fivefold increase in the customer experience analysis and decision making speed for the organizations that use business intelligence. On the contrary, not adopting BI has resulted in the disuse of a large amount of available data.

Mike Yi (2020), The main purpose of business intelligence is to enable a business to make knowledgeable decisions. An organization which has an active BI program will have data which is precise, perfect and well arranged. Business intelligence allows the stakeholders to see the historic patterns, so that they can get an estimation about the condition of their organization, make them aware of the problems and also the areas that could be improved for a better performance and result. Business intelligence helps us to arrange teams, and also keeps them well aware about the Key Performance Indicators or KPI's. The awareness about the KPI's will help the teams to be focused towards their goals. The KPI's are easily accessible and helps to save time and energy which can be used for the improvement of the organization's performance. Business intelligence tools also helps to make reports of the team, which gives the teams a clear idea about the aspects they should work on in order to improve their performance and produce the intended results. All teams in a company, such as sales, marketing, and customer support, can utilize the business intelligence tools. The executives, data engineers and data analysts can also take the advantage of these BI tools for the sake of their own study and research.

Literary Survey

History of Business Intelligence

Keith D. Foote (2017), in the year 1865, Richard Miller Devens first used the term "business intelligence" in a cyclopedia named the 'Cyclopedia of Commercial and Business Anecdotes'. He used the term to explain how a person named Sir Henry Furnese, who was a banker, got profited by gathering the information and used it for his benefit before his competition by acting upon it. In 1958, an IBM computer scientist, Hans Peter Luhn, described the potential of collecting Business intelligence by the means of technology, in an article. Business intelligence, as it is recognized today, uses technology for the collection and study of information, and transforms it into useful data, and acts on it 'before the competition'. Basically, the modern version of BI uses the technology for getting clear and error free information which can be used to make quick and efficient decisions. Until 1968, the data could be converted into useful information by only the individuals having extremely specialized skills. The data gathered at that time was disjointed

and not complete and it was generally stored in silos. Edgar Codd, thought of an idea to solve this problem and in 1970, published in a paper his idea to develop a relational database model, which obtained immense popularity and was adopted worldwide.

Types of Business Intelligence

Anjali UJ, (2018), Based on the system in which the business intelligence is to be applied, the BI has been divided mainly into two major parts: The Strategic Business Intelligence and The Operational Business intelligence.

- **Strategic Business Intelligence:** Strategic Business Intelligence or auto delivered intelligence is related with reporting the data from a data warehouse or an analytical data source. The strategic business intelligence helps us by carefully studying the process and providing us with the historical data associated with the process. It is to be conveyed in an interactive manner, and helps the person to present his findings about the data in different ways. Strategic business intelligence represents the trends, opportunities and problematic areas in a graphical way such as graphs and charts.
- **Operational Business Intelligence:** Operational Business Intelligence or simply Operational Intelligence, on the other hand, is related with the transactional or operational data source. It is used to analyze and evaluate operational processes and data for the making of business strategies and decisions. It provides the managers and professionals the information about the daily work processes. The necessity of charts and graphs is not required as it is mainly task oriented. Methods such as instant message, emails, dashboards, etc., are used by the Operational business intelligence for delivery purpose. Invoices, schedules, shipping documents, receipts, etc., are the types of outputs given by the operational business intelligence.

Business Intelligence Analyst

Mary K. Pratt and Josh Fruhlinger, (2019), Any organization which wants to implement BI into its system requires a business analyst in their staff. They use the BI tools to get the required data needed by the organization to identify the areas which can be improved, save the organization's money and increase the profits for the company. Business intelligence analysts have very important role to play in the company's growth. With the help of data analytics, data visualization and data modelling techniques, they will identify the trends in the business and can tell the other teams in the organization to improvise and modernize their productions as per the emerging trends. They use BI tools to compare the data with their competitors, and inform their company about the areas that they have to improve in order to get better results and beat the competitors. They create visualizations about the trends in the industry and tell their findings to the other members in the organization. The business intelligence analyst monitors over the data that is going in and out of their systems, make sure that it is correct and remove the unwanted data from their systems. The job of a business intelligence analyst requires only a bachelor's degree at the initial level, but it may also require an MBA for the advanced ranks. The average salary of a BI analyst as of October 2019 is $67,500, though, it may vary within the range of $49,000 to $94,000 per annum.

Skills required for Business Intelligence

Sandra Durcevic (2019), there are some specific skills that have to be learned in order to master business intelligence. Firstly, you must be familiar with SQL (structured query language) programming. SQL is a programming language that is used in BI. Every person who uses or wants to use BI must know what it is and how to use it. This is the basic skill required, but there are also other skills that have to be learned for mastering BI. Some of them are:

- **Data analysis:** Business intelligence requires good data analysis skills. You need to analyze the available data carefully and thoroughly and provide precise information about it.
- **Problem solving:** BI is not only about analyzing and providing data, but it also about the ability of the person to use the available information to create profitable business strategies and solve the real world business problems.
- **Specific industry knowledge:** You also need to have the knowledge about the industry's dynamics, especially in the area of your work, the current trends in the industry, etc. This knowledge can be

used to make better decisions for the growth and benefit of the business.

- **Communication skills:** Besides having these skills, you also need to possess good communication skills. Communication skills are required to convey your findings of the data and strategies to be adopted to overcome the challenges to your fellow professionals understandably and without any confusion.
- **Advanced vision and attention to detail:** A career in business intelligence is greatly detail oriented. As a BI analyst or developer, you must be able to convert the smallest detail of information into an applicable insight. You need to have advanced vision and forward thinking and also you need to have great attention and not miss out even a minute detail.
- **Business acumen:** Lastly, you need to have business acumen, which means your ability in understanding the problems faced by your company related to business and providing effective and efficient strategies, decisions and solutions in order to overcome those challenges.

Uses and Advantages

Margaret Rouse (2020), Without Business Intelligence, the data based decisions could not be easily made by the organizations. So, they have to depend on other factors such as their previous experiences, knowledge, intuition, etc. for taking important decisions. Sometimes these decisions may turn out to be good, but there is also a chance to get errors and missteps in those decisions due to the lack of data. An organization can get a lot of benefits from implementing BI in their program. One example is that the C-Suite executives such as the CEO, CFO, COO, CIO, etc., and also the managers of the organization can monitor their business performance continuously with the help of BI and can quickly grab or solve their opportunities and problems respectively. With BI dashboards, the organizations can easily analyze the customer data, which helps them to make their marketing, sales and customer service better and effective. Other benefits of using BI include quick and improved decision making, increased efficiency and productivity, improved employer satisfaction, fast and precise reports, trusted and governed data, better data quality, increase in the revenue, detection and prevention of bottlenecks, monitoring the workforce data and financial transactions, develop intelligent and solid strategies, identify the emerging trends in the society, solve the problems related to business effectively, gain an upper hand over other companies, etc.

Disadvantages

Caleb Danziger, (2020), Along with advantages, business intelligence technology also has a lot of disadvantages. An organization or a person who wants to use BI, will need to know its disadvantages along with its advantages. Some of the common disadvantages of using BI are:

- **Data breaches:** One of the biggest challenge faced by any data analysis system is the risk of data leaks. An error in using BI for sensitive information may lead to the expose of data, which can harm the business. Around 30% of the businesses using BI reported that security issues were the biggest challenges faced by them while using BI. To avoid this problem, the organizations must take this issue seriously and provide strong safety measures. They must always look at the security options provided by different apps before installing them in their system.
- **High prices:** Another disadvantage is that BI software can be very expensive. This is justified by high return on investment, but small companies may not even afford the initial prices. The hardware is also very costly and the cost for bearing the IT staff to install the BI software effectively can be very high. This problem can be avoided by choosing self-service BI tools. These tools avoid IT support and also reduce the time taken for the BI to be implemented.
- **Difficulty analyzing different data sources:** Using a lot of sources can be advantageous for us, but the systems may have trouble working across a lot to platforms. This problem is being solved as more advance BI systems are being created and they can contain a range of different data groups.
- **Poor data quality:** In the current scenario, we have a lot of data available with us, but this may be considered a problem. The BI software may analyze the information unhelpful to us, thereby slowing the process and giving us poor quality of

data. Data quality management can be implemented in order to avoid this problem.

- **Resistance to adoption:** One of the concerning issues faced by the companies is that the employees do not want to apply BI into their systems. This could be problematic because if the company doesn't apply BI in all areas, then it won't be much effective. This problem can be avoided by implementing use friendly BI software and telling the employees about the benefits of using that software.

Conclusion

India is one of the major developing countries in the world and I think, for a country like India, Business intelligence is very much useful. While many of the developed countries are readily implementing business intelligence, India is still warming up to it. India should start implementing business intelligence to get the maximum profit. In the near future, as the dependency on the data increases largely, the requirement of business intelligence is also going to increase. India can use BI in the sectors of e-commerce, retail, banking, insurance, etc. It can also be used in the industries like gaming, fashion, public transport, food, and governance. Not only these but all the organizations in India should implement business intelligence in their systems as it improves their business as there will be better decisions made, increased efficiency and productivity, and the quality of products produced by them. This helps in development of our country. The organizations must encourage the people to pursue the course of a business intelligence analyst by hiring the analysts and paying them a good amount of money. The government of India should educate the people and make them to understand about the benefits of including business intelligence in their system. If the system of business intelligence is implemented effectively in every sector, every organization, every industry, then India would see development and progress like never before.

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ARTIFICIAL INTELLIGENCE IN HOSPITALS

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Introduction

Ramesh, A. N. et.al., (2004) Artificial Intelligence (AI) is branch of Computer Science which has the capability of analysing the complex data and provide a meaningful information which can be used in diagnosis and treatment of the patient. Artificial Intelligence is related to the computational understanding which is commonly called as 'Intelligent Behaviour'. It is basically a programme which enables the computer to function like human. Alan Turing (1950) one of the founder of modern Computer and AI defined that intelligent behaviour in computer has the ability to achieve the task in human-level, it later became popular as 'Turing Test'. The major challenges faced by health care industry are lack of advanced opportunities, work overload, poor salary, lack of staffs, lack of mentors, lack of technologies, and lack of proper training etc., . 51% of health workers face the challenge due to the lack of opportunities in their current and previous positions. According to the survey the shortage of health worker is hitting every health care organization in the country. Over 40% of health care workers faces work overload at their concern positions. Many health care employees are taking the additional responsibilities on them due to lack of employees in the industry. Nearly 40% of the health workers faces the issue of poor salary at their industry and they face this problem as their major challenge in life. The major challenge faced in health care industry is lack of technologies or limited access to the technology. 25% of the health care professionals faces the problems due to lack of technology in the health care industry. Another major issue faced in the industry is lack of proper training to the health care employees, lack of training can leave the employee frustrated and confused in their work areas. This can lead to the improper treatment of patients and it can put one's life in risk. Yung-Fu Chen., et. al., (2018) The main use of AI in medical field is to detect the unstructured data and convert it to the meaningful data. It is also used in clinical situations such as diagnosis, treatment and early prediction of disease. AI can be used in health care industry in some areas such as AI techniques in medicine, Data Mining and Knowledge Discovery in medicine, Medical Expert systems, Machine Learning based medical systems, Medical signal and Image Processing Techniques etc.,

Summary

Machine Learning for Medical Diagnosis

Kononenko, I. (2001).Artificial Intelligence is usually a part of computer science which helps to make computer more intelligent. The basic requirement for intelligent behaviour is learning. According to the research it is said that there is no intelligence without learning. The major branch of Artificial Intelligence is Machine Learning and it is the most rapidly developing sub fields of AI research. Machine Learning algorithm was designed and it is used to analyse the medical data sets. Nowadays machine learning generally provides indispensible tools for intelligent data analysis. When the electronic computers came into use in the fifties and sixties the algorithms were designed and developed to enable modeling and analysing large sets of data. There are some specific requirements for machine learning systems such as good performance, dealing with missing data, dealing with noisy data, transparency of diagnostic knowledge, explanation ability, reduction of the number of test. The machine

learning algorithm must be able to extract the significant information from the data and return the diagnostic report on new cases with accuracy as high as possible which human physicians fails in few cases to provide report with high accuracy. In some cases the description of the patients in the record lack certain data so the algorithm must be designed in order to deal with incomplete data of patients.

