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Importance of Information and Communication Technology (ICT) in Healthcare Department - A literature Review

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Abstract

In the era of digital revolution, where we're making our lives easier, we also have the advancement and innovations of technology. These technologies are almost successful in overcoming geographical distance, better quality service at low cost. When we think about Healthcare Sector, accessibility is the major term in rural and some urban areas also. So the ICT plays a critical role in improving healthcare for individuals and communities. The doctors, patients, hospitals, and laboratories connect with the help of ICT. It also improves the Healthcare Research Analysis. With the use of Artificial Intelligence, it can reduce medical errors. ICT also plays a critical role in Healthcare Education, not only for the students but also the doctors, nurses and other healthcare professionals can take its maximum utilization.

Telemedicine plays a vital role in this covid-19 pandemic. It gives the benefit of accessing medical patients in remote locations quickly and more conveniently. It gives accessibility and availability to the public from the comfort of being at home. In telemedicine, we can use the video conferencing service by which the patient can talk to a doctor who may be thousand miles away from him. So, this is the healthcare innovation which improves Remote Patients Monitoring

Keywords: Information Communication technology; Telemedicine; Covid-19; Remote Monitoring

Introduction

After the 21st century rolled around, and India's Millenium goals were announced to the world. Three of the major goals revolved around healthcare. 15 years since then India has achieved success and some while and other goals. There is still much to be done with hospitals training at the same time to meet the needs of India's billion-strong population which has information and communication technology list of medical personnel. This answer involves everything from satellites in orbit to the humble mobile phone.

Healthcare in 21st century India is paradoxical. On one hand India is a hub for medical tourism. It's the best hospitals and medical practitioners highly sought not just by Indians but the world. On the other hand, primary and basic health care is still a pipe dream for many who live in poverty or in remote areas away from big cities. Equally high standards of healthcare for all are still a challenge. One that has made a cube by two factors: a massive call for medical services and absolute numbers of those in means to a shortfall of resources. Both in numbers of qualified doctors as well as convenient modern hospitals and medical infrastructure [1].

In the 2000s just as India's Millennium development goals were announced Indian Health Care ventured into the Brave New World of ICT to telemedicine. Using telemedicine patients could access Quality Healthcare no matter how far away they were located from doctors. One of the earliest ways to bridge this distance was satellite communication, enabled by the Indian space research organization or ISRO. Inside satellites were charged with connecting District hospital with centers of excellence and Specialty Hospital in big cities. Now no matter how remote the location, satellite links provided connectivity while special computer software and hardware were installed at the patient and special end [2,3].

While the satellite model of telemedicine created many new virtual OPDs. It didn't become as prolific as expected over the next

decade and a half. One of the biggest impediments to it becoming a full success has been the cost. Telemedicine relied on satellites in India, and we relied on ISRO Satellites. We require very expensive tech technology, equipment to interface with those satellites and we require end-to-end connection using the same equipment.

Paradoxically as the cost of setting up satellite-based telemedicine units shut up. Cost of other internet-based communication applications plummeted. These are applications that many of us use to chat with our friends and family. All new given time of the day, the trauma center at Delhi's all India Institute of Medical Sciences is passing. This is where some of the most serious emergency cases are admitted. It is also the first of its kind telemedicine that is being practiced. Using a simple laptop and free software like Skype that allows video calls without even being present in the ward around.

Thanks to free calling applications the best doctors are available nearly 24*7 at extremely low cost to the hospital. Low Cost of free communication software and even emails have created a virtual OPD where an increasing number of patients are tapping into India's best Healthcare from any part of the country. With a hospital like AIIMS, receiving an average of 3 million patients annually, ICT has a big role to play in efficient patient care. Which is why AIIMS has become the first government Hospital in India to go completely digital with online registration and generation of Universal Health identification number or UHID.

Electronic medical records EMR are which can be accessed securely and confidentially by On-call doctors, specialists, nurses and labs. An integrated Hospital information system that carries real-time updates about each patient and Hospital resources. India's first packs of picture archiving and communication systems that allows digital sharing of medical and radio images like MRIs, X-rays, CT scan etc. India's first group of nursing informatics specialists and a constantly refreshed public display system to ease the minds of patients and their companions. Behind the scenes, NIC (National informatics Center) has been hard at work developing an easy-to-use system that anyone can use.