Artificial intelligence in drug development

Mak, K. K., & Pichika, M. R. (2019) Artificial Intelligence is generally the simulation of human intelligence that is processed by computers. These process includes getting information, developing rules to use the information, drawing conclusion and has the ability of self correction. The development of Artificial intelligence has both advantage and disadvantage. The major drawback is the loss of employment due the technology on the other hand every successful research in Artificial Intelligence has contributed in the development of the society. As Artificial Intelligence is used in various industries and field the idea of adopting the technology in the drug development process has become hype to hope. In drug development the major task for Artificial Intelligence is to find new successful drugs and it is the most difficult part in the drug development areas. Nowadays the technologies has been developed in which AI has versatile tools that can be applied in different stages of drug development such as identification and validation of drug targets, designing of new drugs, drug repurposing, improving the R&D etc. The other application of AI in drug development is to predict the feasible synthetic routes for drug-like molecules, pharmacological properties, protein characteristics, drug combination and drug target association.

Artificial Intelligence in Medicine: The Challenges Ahead

Coiera, E. W. (1996) Nowadays, the importance of diagnosis as a task which require computer support in daily routine clinical situations receives much less emphasis. Artificial Intelligence is now less concerned with the merits of reasoning under uncertainty, decision analysis, symbolic or probabilistic reasoning. The vision in this definition of Artificial Intelligence Medicine was revolutionary. In those days the Artificial Intelligence in medical and health care was United States based researched. The researchers had a vision that the Artificial Intelligence in Medicine will revolutionize medical industry. These work of Artificial Intelligence in Medical industry was originated in a number of campuses mainly including MIT Tufts, Pittsburgh, Stanford and Rutgers. This research field attracted many computer scientist. Their output in the first decade in this field made a remarkable achievement. Artificial Intelligence is a collection of technology and goals it works on both to extend the understanding the ways in which the system can be constructed and apply the knowledge in real world. Medicine is a much older enterprise and much clearer about its goal and AI in medicine is a hybrid field which is formed by the union of the two enterprises and it is also united through Artificial Intelligence in Medicine.

Applying Artificial Intelligence in Healthcare Social Networks

Fiumara, G.,(January,2018) et.al Nowadays, there is a rapid increase in the investment in information and communication technology for health and well being. According to the report made by Grand View Research Inc. by the year 2022 the eHealth market is expected to reach USD 308 billion. The technology used in health care industry is expected to be the vital driver of the market in future. In European countries the key objective is to access the high quality health care in future and it also represent the second largest social expenditure item. Social media has the opportunity for healthcare operators for the improvement of patients' well being. Many Healthcare Social Networking (HSB) platforms has been developed with purpose to enhance patient care and education. Some of the popular HSB platforms include sermo, Doximity, Orthomind, QuantiaMD, WeMedUp, Digital healthcare etc. In these social

networks there are many medical professional act as a moderator. The drawback of social network treatment is it increase the risk for patients due to the distribution of poor quality or wrong information. On the other hand the clinical operators promote the information about the specific disease to the patient.

Medical ethics considerations on artificial intelligence

Keskinbora, K. H. (2019).The raising and growing technology Artificial Intelligence (AI) raised a controversy and ethical complexity because of their intelligence and problem solving skills which even exceed human skills. There are many reasons for ethicists to express their doubt or worry about the future of AI . AI can solve serious problems that can cause catastrophic consequences due to the capability of intelligence and future nanotechnology. The present AI technology with intelligence is equal or superior to human intelligence which is programmed to be confined in a single area such as Deep Blue is an Artificial Intelligence program to play only chess. However human intelligence surpasses Artificial Intelligence i.e human can perform some task that Artificial Intelligence fails to do especially in some cognitive tasks. The challenges will arise for Artificial Intelligence when some cognitive operation of AI is implemented within social realms or in some tasks that usually requires human touch. Advanced cognitive skills can enable Artificial Intelligence to perform better than humans. Some of the application could open opportunities for effective medical care, safer industries and services and it will boost the productivity in a massive scale. AI systems started replacing humans in some sectors. The replacement of human in sectors which are bound to ethics such as physicians, surgeons, judges, nurses, police officers etc., should be avoided. If AI system start realizing their intention it will be difficult to stop and may lead to disastrous consequence.

Artificial intelligence in healthcare: past, present and future

Jiang, Y., (2017) et.al Artificial Intelligence(AI) is used in various fields and industries. AI plays a major role in health care industry. In future AI doctors may replace human physicians, it is practically not possible but they may assist human doctors and can help in decision making in certain areas such as radiology. There are lots of advantages in using AI in medical field as it has the abilities to learn and correct by itself by providing up-to-date information to it. It helps to reduce the diagnostic and therapeutic errors in real time. AI system should be well trained and practiced before deploying it in the medical field. The AI devices mainly falls in two categories i.e Machine learning and natural language processing. Machine learning analyse the structured data whereas natural language processing extract information from unstructured data such as clinical notes. Stroke is a common disease which leads to death. Nowadays AI has been used in research and treatment related to stroke. AI helps in early prediction, treatment and prognosis evaluation. Though the AI is helpful in medical field there are some problems in executing it such as lack of standard on safety and efficacy of AI systems.

Advantages

1. Reduces the errors and increases the precision in treatment of patient.
2. AI has risk taking ability that helps to do the complex work with ease and perfection.
3. AI robots can work 24*7 without any tiredness and with full precision.
4. AI can help in doing repetitive works which humans feel boring to do it.
5. AI robots can also entertain patients when the patients face some mental stress.
6. Fast decisions making helps to treat the patients accurately whereas human make mistakes in fast decision making.
7. Early prediction of disease can be done by AI robots which will help a lot to prevent the diseases.
8. AI can also help in developing the drugs with more precision.

9. In some situation like accident the AI robots can treat the patient in the accident spot and can save the lives.
10. AI systems can monitor the patient's treatment continuously and can react much faster when some treatment is needed.

Conclusion

In India there are many towns and villages which does not have proper medical technologies and well trained doctors. If AI robots are used in India there is a chance to provide the medical facility in local areas and villages. The number of death due to carelessness of doctors is more in India the AI system can reduce the number and can bring a huge change in medical field and majorly contribute to the development of the country. As India is one of the largest producer of vaccines this technology will help to increase the production with high precision. There are very less number of hospitals with advance medical equipment thus the AI robots can flexibly treat patients in some hospitals where the advance medical equipment is not available. The implementation of AI in some rural areas will make a huge revolution in countries' medical field. In some areas the doctors are unable to find the disease and give treatment properly where the AI technology can help to treat the diseases. Apart from India if the Artificial Intelligence Technology is applied in the whole world it will bring a huge development in medical industry.

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TRANSFORMING HEALTHCARE WITH THE HELP OF ARTIFICIAL INTELLIGENCE

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Introduction

As defined by the Oxford Dictionary, Artificial Intelligence is "the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision making, and translation between languages."

Darrell M. West (2018), The term 'artificial intelligence' was first used by John McCarthy to answer the question Alan Turing had raised in the early 1950s: "Can machines think?" Artificial Intelligence is the branch of computer science that aims to replicate or simulate human intelligence in machines. Along with the usual mechanical and predetermined response from machines, Artificial Intelligence algorithms are capable of making ethically correct decisions, with real-time data analysis.

Elsevier Australia (2018), when talking about the challenges faced by the health care industries, the list seems to be quite long. Over the years, the burden of medical errors that could have been avoided and the slow diffusion of medical knowledge has been dominating the area. According to statistical studies, in the context of 43 million avoidable injuries, in terms of quality of life, almost 23 million years of healthy life were lost every year. Being one of the most sensitive industries, the common problems faced by us affect us in almost all possible ways, emotionally, mentally, physically, and financially.

Arvind Kasthuri (2018), Few of the biggest problems faced by the healthcare industries are affordability of the treatment, absence of efficient healthcare staff, and accountability or the lack of it. He also mentions the lack of access and awareness related to issues like these, Keeping the financial problems in mind, there is a huge issue related to payment transparency and patient-friendly billing procedures. Although most of the data in hospitals has been digitalized, there is still no 'single source of data' or an effective analyzing system that is capable of making decisions as well as storing it.

We need to adopt AI techniques that would be beneficial to both individuals and society. The most effective applications of Artificial Intelligence in health care industries can be majorly subdivided into three heads: care, claims, and marketing. By working on algorithms related to the risk of a disease, the mortality rate can be effectively lowered. By using technologies like IoT and AI, physicians have found reliable support to aid their diagnosis and choose the best course for the treatment. The aim to implement AI in healthcare is not just to gain the trust or to benefit the patient but also to take physicians, nurses, and insurance providers into consideration. Although AI is not considered a replacement for trained doctors, it can very well provide additional help in the screening of reports by providing clearer images and coming up with a better analysis. There have been several suggestions to implement sensor networks which would help pharmacy rentals, human resource, material, and expense management. With the help of new technologies, healthcare staff will be able to provide a better process of care. After discharge, this process of digitalized healthcare can be extended through digital homes as well.

Literary Survey

1. Transforming Healthcare through New Era of Artificial Intelligence

Paranjape, K., Schinkel, et.al., (2020) The article begins by stating a piece of very valuable information that it has been estimated that medical knowledge would double itself every 73 days with the help of digitalization. It also mentions how the capacity of a human to grasp new knowledge might be saturated ad the only resort would be to depend on digital technology. It has been predicted that with the help of real-world analysis, molecular information from next-generation sequencing, data collected from different apps, and digital trials, the task of personalized digital diagnosis of a patient will become way more efficient.

Currently, AI is greatly used in the healthcare department to decrease the probability of wrong results in lab tests, reduce medical transcription cost, and improve physician workflow. The adoption of robotic surgeries resulted in a shorter stay at hospitals, minimized loss of blood, and efficient prediction of the mortality rates of patients.

The article further goes into the details of detecting and personalized diagnosis of diseases like lung cancer and sepsis. Talking about the challenges with the adoption of AI in healthcare, it usually lingers around liability and privacy. To overcome these issues, the crowd needs to be educated on the specific technologies and their working, making the diagnosis transparent, reliable, and reproducible.

2. Use of Artificial Intelligence in Medicine and Healthcare Industry

Manimegalai, J., & Khanna, (2019), The adoption of Artificial Intelligence in the healthcare department has been so useful that it has created a subtle tension about it surpassing human ability to treat without any technological aid. By using self-correcting and self-developing algorithms that can hold data for large masses with minimal errors, AI has been proven to be way more efficient than we had expected.

Further, as we read, the article mentions the types of datasets used, namely demographics, clinical laboratory reports, and physical examinations. It talks about the different methods of Machine Learning, Neural Network Systems, and Deep Learning techniques that would ensure nearly error-free analysis.

When it comes to drug creation, by using Machine Learning algorithms, it is expected to take a shorter period for the discovery of a particular drug. It would also be cheaper and safer. AI has also helped in upgrading the treatment methods. With the capability of analyzing and accurately recognizing symptoms of medical images such as X-rays, CT scans, MRI, and ultrasounds, AI has been way more efficient compared to human analysis. One major issue with AI is regarding data management. Several computing tools and cloud computing is used to resolve this issue by making the data transparent. As mentioned in the article, the medical expenses would considerably fall in the future years due to efficient diagnosis.

3. Artificial Intelligence at Health Care Industry

Jiang, F., Jiang, Y., et. al., (2017), The article tells us about how even if the human physicians aren't completely replaced by machines in the future, it is quite probable the doctors will be assisted by Artificial Intelligent Systems to make better clinical decisions or analysis.

From the aspect of a medical representative, the article talks about the motivation, data types, mechanisms, and the diseases the current AI Systems are tackling. AI Systems are work on population-based analysis conducted to assist real-time clinical solutions. The clinical data usually exists in the form of demographics, medical notes, electronic recordings from medical devices, physical examination of the patient, and laboratory images.

AI devices are major of two types, namely Machine Learning Techniques and Natural Language Processing Methods. Even though they're a ton of diseases that can be treated with the assistance of AI systems, there is an unusual concentration around cancer, neurology, and cardiology. There is also a brief detail about the workings of the vital AI components, support vector machine, and neural networks.

With early detection and diagnosis supported by AI, the treatment is found to be way more efficient.

The article involves a comprehensive discussion revolving around the adaptations of AI Systems in the healthcare industry in various countries.

4. Use of Artificial Intelligence in Healthcare and Medicine

Khanna, D. (2018), Artificial Intelligence has been playing a vital role in our daily life for decades now. We use AI algorithms almost in every step of our life to improve the efficiency of the work. There have been several articles and research papers proving how Artificial Intelligence has aided in human judgment when it comes to clinical decisions and increased treatment efficiency. Artificial Intelligence has not only simplified the medical procedure by performing complicated tasks in lesser time but also within a fraction of the cost.

AI algorithms are abled with self-correcting facilities and improved learning techniques to increase the efficiency of the work procedure. There are also provisions to store the information for future reference. By predicting the health risk alerts, AI algorithms help reduce the common errors encountered by human judgments during treatments. Machine Learning techniques, Neural Network systems, and Modern Deep Learning techniques assist doctors in understanding the probability of the disease outcome better. With the help of cloud computing, the historical databases can be stored which are later used for better analysis.

Artificial Intelligence has not only aided in the procedure of the treatment but also in discovering and developing drugs. By modifying the whole design of treatment, Artificial Intelligence has not only helped the patients with a better health care service but also helped the doctors learn new methods and efficient procedures.

5. Artificial Intelligence in Healthcare – A Review

Murali N., & Sivakumaran, N. (2018), Artificial Intelligence refers to the intelligence adapted by machines which when applied in healthcare procedures, helps doctors find efficient modes of treatment. With the help of AI algorithms, doctors would not be needing to learn everything by heart. Digital technology takes care of storing all the information while the doctors and nurses can focus on better patient care. Doctors and medical professionals have also been utilizing AI to develop drugs for diseases that would have otherwise been fatal. With medical survey reports of masses, such tasks have proven to be successful as well.

The huge data analytical tools have helped medical professionals deal with patients efficiently by taking the best possible decision, by saving time and also at a considerably low cost. With the help of robots, analyzing tasks such as X-ray scans, CT scans, MRI scans can be performed with half the time consumed by humans at greater efficiency. It usually takes a decade to discover a drug by performing clinical tests. With the help of AI, drugs can now be discovered in days that are way safer and cheaper than the ones discovered manually. Healthcare management gadgets are currently in trend. They help monitor the common parameters of health such as diabetes, blood pressure, and level of oxygen saturation in the blood. For minimal health assistance, healthcare bots are also available through apps.

AI is not only implemented in treating the usual diseases, but also for detecting various mental problems, for increasing the efficiency of chemotherapy for cancer patients, management of diabetes, performing complex surgeries assisted by robots, and many more.

6. Future of Artificial Intelligence in the Healthcare Industry

Desai, P., & Shah, S. (2019), Artificial Intelligence deals with the area where tasks performed by humans are replaced by machines to achieve greater efficiency. The paper talks about the various roles of artificial intelligence in healthcare such as the detection of DNA mutation in tumors. By using algorithms that analyze past reports and predict future outcomes, medical professionals have been able to provide a better form of treatment to cancer patients.

One of the most efficient usages of AI has been its installation in the ICU department of the hospitals. With the help of multiple sensors, even the

basic movement by a patient can be detected and analyzed. In critical situations where human judgment might go wrong, AI-based algorithms have proven to provide medical professionals with the best decisions. Currently, AI healthcare is focusing majorly on two things: better patient outcomes and to reduce the cost of medicine.

With the help of techniques such as machine learning and natural language processing, AI is equipped to process both structured and unstructured data. With the help of electronic health records, computer-assisted diagnosis, and robot-assisted surgeries, medical treatments have reached a new level of excellence. Even though virtual health assistance can never replace the typical doctor assistance but chatbots have helped patients with the aftercare such as managing doctor appointments, medicine reminders, detection of the possible ailments with symptoms, and many more.

Although there are numerous challenges faced when it comes to ethical decision making by AI algorithms, the benefits of adopting AI into the system outweighs them. Professionals believe that in the future, there will be tasks that will be carried out by machines with zero human assistance. The process of adapting technology into healthcare is still evolving and holds great potential.

Advantages

Even though tasks performed by AI robots are expected to theoretically error-free, there have been some drawbacks when we compare it to a human with a medical degree. But no disadvantage of the AI systems can outrun these advantages:

1. It is almost unimaginable to expect the medical specialists to always remain updated about upcoming scientific information without the assistance of any technological help. The introduction of artificial intelligence into the healthcare industry would help the doctors and nurses in the treatment that is sketched.
2. The treatment provided will be hassle-free and comparatively cheaper.
3. Considering the constantly updating and revising algorithms that will be designed by experts, there are very thin chances of a treatment taking a wrong turn and turning fatal.
4. If AI is equipped with an efficient algorithm and working procedure, it can treat patients far more precisely and reliably than a human doctor.
5. In the absence of doctors, chatbots play a huge role in the primary level of treatment. Though they completely cannot substitute a human with a medical degree, chatbots have turned to be efficient in telehealth, patient interaction, and mental health issues.
6. AI technology can be implemented to replace humans in medical departments concerning insurance claims and financial issues. Specially designed software can be used to cross-check multiple databases and verify them. They can be also designed to calculate bills without any human assistance.
7. AI technologies can be used to predict the upcoming health risks keeping in mind the consistent degradation of the environment. Thus, it will also be able to find ways to prevent or cure those infections or diseases.
8. Round-the-clock medical assistance can be provided for patients pre-surgery and post-surgery. They won't even need to manually schedule or book appointments. Starting from diet-charts to medicine reminders, it will be a part of the system designed.
9. Revelation and development of crucial data in clinical data will help the medical care experts to show up at suitable clinical choices and improvement of personal satisfaction in a variety of patients.
10. AI's capacity to gather and deal with large information, and its expanding adaption by clinics, research centers, drug organizations, and other medical care foundations, are expecting huge growth in the socio-economic condition of healthcare industries.

Conclusion

Adoption of artificial intelligence in the field of healthcare, especially in an over-populated developing country like India, would bring a huge change. The most challenging concern of providing a bare minimum healthcare facility to every citizen can now be resolved easily with the help of technology. Once all the hospitals and medical centers install these technologies into their way of working, it will help both the patient and the doctor. Medical services would then be accessible to almost everyone and comparatively cheaper. AI will not only change the way of the treatment but the whole procedure of diagnosing, treating, and after-care. The complete adoption of AI will be a lengthy process and might include a handful of drawbacks as well. We're still unaware of how patients might react to a treatment procedure with almost no human-human interaction. The hype about AI assistance might be technologically appreciated but it will never able to replace the emotional components.

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INNOVATION IN DRONE TECHNOLOGY TO SAVE THE LIFE

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Introduction

Margaret Rouse, (2019) Drones are generally known as unmanned aerial vehicles (UAV's) or unmanned aircraft systems (UAS). Drones can be regulated by remote or we can elaborate a software to run a drone. At the outset it was used in military operations and it was very effective in rescue operations.

DIVYA JOSHI, (2019) Many governments are using drone technology for various purposes. It helps in the advancement of agricultural sector, to predict the weather conditions and in rescue or search operations. In recent times the drones are also using for dispensing the online products successfully. Drone technology has been instigating in many sectors like telecommunication, spacer search, journalism and also for advertising, crime control and hospitality. Drones are now embedded with many sensors which are useful to recognize the state of weather, different types of crops grown in agricultural lands, underground water level, mineral ores in the underground and lot many things. Drones with thermal sensors has a knack to track the movement of various viruses or bacteria in an affected area. Drones are now used for many viable purposes rather than for military operations. Now a day's drone technology has been rallied and helping the victims of natural disasters by providing food and medicines and it also helps us to know the damage caused in the affected area. Drone technology in medical research helps in transporting blood samples, vaccine, medicines to the victims in remote areas very quickly. It is also used by telecommunication network to record live sport events etc. Climate change have a large impact on health of world wild life. Drone technology is used to find the endangered species and follow them it shares the information about their life condition and monitor them without disturbing their life. Drone technology is also now increasing its ability towards the management of waste which will be helpful to clean the rivers and oceans. It is also helpful in monitoring the construction planning.

RAYOMAND ENGINEER, (2018) In our day-to-day life we face many emergencies. Burns and scalds are common emergencies which are caused by dry heat and moist heat respectively. Heart attack which causes due to the blood coalesce in the arteries which supplies blood to heart. Accident is a major emergency in our daily life where victim face heavy loss of blood and suffer with severe injuries. In present situation COVID -19 is a worldwide emergency.

Correia, H. R., et.al., (2020) Emergency Management is a difficulty and convoluted task but by implementation of drone technology it became easy for the government to handle the emergency situations. Drones are very helpful in detecting the affected area and delivering the elemental things to the needy people. The images taken by drones during fire accidents or leakage of gases will be helpful for experts to execute the opposite plan. Drones will be helpful in supply of essential medicines and vaccine in very short span of time.

Literary Survey

Balasingam, M. (2017) Initially drones were used for various military functions but with many new advancements in drone technology it is now majorly very helpful in saving the lives of many people who are living in remote areas and those who are suffering with lack of medical facilities. Drones can save the victims of the natural disasters by

transporting the food and necessary medicines. It is also have been used in the fight against viruses like HIV and also TB which have been a major issue for many countries. Ground based drones are embedded with latest technology called Artificial Intelligence to reduce human efforts. There is a problem in storage of a sample drug and transporting it in diverse weather conditions due to this there will be an alteration in temperature which effects the efficiency of the drug and leads to serious problem to the patient so the objective of the current research is to improve this technology which is both eco and human friendly. Modern technology should be employed in order to design a drone which also understands the people reactions so that it decreases the threat to the human lives and helps in the implementation of tele medication.

Konert, A., et.al. (2019) Drones are very helpful to analyze the damage caused by the natural disasters and also to help the injured soldiers in rescue operations. It will be helpful in cloudy conditions which will be very difficult for helicopters. Although it has a lot of facilities, it has some limitations that includes dependence on weather condition, load capacitance compared with ambulances. Since land transportation is cheaper than air transportation which will be the majorcurb. So, the drones are to be designed as such as it should decrease the expenses of the government. Drones which are pilotless aerial vehicles are helpful in rescue operations and to play an important role in military and civil emergency medicine. In drones the recorded video can be played back again. Drones are also very helpful in transporting blood samples without any much delay. Drone technology for medical use brought many changes such as quick response, also decreases the time of travelling to the patient, reduction of complications to the victims or patients and access to reach the places where there is no mode of transportation.

Euchi, J., (2020) COVID-19 has compelled the world to implement a new technology which influenced the widen use of drones, it especially helped in delivery of medicines for medical home centers. Implementation of robotization and automation in this pandemic situation. The use of drones for real time scrutinizing and information. In recent years drones have changed a lot, it's proficiency in technology is increasing tremendously. It helps in reducing pollution. But adverse weather conditions have negative impact on drones. The outbreak of COVID has influenced the world this made us to provide drugs and amass blood samples with the help of drones. Many governments are using drone technology for testing people for dangerous viruses like HIV and COVID. It will be very helpful in providing food to needed people in this pandemic time. During this pandemic situation drone technology helped a lot in testing and tracing the affected people. It is also very helpful in disinfecting the places to fight against the coronavirus. It helped the government to detect the affected people.

Poljak, M., Šterbenc, A. (2020). Drones which are versatile aerial vehicles are useful in industries, publicsafety, delivery of goods and for lot many medical purposes. It is also monitoring the deforestation for the conservation of wild life. Many reports prove that drones carrying blood samples and medicines at room temperature has no change in its chemical properties. Only few changes take place which are all neglected. Technology is being developed by many countries to increase its payload. It has been proved that drone-based transports are cheaper and faster than land-based transportation for the delivery of medicines and vaccines. The tremendous use of drone technology can slowly replace the use of satellites. In recent times there is an enhancement of drone technology in clinical microbiology and on infectious diseases. Drones has some obstacles in transportation during harsh weather conditions. And moreover, there is no such innovation in drone technology which is capable to oppose the hijacking. This drawback in drones could be dangerous while it has been used in military operations. Although it has some security issues to use such drones in military missions but it became the only option to use. But drones helped in the implementation of health care in many countries of Asia and Africa.