NIC has a product called E-hospital. It's operational and has approximately 50 hospitals. It means both the server and databases out within the hospital. People can access its services from the hospital counter. It means as a common man I must go to the hospital to access it. Just like AIIMS, JSS knew that digitizing medical records and key hospital processes could go a long way in creating effective patient care. So, with the help of ICT experts, they devised a module or package called Bahmni. Basically, it is a n integrated hospital system and an EMR (Electronic Medical Records) and a combination of multiple open-source products which we have integrated among themselves, and we have enhanced the usability of some of these products to fit into a resource-constrained environment people with her which who have low literacy and who're able to use these things very easily (Table 1). Each of these open-source applications is adapted to the rural setting. Bahmini doesn't rely on internet networks that fail to reach remote areas. It also uses very simple accessible technologies.

Table 1.

BAHMNI	A bunch of 3 Different Open Source Applications.
Open MRS	Store Medical Records Electronically
Open Elis	Manage Lab Processes and Validate & Store Lab Reports
Odoo	Manage Accounts Inventory & Administrative Operations

Telemedicine

Telemedicine in India has come a long way in the last two decades from high-cost satellite-based technologies to freely available social networking applications. The next stage of ICT innovation is web-based healthcare applications that aren't solely about video calls and messaging but offer a full bouquet of services exclusively for the medical world. In short this is the era of health informatics and that's where eath and gve comes in, developed by Mohali's Center for Development of Advanced Computing (C-DAC).

E-sanjeevani can be accessed on the internet as easily as any other social media site. Patients can book online appointments and have tele-consultations with doctors. Doctors and laboratories can generate and share electronic medical reports or EMRs. They can also pick up readings and images directly from machines like MRI, Microscopes, Film scanners etc. The biggest advantage of E-sanjeevani is that it allows even remote patients to connect with specialists. E- sanjeevani is a completely indigenous service which understands the specific needs of Indian healthcare. It is very easy to use and has a simple GUI (Graphical User Interface) that even those who aren't computer savvy can operate. This makes it ideal for use even across rural India and those centers where computer literacy is still developing. But in the day and age where every patient may not have computers, they still possess mobile phones and so there is a new focus on healthcare through mobile data and this time it's not just about cure but also prevention. So, due to these circumstances, there is a mobile app M-swasthya, which is dedicated to health and wellness. It helps in the monitoring of wellness and keeps personal records for diabetes parameters blood sugar weight and body mass index. It plays the communication role between the doctors and patients and connects with the nearest hospitals and emergency services. It also helps you keep abreast of the latest in fitness trends and healthcare news. It is literally wellness in the palm of a person's hand.

In the current technology, we have ubiquitous computing or variable sensors that work with wireless medical devices which could be used by individuals to manage and maintain their own personal health. With ICT, we could be able to bridge the gap between patient and doctor. The idea of virtual clinics is catching

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on, but no clinic or hospital is complete without diagnostic tools. Technologists are hard at work to devise low-cost portable and easy to use devices for diagnosing and monitoring health parameters. For example: - a simple mouse becomes a wireless stethoscope that measures pulse and lung activity and converts it into digital formats that can be shared online. With such easy to use and inexpensive technologies one can think of a future when no one will be denied quality healthcare.

One of the biggest millennium development goals for the people is quality healthcare. The people who belong to the socially and economically weaker, are affected by it. But one of the biggest challenges is the shortage of qualified doctors, specialists, and medical staff but we thank the tools of information and communication technology for this slow and outstanding change. At AIIMS Delhi, a teaching session is progressed by the specialist team of AIIMS using basic filming and broadcasting equipment. The session is conducted with the doctors and students in different medical colleges and hospitals [4-6].

There are a lot of projects which people have now come up with because the bandwidth is available. One of them is Telemedicine and it is implemented in about 160 + medical colleges and 200 hospitals which are already onboard. These projects can now kick off very fast because the connectivity component is taken care of so what they need to do is only bring in their specialization and start using it. National Knowledge Network, an ultra-high bandwidth fiber-optic network that stretches out across India and abroad. NKN provides incredible speeds and data carrying capacity of over 1 GB / Sec, making the sharing of heavy data faster and more efficient. These all facilities bring many new avenues for medical innovation, collaboration and education have opened in healthcare.

Conclusion

Today ICT is at the forefront of reducing barriers in healthcare from conquering distances to innovating machines and building knowledge resources as the virtual hospital evolves and spreads its networks.

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