Karim, S., et.al., (2017) Innovation in drone technology is helpful in condensing the crime rate in the world. It is very difficult to catch the suspects of the crime by police as they escape soon. By the improvement of various sensors in drone it can recognize the face, number plate of a vehicle, weapons etc. These drones are now decreasing the human efforts. It helps in observing the crime activities in the isolated zones like tribal areas, forests and deserts. Now it is also helping to fight against terrorist attacks such as bomb blasts etc. Many countries are now trying to fabricate a drone which run with the help of solar energy. As these drones are for crime control, they will be small so that they can wander in slender streets and fixed with HD cameras to detect the criminals. Using of drone technology for detecting criminals and help the police to maintain public safety with less efforts. It has some drawbacks in detecting the weapons in shadow regions. Hence researchers are analyzing these drones to recognize the things in shadow regions. Drones are designed with different algorithm for different weapons in order to detect the illegal weapons thus it can decrease the crime rate. It also has real time detecting and decision-making technology. These drones use a method called hand shaking method which means when a criminal escape from one drone zone to another drone zone then the first drone passes the monitoring operation to the respective zone drone.

Cawthorne, D., Robbins-Van Wynsberghe, A. (2019) Frugal drones are used for the transportation of blood samples which do not have cameras in concern with the concealment of the public. Many countries are boosting the drone technology to reduce the expenses in medical sector. Recently a new design was adopted by drones in Denmark which is known as Value Sensitive Design (VSD). VSD reinforces the human values and follows philosophy .It is also have been developed with emerging technologies like Artificial Intelligence and bio-technology .The main aim of VSD is to design a drone which is more beneficial to humanity and not to harm the human life although it has some privacy issues it need to be improved for future generation. As the technology need to be improved it requires many researchers to make it happen so it indirectly offers employment to the jobless engineers. Elders who face health risks will be benefited with these drones which carry blood sample for testing and to bring essential medicines. The focal goal of frugal drones is to decrease the transportation costs for the government. So, these drones work with renewable sources like wind and solar energies. Hence, they are slow and light -weight to ensure the safety measures. It carries the blood sample placed in cargo bay which can only be retrieved by hospital staff without any privacy issue to the patient. To restrict the use of drones near airports 'Geo-fencing' is helpful. The main task of the drone designers is to make ensure that designed drones are taking care of public health and to be improved.

Advantages

1. Drones are helpful in transportation of fundamental medical supplies and carry blood samples to the hospitals for testing.
2. Novelty in drone technology cutbacks the travelling time of practical emergency service to the patients.
3. Drones are supportive to deliver the largescale loads like organs on time and at the low cost.
4. Drones can travel where there are no transportation amenities and it can reach the victims who are living in tribal areas.
5. Drones are very helpful in military operations where it provides the medical service instantly to the injured soldiers.
6. Drone technology helps in finding out the victims of natural disasters and provide cardinal things like food and medicines.
7. It helps in rescue operations to find the victims who stuck in forests, seas, mountains etc. and provide them the food and help them out to find the right way.
8. Drones are used for monitoring of areas where biological and chemical hazards occur.

9. Drones helps the forest department to find out the endangered and rare species and sustain them.
10. For the new innovations in the drone technology many engineers are needed hence it provides employment to the jobless engineers.

Conclusion

In countries like India where there is a gigantic population drone technology helps in distributing the essential medical services in a short period of time with less expenses. Since it is a challenge to a country like India to distribute the vaccine in this pandemic situation drones are the best way for the supply. Drones will be very helpful to trim down the crime rate by helping the police which is a key challenge to a populated country. Drones will be helpful during the natural disasters by providing the food to the large number of victims which will be grueling to do by the humans. Drone technology is very helpful for common people for medical emergencies as it is cheap mode of transportation and it can reach the people living in narrow streets and who belong to tribal areas within the time. As the aged people feel hard to go out to get the medicines drone technology helps them out by providing essential medicines and collects the blood samples of the patient. Innovation in drones helps in increasing the job opportunities. Drone technology is very helpful for each and every living being in the world. It reduces the man power. As it has some security and privacy issues it needs to be improved and developed for the future generations.

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DRONE-AIDED TECHNOLOGY IN HEALTHCARE SERVICES & LIFESAVING ACTIVITIES

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Introduction

Elizabeth Howell (2018). A drone is basically an unmanned or uncrewed aerial vehicle (UAV) which is an aircraft without a human pilot on board, these are frequently used for military purposes. These drones are usually used for missions which are dangerous for humans to execute them, mainly in military operations, they are also used in many other applications like surveillance, aerial photography which includes wildlife photography, delivering packages and for some infrastructural inspections. While drones serve a variety of purposes like in photography, military and commercial use, their main basic functions are flight and navigation. Battery or fuel is used as a power source for their flight whereas rotors, propellers and frame are a complete package for navigation.

Balasingam, M. (2017).Natural calamities are unexpected and can cause serious damage, many people are affected and they need to be taken under consideration by providing food and several medications, this is the time where drones come into action. They can be used to carry food packets and medical supplies out to the people in the affected area where road and rail is not possible due to destruction or improper transportation facilities. Drones have nothing to do with terrain, they can fly according to their capacity, drones can carry light loads of up to 2 kg, and move at speeds of up to 36 km/h, their maximum range is 20 km. In case of any issue regarding technical failure or breakdown, these machines are equipped with parachutes so they can safely fall on to the ground without destroying the cargo attached to them. This ensures the measures taken to ensure that the package remains safe even if any problem persists.

Fig. 1. A picture of a typical healthcare drone

Konert, A. et.al. (2019). Drones are more cost-effective and efficient than the current delivery methods, it thereby decreases the delivery time which is the most important thing during emergency situations. Several studies have stated that drones are safe for delivering blood samples, in case if a person is in need of a particular blood group then receiving the package through road transport takes more time whereas drones can do the work faster and complete the task efficiently. In many hospitals blood samples are delivered by drones which prove to be faster and reduce risk factors. The use of drones in medical purposes brings many advantages such as instant help, shortening the time of travel of medical supplies to the patient, like reduction of complications faced by the patient in case of an emergency. Through drones there is an opportunity to reach places which are inaccessible by rail or road, especially blocked roads. In 2015, search and rescue services delivered life jackets to people trapped on rocks in the middle of the Little Androscoggin River in the state of Maine.

IBERDROLA, (2020). Drones can be used in fire fighting; they can participate in such kind of operations by carrying water up to 300 litres. Drones can be used to inspect power grids, they may be in

places which are hard to access manually, and these drones can provide footage so that it gives the workers an upper hand. Drones can also be used in rescue operations to locate missing persons and provide food packages to the survivors due to their miniature size.

Many contagion regions which are quarantined and are under lockdown should not be accessed by people directly as it may lead to spread of that particular disease and increase its intensity, so in such case it is a great option to use drones if we have to supply medications or food supplies, they can be sanitized and are contact-free. Covid-19 has made and is been making such a devastating impact on the lives of the people. People are to maintain social-distancing and undergo proper sanitation to ensure that the virus or disease causing microbes won't transfer from one source to the other, patients can be provided with proper medicines at their doorstep if they are self-quarantined so that they no need to travel beyond their homes in search of medication which may have a chance to spread the virus causing microbes. This method can even be applicable for transporting food.

In other case these can be used by the cops for proper surveillance in spite of having CCTV's, they can be more accurate as our latest technologies are involved in upgrading them to the core to get the best results out of them. Low costing drones combined with lightweight and heavy-duty video cameras have a wide range of uses, their superior vision even in poor conditions or in low-light and extreme performance is such a great aspect to consider. In this generation, drones have been a part of our life it may be for commercial use or any other emergency applications vast research and development in this technology is improvising its results through artificial intelligence and many other perspectives.

Literary Survey

I. Drone classifications

Washington, A. N. (2018). Based on the organisation, drones are classified into various number of categories referring to the size, capacity and range. Small UAVs (often referred to as micro-UAVs) have shorter ranges mostly till the line of sight up to 100 kilometres, in fact they are not capable to travel more further. Their price range varies from $100 to $100,000. Due to their small size they can be carried in a backpack. They are easy to operate because of their miniature size and as they do not require more place for take-offs and landings.
Due to their affordability and high portability they are widely used to solve many problems worldwide.

Maria Gaia Pensieri, et.al. (2020). Drones can be categorised based on their specifications and their properties, there are many drones some are used for entertainment purpose while some are used for important tasks such as rescue operations and healthcare while heavy operating drones are even used in military operations.

The Three Main Categories of Drones

1. Propeller structures - multicopters
2. Planar structures - fixed wings
3. Hybrid technology - aircraft

Classification of Drones by Weight and Size

MAV (Micro Air Vehicle)	Maximum Length of 15 cm
sUAS (small Unmanned Aircraft Systems)	Weighing less than 25 kg
UAV (Unmanned Aerial Vehicles)	Weighing more than 25 kg

II. Drone Applications

Some of the drone applications are:

- Delivering vaccines.
- Health aid packages.
- Medical supplies to remote/contagion areas.
- Providing safe transport of disease test samples.
- Wildlife monitoring.
- Active shooter response and many more.

Drones have become more part of the research and technology due to their vast applications in various sectors, such as security, control, monitoring, exploring terrestrial areas which are hard to access

and by helping smart cities to meet their safety requirements. The most impressive application of drones is to collect data from IoT using wearable devices in smart cities in order to improve public safety and economy. These drones can communicate with heterogeneous devices on ground which is normally unable to transfer data over long distances, this may improve services thereby leading to better outcomes. The Internet of public safety things (IoPST) mainly refers to wearable things which are connected through internet and are widely used in public safety. Drones play a major role in this process due to their high accessibility and reduce the risks of certain threats and activities. In the smart cities' technology is used to integrate drone's technology with many other technical wearable devices which provide accurate information for the well-being and to have complete accessibility of the city in a judicial way, cops are able to put their surveillance in a more accurate way with the footages provided by the drone.

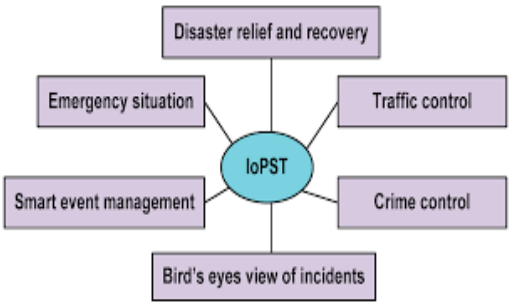

Fig. 2. The IoPST concept

The Use of Drones to Search Missing People

Commissario Straordinario del Governo, (2020). We all know where drones are widely used but here, we will discuss how it is used in case of search and rescue operations which are mainly considered to save lives even when there is a huge risk. Drones are used in several missions to spot the survivors accurately. Drone systems are been refined worldwide as they are going to be almost a part of the society in the upcoming days, research is been done to ensure that they will be able to meet the new and upcoming challenges, which will be thereby solved without raising any issue. There are many terrains which are hard to access where these drones come into action, they show the detailed view of the particular map which is further inspected by the rescue team so that they can plan and execute their operation flawlessly. The rescue teams need to be properly trained in order to be guided by the drones. They should be under constant training and meet the required flight hours for maximum perfection. The drones are equipped with several sensors which help in spotting people who are in search for help. The night vision sensors and thermal detection feature helps it easier to detect them even in low-light and dark conditions which is the most needed upgrade for a rescue operation which is to be conducted over nights.

Certain drones have great capturing capacity provided with 4K 13 MP HD 3-axis camera for accurate and precise shots of the view, this feature improves the task being carried out especially during searching the missing ones. As per sources a normal commercial drone can be transformed in to a life-saving tool if it is properly equipped with the required add-ons where humans may find difficulty to arrive.

Drones in Fire fighting

Drone Nodes, (2015). Drones are even used for fire fighting, they can carry up to 300 litres of water and are used in scene monitoring, search and rescue operations, in post fire or disaster assessment and also in wild land fire fighting. They are able to locate hotspots and have a 360-degree view angle which makes it easier and more accurate thereby reducing many hazards to life and property. How drones are being used for helping fire departments is shown in the picture below, fig.3.

Fig. 3. Fire fighting Drone

Advantages

- Drones take good-quality aerial footages like images, recording videos up to 4K, and collecting vast amounts of data. These high-resolution images can be used to create 3-D mapping and 3-D models, which have many uses. For example, 3-D mapping of disaster prone areas can make rescue teams to be more aware before entering hazardous conditions.
- Since UAV's are equipped with GPS (Global Positioning System), they can be programmed accurately to precise locations. This is especially helpful in a variety of situations.
- With advancements in technology, most drones can be deployed and operated with relatively less experience. Combined with the relatively low cost models, drones have become accessible to a wide range of operators. UAVs also have a greater range of movement when compared to a manned aircraft. They are able to fly lower and in more directions, allowing them to easily navigate even in hard-to-access areas.
- With the appropriate license, operators can use drones to provide security and surveillance to their private companies, sporting events, public gatherings, and other venues.
- Time of flight, the average flight time is a couple hours and can go up to 16 hours or even more if the drone is gas engine powered, it depends on the engine which we use.
- They are built strong and are durable.
- **Easily to transfer data.**
- Drones come in various sizes, providing a wide selection to suit depending on the needs.
- UAVs equipped with obstacle avoidance capabilities which help them to navigate more efficiently and allowing them to capture minute details without any issue.
- **Drones minimize the risk in healthcare sectors.**

Conclusion

In a developing country like India, in spite being one among the most populous countries drones can be a vital source and a life-saving tool. Even though they have gained a great possession as a weapon and advanced technologies in the military, there has been a rapid rate of succession in life-saving activities. They have immense contributions in various attributes leading to public safety which is the major problem to deal with in an upgrading society. These drones can be used in both rural and urban areas for many activities like carrying aid or medications. It is easy to access under proper training and the drone controller must have the license issued in order to fly it otherwise it is against the law. Small commercial drones don't require a license but the ones which are heavy and multi-functional are to be verified. There is a lot of progress in this technology as it is more liable and does not require the things to be done manually, the rapid growth in computing and integration with the drone technology has given imaginable outcomes which are been carried out and tested. There are many problems too if not rectified may lead to serious hazards, the rules are implemented in order to safe-zone them. Smart cities use this drone technology to have more connectivity among themselves and thereby providing more security. The use of drones in medical sector has brought many advantages by reducing the delivery time and reducing the risk of the patient's health, there is a standard progress thereby making it a more often mode of transportation of various medications for hospital services. The applications of drone technology are widespread by integrating IoT along with them making it far more accessible and more convenient in developing and smart-cities.

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NEED FOR ENERGY EFFICIENT TECHNOLOGY IN HEALTHCARE AND AGRICULTUTRE INDUSTRY

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Introduction

Energy is the fulcrum of all activities as we are dependent on energy to carry out any activities. Energy efficient means the utilisation of energy in the most effective manner to carry out any service which is beneficial for both humans and the environment. It aims to carry out any energy dependent activities and also makes sure that the negative environmental impacts due to energy consumption is minimized. The ubiquity of technology has impacted us in every aspect of our life, utility of technology which is energy efficient may provide a way for sustainable development, so that the present needs are also available for future generations. Many industries or firms must focus on utility of technologies which are less energy dependent for probable cost savings. The input must be always smaller than the output, thus maximising the benefits of energy and saving our environment. People at higher positions in the industries must motivate people to come with ideas to save energy in a synchronized manner. There must be workable balance between demand and supply. Therefore, Conservation of energy must be our top most priority.

Sundar, K. (2019, October). Globally energy efficiency aims to improve our energy security. Energy can be saved in our day to day life. Prominent example is incandescent light bulbs which are used by many consumers because of its low cost but it has higher energy costs as well as their low life span. This bulbs can be replaced with led bulbs which are more compact and have long life span. Energy efficient buildings with passive infra reeds can be used to switch off the lights when the particular place is unoccupied. Buildings with proper location and surrounding and usage of double gazed windows can save energy. Infrared radiation heating technology can be used for any traditional methods. Industries can use proper combustion, insulation, instruments, burners which are well maintained for minimising the usage of energy. Fuel switching a process in which one fuel is substituted for another. There are many applications which can be used to save energy like using gravity for pumping system, in household we can have auto sampler for mineral processing, high transmission of voltages, clean coal process a modern technology which will not only conserve energy but eliminate pollution. Artificial intelligence and IOT can be used to build smart cities with all facilities in terms of health, transport, communication, etc. People must also be aware of the recent technologies which would provide a way to conserve the energy.

Prasad Bhukya, Dr. Debasish Basak (April, 2014). Industries in current scenario use a lot of energy efficient technologies for conserving energies, low cost, capitalisation. Industries have started using mechanical and thermal compression technology for evaporation process that consumes the latent heat released mainly in dairy industries. Cogeneration technology in which heat and electricity both are produced cumulatively especially in natural gas plants. Increasing the power factor can conserve huge amount of electricity with the help of streamlining, replacing, reducing, restricting the load on the engines and motors. Solar light pipes, soft starters, energy efficient engines, eddy current devices, fluid coupling, transformers are some of the existing technological systems which are being used

in the industries to rule out high input and less output. We can adopt renewable sources of energy like solar, wind, water, biomass which definitely will be of greater importance and fruitful for the upcoming generations.

Literary Survey

Muqeet, M. A., & Akbar, M. F. Electricity is the most needed thing in our day to day life. We know that the consumption of electricity is increasing exponentially with population but other sources cause pollution due to production of pollutants and maintaining of these pollutants is an expensive task. So, we have come up with a hybrid system. By incorporating three energy sources together we can develop a reliable hybrid energy. The system consists of solar panels, wind turbine, piezoelectric sensors. These system have greater advantage than other non-convectional energy sources. The system with a lower installation cost and also the power generated is stored in a battery further this battery converts DC to AC supply, so it rule's out the problem of unavailability of power at all time. Piezoelectric material cause vibrations which are converted into the electrical charge via piezoelectric effect and electromagnetic induction. It offers reliability, efficiency, less emission and lower cost. During abnormal conditions one of the source stays active, while during normal conditions they act together. So these is the best method for any energy efficient technology which can be useful for our services.

Xuemei Guo. As urbanization is accelerating, construction projects are increasing to meet the needs of the people. The objective is to apply energy efficient technology for construction of building water supply and drainage to provide services in such manner that the negative effects on the environment are minimized. In today's era the economic development has improved the living standards of the people, with the increase in demand of new technologies to provide services to the people. Today's drainage system operates ventilation technology to dissipate gas in order to reduce the noise but application of such technology has negative impacts on the environment and may lead to wastage of the resources. The drainage system in most of the countries in not perfectly implanted with excessive pressure on the water supply there is huge loss of water resources. As most of the systems are cloaked the maintenance cost of such systems are huge and can lead to greater economic losses. The leakage problem is also contributing to loss of resources due to obstructive design, improper maintenance and poor techniques. Application of vacuum water supply saving technology mainly focus on to save water by the utilization of drainage system. The components of water saving technology are water suction vacuum valves, sealed pipes, vacuum collectors. The dogma is to press enough air into the vacuum system this method has improved and helped in conservation of water resources. Variable frequency speed control water pump is also a technology which acts as a decompressor device which turns off the power of water supply, so that overpressure can be avoided, the application is that it controls the speed of the water pump, so that the constancy of switching of water pump is reduces this helps to consume less power. It also saves energy and reduce the investment required to purchase water tank. Many other technologies with broadening advantages can be used to conserve the resources like municipal water pump network pressure, separation of the living water supply system and the consumption focus on water conservation. Such technologies with innovative frame work can be successfully stitched to our everyday life, so that we conserve resources for our future generations.

Jaidka, H., Sharma, N., & Singh, R. et.al (2020). Internet of things was invented by Kevin Joshua. Applications of Internet of things have been an eternal part of our life with the help of IOT the devices have been able to exchange information with each other and perform the activity. The industrial internet of things is the centre of attention to industrial applications like products, manufacturing, sensors, resources, energy management, computers etc. IIOT technologies are applications are security, cloud computing, robotics, IOT. Internet of things

have many features like connectivity in with IOT and IIOT are connected to each other by cloud for better speed and directional communication. Device Virtualization establishes connections with IOT which helps to track the path of the data from where it goes and come. IOT devices are heterogeneous due to unsimilar hardware platforms which helps to make a smart device. IIOT has wide range of applications in manufacturing , it helps in data collection and redistribute the services to the customers, it also reduce product waste by 10% ,so there is fast transfer of data between producers and the consumers. In agriculture IIOT plays a major role assembling the data of rainfall, speed, soil fertility, for better productivity IIOT refines crop quality and crop management methods. It is also used as ocean of things which help to gather the data from the ocean by assembling , inspecting the aquatic environment data. It uses low cost floating sensors and underground wired cables to transfer the information. IOT is used in health care industries to gather data from various body parts it is popularly know as smart healthcare system. We have IOT devices use in our day to day life. Transportation system has be enhanced with the help of IOT, every cameras and sensors have be incorporated with this IOT technologies. IOT face many challenges. Analytical challenges in which it is necessary for the data analytics to inspect and process the data. Data storage Challenges are also face by many companies, no companies use methods to tackle data so, it necessary to compel and secure data storage. Security is the top most priority of any enterprise or a company to keep their customer data safe. There are many threats and hackers who try to encrypt the data so it is compulsory for the company to secure data and even if they want to regain the lost data the company have to bear a huge maintenance cost and would imbalance their economic growth. IOT and IIOT are emerging business tools in the technologies for economic growth.

Badri Narayan Mohapatra1* and Prangya Prava (25-February-2019) .Machine learning is an application of artificial intelligence. The main focus is to use machine learning applications to build smart cities. The problems face are too much of algorithm and theoretical challenges. Each application needs to be specially trained. It faces problems with variety, volume and big data management. Machine learning has become remarkable in application like medical diagnosis and computer vision. It provides improved services like health, transportation, energy, etc. it plays an important role in agricultural sector, linear regression, ground water mapping and nitrogen estimation helps in improving the productivity. Different algorithms of machine learning are used to achieve the objectives. Deep learning has a new set of benchmarks in radiology, cardio diagnosis, neurology. Machine learning has capability of image processing such that radiologist can handle more number of cases these has helped radiologists to exploit the opportunities provided by machine learning. Health care systems of many countries are adopting machine learning, AI, deep learning to improve fatality rate. Machine learning is also responsible for cardio and pneumonia diagnosis, this system identifies the image and gives an idea to focus on area which are affected, so machine learning is a big giant to carry out health services. Machine learning has also been used to conserve environment like ground water mapping, solar radiation, energy management etc.

P. S. Aithal & Shubhrajyotsna Aithal. With the increase in population the demand for new and energy efficient technologies are growing. Many technology are beneficial as well as are harmful to the environment and consume large amount of energy, so we need to develop an ideal energy like ideal engine, ideal engine, ideal sensors, ideal motors etc. Ideal technology must be reliable and cheap so that anyone can afford to buy the products. It must be energy efficient and the negative impacts on the environment must be less. It must also provide services to the customers, solve their problems and provide comfort to the customers. Long lasting consuming less power, large potential and flexible to any situations. Ideal technology is nothing but green technology such technologies must be used in every

industry or enterprise like aircraft, automobile, healthcare, IT, etc. so that the impact on environment can be minimised. In green technology we used natural resources to generate products which reduce environmental damage. In automobile industries green technology must focus on zero emission of greenhouse gases by using renewable resources. Machine learning and AI can be used to develop green technology as the ubiquitous of machine learning is a trending technology among other technologies. Nanotechnology can we used as green technology in agricultural, health, education sector. It can solve our problems by providing energy efficient fuel cells, solar cells. Sensors which can be used for sustainable development. Nanotechnology in health sector can be used to develop certain medicine and focus on pharmaceutics and also nano robots can be used for operations. Education sector must create green jobs and every graduate must focus on sustainable development. These technologies can change the lifestyle of the people.

Advantages

1. IOT in healthcare industries can be used to collect data which can reduce the unnecessary tests, reducing costs and minimizing human error.
2. IOT connected to healthcare systems can help patient with better experience during diagnosis and minimize the workload for doctor as they have the data of patient in their hand.
3. Using IOT we can minimize other resources which can be harmful for the people and can be used in middle east and African countries with low health care industries.
4. Green technology has no adverse effect on the environment it uses devices and software's that reduce energy consumption and save the environment.
5. Nanotechnology has improved the existing technology, it has be used in batteries, solar panels, gadgets to minimize energy consumption and also improve the efficiency of the products.
6. Nanotechnology as green technology has the ability to remove to detect, neutralise and filter the chemical waste present in the ground water and neutralize the waste water generated from industries.
7. It can help farmers detect the soil fertility, the water availability in the ground, amount of good produced, quality of the crop and also helps to identify different viruses which can affect the productivity.
8. AI in agriculture can provide robots and gadgets to keep the pests away from the crops, helps in weather prediction. AI can be used in motors, engines instead of fuel as it harms the environment.
9. Piezoelectric devices or sensors are reliable, energy efficient, low cost, small shape and can be designed in any shape, outcome has high frequency these can be replaced with devices which emit radiations or use harmful resources.
10. AI has the ability to process information in more effective and faster with less human error. AI in healthcare improves the communication between the patient and the doctor. It is used in various diagnosis. It can aid patients by early detection of the diseases by collecting the vitals of the patient.

Conclusion

Technology has affected the surroundings, society and environment in many ways and has also helped in growth of global economy. As, there is growing demand for the need of energy efficient technologies which can be used in agriculture and healthcare industries and replace the existing technology which had adverse effects on the environment. Country like India must focus on energy efficient technology. Indian government must take necessary steps to improve the life style of the farmers by educating them with usage of such technologies and also focus on healthcare facilities. IOT, AI, green technology etc, such technologies can bring a broad change in life style of the people and they would even focus on energy consumption. Sustainable development has always been an aim of any country. More development and research is still needed in this field in order to increase the reach of these technologies to

common people. Many challenges are faced by such technologies like big data management, variety, velocity, reach among common people etc. These technologies can shape and structure the Indian economy and also reduce environmental problems faced by the country. The paper discuss about various technologies which are energy efficient, can beused in our daily life and help under developed countries potentially increase the growth of their country.

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THE ROLE OF DRONE TECHNOLOGY AS RESCUER OF HUMAN LIVES

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Introduction

Chamayou, G. (2015). A drone is an Unmanned Aerial Vehicle or UAV which is an aircraft or a spacecraft without any pilot. It is a part of the Unmanned Aerial System. It moves in a particular direction as controlled by the radio signals. It can be remote controlled or set on automatic piloting.

Divya Joshi,(2019). Drones are used for varied purposes such as:

1. Defense: Military drones are used by the military forces and the smaller versions are used by the ground forces to tackle everyday scenario. Drones help to obtain information from important locations and keep the armed force ready accordingly.
2. Emergency Response: Drones inbuilt with superior cameras are used in rescuing victims from dangerous locations by identifying them with the help of these specialized drones. At times it becomes extremely difficult to reach to the desired location on time which might risk the victim's life.
3. Weather forecast: Drones are used to capture data and study the weather pattern and thus helps to predict any upcoming natural disaster or calamities like tornado, volcano, hurricane. Thereby, the weather forecasting department is able to warn the people of the particular location.
4. Tourism: Drones are used to provide room service by transporting luggage and delivering packages to the customers.
5. Journalism and news coverage: Drones are used to collect information and photographs from disaster locations and other places where it might be difficult to for a journalist to reach in person.
6. Gaming: Drones are used to prepare maps for various video games and to provide realistic game play. Ronald Francis,(2016).
7. Conservation: Conservationists have found out ways to protect wildlife species from getting extinct. A huge number of animals go extinct due to poaching and climatic changes. Thus, drones with geospatial imagery are used to track animals and look after them.
8. Healthcare: Drone technology is used to transfer medicines, blood and other medical equipment from hospitals to emergency locations. In case of emergency, it might not be possible for a person to take the victim to the hospital on time, thus drones play a huge role in such cases.
9. Construction planning: Drones play huge role in tracking the entire construction phase along with ground inspection.
10. Internet: Methods are being developed to provide internet in rural areas via drones which can easily access those locations.
11. Drones for real estate: Real estate officers use drone technology for aerial photography of mansions and skyscrapers. This method of capturing information brings about huge profit for the officers.
12. Agriculture: Drones play a huge role in the agriculture industry. The first drone to have performed tasks in the field was developed by Yamaha motors in Japan. Drones are used to spray pesticides and insecticides in the field.

Emergencies can arise at any moment in our lives. Emergency situations in our day to day lives are: Medical emergencies, Disasters, accidents etc.

Divya Joshi, (2019).Some of the emergency situations can be tackled with the help of drone

technology. Emergency situations in our daily life includes medical emergencies like chest pain, heart attack, accidents leading to blood loss. These situations require immediate transportation of medical equipment, blood etc., which is done with the drones enabled with sensors to detect emergency locations very fast. Disasters take place around the world which leads to emergency situations. At times, the victims have to be provided with food and water which is transported via drones. Military forces utilise drone technology in order to keep the country safe from its neighbours. Drones with their cameras and sensors identify any intruder who might cause any harm.

Drone technology with various features like image sensing, signal processing helps us to lead our lives in a better way. Be it in an emergency situation or luxury time, it provides us with immense help Also, scientists are looking forward to utilise drones for space missions. In the next ten years we might get to see drones take over pilot-based aircrafts as they are much more advantageous. They will reach unreachable locations and procure information at the same time eliminate the risks of endangering life of the pilots.

Literary Survey

Rabta, B., et.al., (2018). **1. A Heterogeneous Drone Model with Recharge and Drop-off Stations for Emergency Humanitarian Operations**

1. **Problem**: Recently, developing countries have seen a sudden increase in the number of natural and man-made disasters taking life of many people. Urbanisation and overpopulation lead to shortage of land in developing countries which are disaster prone areas thus increasing the risk and leading to a greater number of victims when dreadful disasters hit. 2. **Uniqueness:** The drone model focuses on the ways of implementing various features which are applicable in real time disaster situations and at the same time keeping in mind the limitations of the drone.
2. **Solutions**: i) Various types of drones are taken into consideration having various technological properties. ii) Recharge stations are developed in order to allow the fully loaded drones to reach their remote locations. iii) Drop-off locations are developed to save the energy of the drone.
3. **Methods adopted**: i) The combination of various drones and land-based transport systems are used. ii) At times, the fully loaded drones are unable to teach their final location at a go. Thus, recharge stations are installed in schools and other public locations where solar energy is made available during complete breakdown of the infrastructure. iii) Disaster locations are segregated according to their immediate needs and thus helped according to the prioritized location to end the relief distribution faster.
4. **Short summary**: The risk factor in the disaster-prone areas can be reduced by implementing various realistic features of the drone technology keeping in mind its capabilities as well as limitations.

Pensieri, M. G., et.al., (2020). **2. Drones as an Integral Part of Remote Sensing Technologies to Help Missing People**

1. **Problem:** In Italy, around 61,036 people went missing from 1 January 1974 to 31st December 2019.Thus, the higher authorities of the country wanted to implement drone technology in order to find missing people whose number is increasing every day.
2. **Uniqueness:** This model focuses on implementing drone technology for search and rescue operations of missing people. High quality drones with remote sensing technologies like GPR and efficient rescue team is the key point of the model and is believed to work like magic.
3. **Solutions:** i) Aerial drones, marine drones and robot drones are designed with the help of artificial intelligence which would ease the rescue operation by reaching rough and difficult locations. ii)The drones are proven to work like miracle in inclement weather conditions. iii) The drones supported by the remote sensing devices help the rescue team reach the desired location after detecting it in very less amount of time.

4. **Methods adopted:** National digital registration systems have been introduced on the D-Flight websites to store, retrieve and exchange information relating to the drones and its various regulations.
5. **Short summary:** As per the records, huge number of people have gone missing in Italy. So, drone technology supported with remote sensing devices have been implemented to rescue the missing people.

Balasingam, M. (2017). **3. Drones in medicine—The rise of the machines**

1. **Problem:** Insufficient medical equipment and medicines for various life-threatening diseases at a particular place and time where the materials are required at the earliest. It makes the situation more troublesome for the patient.
2. **Uniqueness:** This model focuses on supplying enough medical equipment and medicines at the earliest using Drone technology.
3. **Solutions:** i) Medicines, antivenoms, blood products are made available to remote locations using drones. ii) Transportation of organs at the earliest for organ transplant using the drones. iii)Defibrillators are transported to remote locations where a person has suffered a cardiac arrest.
4. **Methods adopted:** i) Drones are supported with GPS trackers to reach the desired location on time without any delay. ii) AED equipped drones are used to efficiently transport defibrillators.
5. **Short summary:** Drone Technology plays a huge role in medical field. Starting from supplying medicines, blood products and antivenoms to transporting defibrillators and organs for transplantation. Thus, medical facilities can be provided to the patients who are located in places that are difficult to reach via drone technology.

Poljak, M., & Šterbenc, A. (2020). **4.Use of drones in clinical microbiology and infectious diseases: current status, challenges and barriers**

1. **Problem:** People living in remote locations get affected at large scale during outbreak of a particular infectious disease covering a large area. Medical equipment, medicines, blood and other sample tests are needed at the earliest in those locations to help the affected receive proper treatment.
2. **Uniqueness:** The concept of **"**Lab-on-drone technology" is the key objective. It will help to transport samples from the affected locations to the nearby laboratories and also deliver diagnostic instrument to the affected area in the limited time span.
3. **Solutions:** Drone technology is used in i) Sample transportation: The drones can transport the samples by using the lab-on-technology concept. Certain parameters should be kept in mind and arrangements made accordingly so that no change in the parameters of the sample takes place. ii) Delivery of important medical stuffs: Blood, vaccines, medicines, organs are transported to the remote locations where the patient is in emergency. A drone delivery programme was first started by the Rwandan president in their country. The name of the programme was 'Uber for blood'.
4. **Methods adopted:** Automated external defibrillator (AED) equipped drones are developed to the patients at a very crucial moment.
5. **Short summary:** Drone technology in healthcare-clinical microbiology and infectious diseases has a huge role to play and will help in making improvement worldwide in the coming years. Certain barriers are still there which might cause delay in its widespread use at present but not in the future.

Restas, A. (2018). **5.Water Related Disaster Management Supported by Drone Applications**

1. **Problem:** Water related disasters like drought and flood impact the lives of people living in the affected area; especially in remote locations where rescue operations are difficult to be conducted. Extreme weather conditions lead to scarcity of water(drought) or excess of water(flood).
2. **Uniqueness:** This model focuses on implementing drone technology in drought and flood management and tracking its path right from its prediction till the relief work is completed.

3. **Solutions:** Drought- Drought affected area lead to higher risk of forest fire. Thus, drone technology can be used to detect fire in the drought affected areas and thus preventive measures can be applied faster and fire can be brought under control. Flood- i) Pre-flood management: drones can be used preparation prevention purposes. ii) Flood-management: During flood drones can be used to monitor the affected location and keep the rescue team well aware of the real time situation. iii) Post-flood management: Drones can be used to study the damages caused in the affected areas and accordingly the rescue team will work.
4. **Methods adopted:** Drone's "eagle eye view" concept helps the rescue force to take immediate decision and progress accordingly.
5. **Short summary:** Water disasters include both drought (scarcity of water) and flood (excess of water). Drone technology can be implemented to detect fire caused in drought prone areas as well as in the three stages of flood management. Its eagle eye view helps the rescue teams to prevent and progress during these disasters.

Karim, S., et.al., (2017, October). **6.Image Processing Based Proposed Drone for Detecting and Controlling Street Crimes**

1. **Problem:** Huge number of crimes take place every day. The crime rate is also increasing day by day. Crimes that take place in remote location, crowded areas and street are difficult to be solved. Identification of the criminals by CCTV cameras and policemen is not possible always.
2. **Uniqueness:** This model focuses on using the drone technology for surveillance, identification of the criminal, finding arms and ammunition used by the criminal in committing the crime and thus ensuring safe environment for everyone.
3. **Solutions:** The proposed drone has two processing units interconnected with each other. The first unit handles identification of the criminals with arms. It uses artificial intelligence to distinguish between the suspects and the police or the military with their arms. It uses inbuilt HD cameras for face recognition of the suspects involved in the crime scene. The second unit controls various operations and helps in proper navigation of the drone. It protects it from any unwanted damages.
4. **Methods adopted:** Shape detection algorithm is used to verify the suspected weapons with the weapons found in the crime scene. HOG is used to analyse the shape of the objects.
5. **Short summary:** The proposed drone model focuses on reducing crime rate by implementing drone technology combined with artificial intelligence, image sensing techniques and control measures.

Advantages

1. Drone technology helps during the rescue missions on the snowy slopes.
2. Drone technology aides in critical ways after natural disaster.
3. Drone technology is helpful for fighting cardiac arrest.
4. Ambulance drones can carry essential medical equipment to the desired location in a very short span of time.
5. In case of fire fighters and rescue squads, drones help to quickly locate the missing people with the digital cameras and thermal imaging sensors and to bring them emergency supplies like water, food, medicine etc.
6. Quality Aerial Imaging: Drones are used to capture high quality aerial photographs which are used to produce 3-D maps and 3-D models of the disaster locations.
7. Precision: UAV's use GPS and thus are accurately programmed to reach the desired location.
8. Security: Drones are used to provide security to private companies, public gatherings etc.
9. Drones are used to monitor forests for illegal activities and thus protect the environment.
10. Drones are helpful in preventing crimes from taking place at different parts of the world.

Conclusion

Drone technology with various features like image sensing, signal processing helps us to lead our lives

in a better way. They capture high quality photographs which are utilized in making 3-D models and 3-D maps of the disaster location. Be it in an emergency situation or luxury time, it provides us with immense help. It carries important medical equipment to the victim's location as well as it is utilised for emergency delivery purposes. Also, scientists are looking forward to utilise drones for space missions. In the next ten years we might get to see drones take over pilot-based aircrafts as they are much more advantageous. They will reach unreachable locations and procure information at the same time eliminate the risks of endangering life of the pilots. As for our country, drone technology can be implemented in various methods which can play an important role in our everyday life. It can be used to monitor activities at various public places, reduce the number of crimes taking place at different places of our country. Thus, ensuring safety of each and every citizen of our country, especially that of women and children.

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BUSINESS INTELLIGENCE IN DAY TODAY LIFE

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Introduction

Guru99, et.al., (2019) Buiness Intelligence is a set of process that includes architectures and technologies that transform into meaningful information that provides a profitable business actions. It is a combination of software and services to transform data into actionable ideas. Business Intelligence has direct contact with organization's strategic, tactical decisions. Business Intelligence tools perform data analysis, create reports and various functions like dashboards, maps, graphs and charts to provide users with detailed intelligence about the business.

The Balance carrers, et.al.,(2019) Business Intelligence is a technologically driven operation, so people who work in BI needs both hard and soft skills. Hard skills are learned abilities acquired and enhanced through practicing, repetition and education whereas soft skills is combination of peoples skills including interpersonal skills. Basic skills that are helpful in BI is database management, survey design, SAS, coding data, critical thinking etc., so skills plays important role in Business Intelligence.

Saptarshi Das (March 28, 2019), Business Intelligence helps to grow our business in various ways such as smarter decision-making process (i.e) BI enables enables in strategic decision making.BI helps in improving the customer service. Business Intelligence helps the business owner in better productivity. Business Intelligence is very helpful in better ROI (Return On Investments).Business Intelligence helps in turning data into actionable information.

Guru99,et.al.,(2019),Business Intelligence have many advantages such as Boost productivity, to improve visibility, fix accountability, it gives birds eye view, it streamlines business processes, it allows for easy analytics but Business Intelligence also have various disadvantages (i.e) mainly cost is main disadvantage in BI, complexity is another drawback in BI ,it also consumes more time which main drawbacks in Business Intelligence.

Guru99,et.al.,(2019),There various trends in Business Intelligence such as artificial intelligence, colborative BI, Embedded BI, Cloud analytics. Artifical intelligence s the capability is being leveraged to come up with real time data analysis. Collaborative BI is combination of collaboration tools including social media and other latest technologies. Embedded BI allows the intergration BI software.BI cloud analytics is will be soon offered in cloud and more business will be shifting to this technology.

Literary Survey

Ahmad, S.,et.al.,(2020),BIS is a combination of technical tools and techniques that provide historical information to its users for analysis, query and reporting that management and significant decision-making. For enhancing the efficiency of business process BIS is used. Additive manufacturing, collaborative robotics, smart factory, augmented reality, data analytics are some types of business technology. The advent of fast fashion interrupted. The industry by demands for quick production and frequent changes in product orders. T&A industry tried hard to harmonize with logistics warehouses, inventories of stores, and supplychains according to customer demand as well as with manufacturing/production plans. benefits of Business intelligence is cost saving from mart consolation. Time savig for suppliers cost for industries,better

informed decisions, improved business processes, strategic objectives and benefits. Business intelligence is used for obtained quality information for decision making, enhanced ability to analyze the expected opportunities and threats, enhanced quality of decision making.

Ukhalkar, P., & Bhosale, M.,(2018),Business Intelligence (BI) is a system of tools and methods that help in strategic planning and informed decision-making. It is the concept that usually involves the delivery and integration of relevant and useful business information in an enterprise. This process of BI starts with extracting raw data and outputs actionable information that when utilized properly, can provide benefits throughout the enterprise. Every business organization, small or big, needs valuable data and insights. When it comes to understanding target audience and customers preferences, big data and analytics plays a very important role. It even helps enterprises anticipate their needs. The right data needs to be effectively presented and properly analyzed. It can help a business organization achieve various goals. Business intelligence challenges and opportunities are Insufficient understanding and acceptance of big data ,Confusing variety of big data technologies ,Analyzing data from different data sources, Complexity of managing data quality Dangerous big data security holes, Measuring the right indicators, Tricky process of converting big data into valuable insights, Troubles of up-scaling ,Lacking a clearly defined BI strategy poor BI functionality and interactivity, Reducing the cost of producing reports lack of company-wide adoption, creating self-service analytics

Mędrek, M., & Tatarczak, A. ,(2017),Modern Business Intelligence (BI) is the process of converting data intoactionable information, using set of software tools, techniques and applications. The aim of BI is to support decisions for an organization, by providing access to existing data. In many BI is used in many areas of many industries. Our focus is to make BI education more motivating and practical for the students and provide the BI lecturer and student with complete learning environment for business intelligence. Increasing importance of data analysis. Growing amount of raw data stored in information systems. Another reason was the difficulties in learning BI techniques arising from the difficulty of Business Intelligence subject and price of Business Intelligence tools.

Olszak, C. M., & Ziemba,(2003), Business Intelligence is now one of the fastest developing directions in IT department. It is supposed that in the future BI systems connected with CRM systems (Customer Relationships Management) and ERP(Enterprise Resource Planning) will provide an enterprise with a competitive advantage .BI is a combination of concepts, methods and processes that aim at not only improving business decisions but also at supporting realisation of an enterprise's strategy. Major main tasks that are faced by the BI systems that combines of all intelligent exploration, integration, aggregation and a multidimensional analysis of data originating from various information resources. Systems of a BI standard combine data from internal information systems of an organisation and they integrate data coming from the environment e.g. statistics, financial and investment portals and miscellaneous databases. They are meant to provide adequate and reliable up-to-date information on different aspects of enterprise activities .

Barone,et.al.,(2010),Business Intelligence (BI) software aims to enable business users to easily access and analyze relevant enterprise information so that they can make timely and fact-based decisions. However, despite user-friendly features such as dashboards and other visualizations, business users still find BI software hard to use and inflexible for their needs. Furthermore, current BI starts the require significant efforts by IT specialists to understand business operations and requirements, in order to build Business Intelligence applications and help formulate queries. In this paper, we present a vision for Business Intelligence that is drived by enterprise modeling. The Business Intelligence Model (BIM) aims to enable business users to be concept on business operations and strategies and performance indicators in a way that can be connected to enter data through highly automated tools. The BIM draws upon well-established business practices such as Balanced Scorecard and Strategy Maps as well as requirements and conceptual modeling techniques such as goal modeling. The connection from BIM to databases is supported by a complementary research effort on conceptual data integration.

Glaser, et.al., (2008).,Business intelligence--technology to manage and leverage an organization's data--can enhance healthcare organizations' financial and operational performance and quality of patient care. Effective BI management requires five preliminary steps: Establish business needs and value. Obtain buy-in from managers. Create an end-to-end vision. Establish Business Intelligence governance, Implement specific roles for managing data quality.

Advantages

1. Fast and accurate reporting in time
2. Valuable in business insights
3. Manipulate large amount of data
4. Better data quality
5. BI help companies to understand customer behaviours
6. BI helps in identifying new opportunities and building out new strategy
7. BI unify multiple data source
8. Improved, accurate decisions
9. Data from BI tools can help business
10. BI can analyze inefficiencies

Conclusion

With 18 percent of the Indian market, Microsoft and Oracle are also the leading suppliers of BI applications. Business intelligence (BI) is a broad category of data collection, storage, analysis, and access applications and technologies that help business users make better business decisions. The knowledge is extracted by business intelligence tools, converted into simple insights to enable actionable and strategic decision-making to accomplish their objectives easily. Business Intelligence systems deliver historical, current and predictive views of business processes, most often using data that have been collected from operational data in a data warehouse or a data mart.

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EVOLUTION OF ARTIFICIAL INTELLIGENCE IN FIELD OF HEALTH CARE

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Introduction

Jiang, F., et.al., (2017)Artificial intelligence or AI are intelligent machines which are designed to mimic human Activities and can also, behave like human's, Artificial intelligence makes decisions on their own to solve a problem, simply Artificial intelligence are simulation of human activities, they use sophisticated algorithms to learn through large data available, Artificial Intelligence is developed to reduce workload of human and used in places were human could not do the work.

Lu., H, et.al., (2018) The Artificial intelligence we use now are called weak Ai, they are developed in such a way that; they could only outperform humans in Specific tasks, so there is no conflict that Artificial intelligence overpower Humans in the world.

Mail My Statements. (2018) Now coming to health care industries, we face many challenges such as, continuous increase in cost of drugs, Substandard treatments, More cases of failure in treatments…etc.

Lu.,S,.et.al., (2017) Artificial intelligence is more accurate in work and fast in resolving problems and provide sharpen solutions, in health care industries Artificial intelligence improves clinical abilities and by using its data it could predict diseases and provide advance treatments, as they are good at analyzing data they could specify the regions where a patient need improvement and suggest required diagnosis and treatments.

Implementation of Artificial Intelligence in health care industries will bring a big change and development in health care sector helps in providing quality treatments and increases the success rate in treatments...etc., As Artificial intelligence has the efficient of data analysis it could analyze various clinical data and provide a better result, note that artificial intelligence will/could not replace a human doctor, rather it assists them for decision, Artificial intelligence has a versatile scope in many sectors like, Genetic programming, Data mining, pattern recognition…etc.

Detection and Treatment using AI

Detection: Shah, R., & Chircu, A. (2018). Artificial intelligence uses its unique technology called "NEURAL NETWORK" which analyze extensive clinical data/information on both historical and specific patient data and by comparing them, it provides clear diagnosis report.

Shah, R., & Chircu, A. (2018). Even though Health care industries have developed a lot in these days, physicians are still struggling a lot to provide correct diagnosis, in this part Artificial Intelligence plays a role of providing best diagnosis and treatment, Artificial Intelligence cannot be a replacement to a well-trained physicians (Doctors), but it can provide additional help to doctors by providing them clearer images of suspicious regions, better tools for analysis and helps in maintaining individual reports for each patient, the important aspect of every hospital is "PATIENT CARE", moving further the evolution of "SMART HOSPITAL" as begun by implementation of these technologies, its success depends on the willingness of doctors and patient to accept this new technology, developers must keep in mind the usability and easy adaptation of these technologies.

Development of AI in Health care

SHARMA, Y., et.al., (2020) Artificial intelligence is good in areas where the need of medical understanding is lower as the complexity reduces, in

due course of time the Artificial Intelligence models have become more common in clinical and health care industries, Artificial intelligence are well-versed in handling complex variables than humans, so they are used in analyzing reports of ECG (Electro cardio gram)test as their Algorithm could analyze systematically minute heart beats changes which could be an early sign of major cardiac diseases, steadily Artificial intelligence can now respond to the needs of time-critical patient with rapid-diagnosis technology, we face a "TRUST PROBLEM" on Artificial intelligence, it is not so different from the trust problems we face from other technologies, it just reduces as users to patient, In order to prove its efficient Artificial Intelligence needs to demonstrate its accuracy is better than a physician.

Augmented Intelligence

Combination of human intelligence: Hague, D. C. (2019). An approach towards Augmented intelligence which is an extend of Artificial intelligence creates a great impact on the potential of technologies and this concept would help more in development of health care industries.

Hague, D. C. (2019).Over the last few years, the interest in AI had developed and we could see headlines about robot-assisted surgery, drug discovery powered by AI…etc. An AI model undergoes many checks and risk evaluation for its implementation, now coming to the term "Augmented intelligence" which means human decision combined with machines outcome, simply it can be explained as a joint decision made by human and machine, which generally provide a better outcome, in health care industries we use this kind of approach, Physicians analyze results from these AI models tomake final decisions, for example in radiology Artificial intelligence look-out issues in an image and by analyzing its result/report radiologist make decision and treatments which allows them to move quick through routine images and let them to move for more difficult cases.

AI for health

"The enjoyment of the highest attainable standard of health is a basic human right"

-WHO CONSTITUTION (1946)

Pipeline Benchmark: Salathé, M. et.al., (2018) It is a way of training Artificial intelligence models, it is done by analyzing public and private data and applying it in AI models, then the model is trained in a platform and results are obtained and analyzed.

Salathé, M.et.al.,(2018)Health care sector is an important sector for society, Artificial intelligence models provides new ideas/concept to address "shortage of medical professionals" which became serious due to growth of population, health and care are provided by government but also with private investment, health care industries contribute 3.6% (GDP of health care in India (2019)) of GDP and also it is a fast-growing sector in all the countries. In recent years, all types of health information are being digitalized on the other hand health care data are very sensitive and subjected by privacy laws, which limits the information/data provide to Artificial intelligence, and hence it reduces performance of AI models.

AI and DATA

Data types: Khanna, D. (2018). Artificial intelligence depends on data, which is divided as structured data and un-structured data, to understand these structures, AI implements techniques like Machine learning, Neural network and Deep learning to structure and classify these data and determine the type of data to be processed for analyzing.

Khanna, D. (2018). In medical field human performance has been surpassed by Artificial intelligence, particularly in the field of diagnosis and treatment Artificial intelligence grows rapidly, it reduces complex-task and expenses which simplifies the Treatment for patient and doctor, AI uses sophisticated algorithms and self-correcting abilities to improve its accuracy, in medical images like CT scan, X-rays, MRI, Artificial Intelligence are excellent in analyzing them, which reduce the wait

time of patient for diagnosis report which speeds up the further treatment process.

Abilities of AI

Data integrity: Morley, J.,et.al.(2019) Artificial intelligence train itself using data (health report), hence any misguide information/data causes problems in algorithms of AI, globally it creates a large scale of problems.

Treatments methods: Morley, J.,et.al. (2019) Artificial intelligence has a great ability to diagnose disease, it uses various technologies for diagnose and treatment, for example, to diagnose "breast cancer and tumor" Artificial intelligence uses simple "decision tree structure" and to classify "diabetes mellitus" and "genes" AI uses a technology called "support vector machine" …etc.

Morley, J.,et.al. (2019)Around the globe, Health care industries are struggling with continuous increase in cost and worse outcomes, clinical entrepreneur, politicians and policy makers stress that the only way to resolve this is implementing AI in health sector, Artificial intelligence in health care sector is still in early stages, it doesn't have impact in frontline clinical care.

Advantages

- Implementation of AI will increase work flow in hospitals and helps to save time and cost.
- Artificial Intelligence can keep track of patient's health data and analyze them to provide advance treatments at early stage of disease.
- It provides tools for analyzing patient's data and provides clearer information on suspicious region.
- In Electro cardio gram (ECG) test Artificial Intelligence can identify even a minute changes and report suggestive measures for diagnosis.
- It helps doctors/physicians to examine right patient at right time with suitable diagnosis.
- In Scan reports like X-ray, CT – scan...etc., AI helps in saving time of doctors by providing them a clear report of damaged/infected region, which helps the doctors to move quick on further treatments.
- AI tracks the flow of disease using which we could stop spreading of a disease and find its origin to evict it.
- AI powered bots can work in the place where there is threat of spread of certain disease to other doctors, nurses and patients, this avoids the spread of disease to medical professionals.
- In providing immediate first – aid – treatment, AI powered virtual bots can assists time – critical patient with immediate diagnosis.
- Artificial Intelligence can speed up the process of drug development thereby reducing the costs and side effect of drugs.

Conclusion

In a country like India with a population of ~138 crores, It's a difficult process to provide better health care to all the people in-fact from recent analysis, India as one doctor for every 1,457 people which is in-sufficient to provide better health care to everyone, In this place implementation of Artificial intelligence can improve clinical ability even in a remote village and provides basic diagnosis to everyone, as technology develops everyone now has a smart-phone, so by using its application we could improve health care system in a wide range, such as direct video calls to medical professional and AI powered bots to help in rapid treatments even without reaching hospitals, It can save life's of many people in India and also it reduces the cost of Treatments which helps to achieve the goal " Free and quality Medical treatment for everyone".

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USER FRIENDLY AI TECHNOLOGY IN HOSPITALS

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Introduction

Coirera E.W. (1996) artificial intelligence is defined as the branch of engineering which deals with computer understanding and mimicking the human intelligence by analysing huge amount of data for finding the research and solving the problems logically .A.I was developed in late 1950's today A.I causes a lot of impact in all fields especially in the medicine field. In the medicine field it is analysing data and predicting the problem for the last decade there is huge iANN is the piece of a computing system designed interest and development in medicine, A.I fields in the medicine especially used to in the Artificial Neural Network (ANN)to simulate the human brain of analysis and process information .it is a famous analytical tool, it is foundation of artificial intelligence and solve problems that would be prove impossible or difficult by human or statistical standards made by the man consisting of man-made nervous system consisting of highly interconnected computer process capable of carrying out of calculations for data processing this network of artificial neurons consist of an input layer ,a hidden layer and output layer this network consist repetition other field using ANN include cardiology attacks and also used in the CT and MRI scans in the hospital oral epithelial cells, gastric thyroid, breast, pleural and peritoneal effusion cytology.

Mak, k.k., (2019) in the initial years there mainly thinking about the development of AI and it is good or bad and any other side effect and, they have no idea about AI and which can work like human brain or which is think like humans in the late 1950-1970 years. In this period their invented the first robotic arm this invention got success it done programmed work to it by step by step and done the diecasting Eliza in the year of 1964 based on the pattern matching and substitution developed which is used for next development in this field in year of 1966 shaky constructed the human robot which was the biggest mile stone in that decade

J Laugis, T Lehtla (2005)the study of the A.I in the medicine field is around the 34 years old .it is mainly concern of development of programs that perform diagnosis and make the recommendations of the medicine .brought of A.I in the medicine field causes a lot of drafting changes in the field this A.I stated in the top most medical collage like aims , MIT, Stanford their require highly expert in the field of the A.I ,huge collection of the members and lot of research are going on this field medicine and AI can communicate in the multiple ways the researchers in the field are working more about the coordination may technological in which medicine is may solve the complex problems and some developing some technology in the field of AI , new quicker methods are developed or updated in the days use it in their practice and submit their own experience back to the knowledge database to help improve it in collages Stanford university California created a computer system which uses of medicaland clinical researchers. Casnet model was developed in year of 1995 .it could help us to find the disease in each patient body. based on the collected patient information and database of 750 rules, it could provide or give the patient recommended pathogens and suitable antibiotic treatment adjusted the for each patient .in the year 1986 A diagnosis generating system was found named as explain by university of Massachusetts which is used to took the patient symptoms as the input. "AI" winters is called as the

period in year of the late1970the team is slightly reduce the interacting doctor and the patients and signify reduce interest and funding leading to lesser significant advancements both these dormant phases were due to the perceived applications of AI the first aim workshop held in the Rutgers university in 1975. carnet model is developed during these workshops it A technology called Deepqa was developed used to analysis data over instructed content to generate probable answers. DeepQa could be used to provide the evidence -based medicine response and aid in clinical decision making and used for distinguish bots, fuzzy logic is under goes reasoning field which is real world phenomena. instead of treating binaries yes-no, up-down etc... This system recognizes world problems may find the solutions since medicine is also a continuous domain and most medical data is also inherently. Deepa a was developed by the Watson which used natural language processing to analyse data over unstructured content generate probable answers deep learning should important in this field an open domain que - Ans system was created by Watson which was later used to identify the new RNA binding proteins in between then chat and pharma bots were developed in 2015 to educate who are suffering from paediatric diseases

Literary Survey

P Mamoshina, et...(2018) In recent years, there has been massive progress of artificial intelligence (AI) Through this survey I find that A.I have bought many changes in the field of the medicine and it is useful in many ways this A.I reduces the time to rectify the problem in the body and help to solve the problem A.I in medicine field as much advantages and as well as disadvantages. Health care industry as means of analysis. the diagnostic records the symptoms physical and medical conditions these AI also give the images of the MRI, x-rays, and CT scans of the patient and they are analysed by the medical professional and them identify the problem this paper discuss with us distinct types. these machines are used to hold the enormous amounts of information about medical and clinical research papers algorithms are used to gather the copious amounts of the healthcare data and analysis this data to provide the medical doctor to address the problems facing by the patient.

A Darko,et...(2020)Patient monitoring the adoption of electronic health record and proliferation of smartphone and fitness monitoring devices has created unprecedented application of AI techniques in health care machine learning personalised medicine patient record management and information retrieval patient montearing, and challenges in this field while rapid investment in AI and associated innovations have great promises to the health care industry AI has found drasting challanges in the health care industry problem facing in health care industry. As years are developing the new techniques are developed to identify disease in the patient and the suitable antibiotics and reminds are developed further years and said the is lot of usage of artificial intelligence in the medical field industry .as there is Tremounds changes starts in the year of 1970 it is reduce the time for identify and diagnosis of disease and reduce the burden of the doctors it makes simply.

BT GREER, JKHAN (2004)One of the important AI it can used in the drug development sector it vast studied in this sector experts believe that using of AI in drug sector increase the efficiency of workflow and do research without error and find the new drugs with a smaller number of trail errors. No drug is created by the AI it is used for trails only for furthers years a drug is created by AI there are two major draw backs in AI in the medical field .one is rapidly increase in the generation of medical data professor are lagging in the analysis of that data another drawback is the current working of the healthcare in serious diagnostic errors and some medical errors are going one now a days ,and also due limited input of algorithms in AI and insufficient studies and evidence are resulting the harm to the patients a single mistake done by the doctor it can the life of the patient so more research and studies are required before the enneads an algorithm in the market

Koh, H. C.,et..(2011) They are many more challenges are present AI in the health care industry is making the human lazy and they use the working use of their brain they are simple depend on the machine through the are capable of analysis the information they are simple depend on the machine data mining is process that can identify or analysis of database previous undented pattern and trends datamining is the AI technology that can process the vast information required for the user Although AI promise the aid in the bettering medical field by workflow and reduction. If an algorithm-based on the limited input data another issue is the ethical course of action in a situation an algorithm is wrong that should be addressed even an algorithm that can be researched extensively and validated before being implemented the algorithm to the AI. Doctors are indispensable faces when they found new recorded diseases. Doctors and nurse are adopting the new techniques and learning to accurate the services to patient for the better treatment

Advantages

1. Ability to identify early detection of high risky diseases in less time.
2. Possibility to save the on the medical cost.
3. Take the lesser time to treat the patient.
4. Suggest the suitable drug for the problem.
5. Optimise the use of hospital capacity to meet growing demand.
6. Gain more autonomy over care with the help of digital process.
7. Mental alertness and decision-making capabilities.
8. There will be less mental stress for doctors while doing the surgeries.
9. Decrease the Human errors while doing the surgeries
10. Virtual Presence

Conclusion

This technology is very useful in India because in our country large population doctor takes lot time without AI while using the AI the doctor can treat patient faster. Because of it is the low cost for identifying the diseases. This is a amazing technology it is useful in the future the AI can rule the world in the future years.

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