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A Study on Role of Information Technology in Healthcare Industry

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Abstract: ***Introduction: Currently, information technology is considered an important tool to improve healthcare services. To adopt the right technologies, policy makers should have adequate information about present and future advances. This study aimed to review and compare studies with a focus on the future of health information technology Methods: This review study was completed in 2015. The databases used were Scopus, Web of Science, ProQuest, Ovid Medline, and PubMed. Keyword searches were used to identify papers and materials published between 2000 and 2015. Initially, 407 papers were obtained, and they were reduced to 11 papers at the final stage. The selected papers were described and compared in terms of the country of origin, objective, methodology, and time horizon. Results: The papers were divided into two groups: those forecasting the future of health information technology (seven papers) and that providing health information technology foresight (four papers). The results showed that papers related to forecasting the future of health information technology were mostly a literature review, and the time horizon was up to 10 years in most of these studies. In the health information technology foresight group, most of the studies used a combination of techniques, such as scenario building and Delphi methods, and had long-term objectives.***

Keywords: Information Technology, Healthcare Industry

1.Introduction

Healthcare comprises directing and controlling a group of one or more people or entities for the purpose of coordinating and harmonizing that group towards accomplishing a goal. Healthcare often encompasses the deployment and manipulation of human resources, financial resources, technological resources, and natural resources. Indian healthcare Industry is growing at 12% annually, according to a recent report by Springboard Research. The Indian healthcare sector has started to serve customers or patients better to balance the profitable business operation and meeting social objectives. The main area of focus is to improve the service to the end customer patients. It is observed that if substantial improvement is to be achieved over the coming decade, then automation of clinical, financial, and administrative transactions is essential to improve the quality, preventing errors, enhancing consumer confidence and improving efficiency in the health care system.

Healthcare information technology is all about communication-communication between devices, between team members, between patients and their medical providers, between separate medical facilities. These communication channels are enabled by carefully-selected and installed hardware solutions, and maintained with prompt and effective repair services. These components should be scalable and flexible so that your network can grow along with your facility.

Information technology's role in communications also puts it on the frontlines of your facility's security team. Healthcare IT standards, patient privacy rights and patient well-being all require a trustworthy, secure network that is transparent and easy for your staff to use but opaque and secure against unauthorized users. A healthcare IT services provider can help your facility initiate best practices for network security. Today's patients expect their data to be secure, and we can help establish your reputation as a trustworthy steward of patient data.

Scope

Information technology has the potential to substantially improve healthcare by bringing decision support to the point of care, by providing vital links and by allowing routine quality measurement to become reality. Healthcare IT market is fastest growing where the hospitals across the country are leveraging the power of IT to provide the best of healthcare services. Health IT may be especially beneficial for inner-city and rural populations and other medically underserved areas. It is necessary that latest IT technologies in healthcare centre that are available in urban population to be made available to rural areas of India. Rural users can access information by connecting block headquarters to fiber optic network, using wireless technology to achieve last mile connectivity. Achieving this potential will be challenging task, but it is possible.

2.Review of Literature

Mobile Technology Applications in the Healthcare

The development of mobile technologies steered both the manufacturers to compete with the existing firms, and the solution developers to produce new and talented applications using mobile technologies (Price & Summers, 2006). In the healthcare environment using mobile technology and mobile devices has proven to be effective. While developing such applications, patient requirements and the level patient accept the impact of technology on their health care and disease management should be considered (Siau & Shen, 2000). It is a must to make it balanced between the cost of deployment and the use of device and satisfying patients' requirements. Some of the

outstanding mobile applications in healthcare environment, their advantages and disadvantages from different points of view are presented below. ITAREPS (Information Technology Aided Relapse Prevention Programme in Schizophrenia) is a program which aids relapse in the prevention of schizophrenia using information technology. It provides a mobile phone-based telemedicine solution for this purpose. With the help of the home tele-monitoring system via a PC to mobile phone SMS (Short Message Service) platform which recognizes prodromal symptoms of relapse, the system warns to take the action before hospitalization which is both costly and stressful both for the patient and the family of the patient. This program offers an authorized web-based interface both for the physician and for the patient to analyze the dynamics and development of possible prodromes. The early warning signs data is collected through a SMS platform using a mobile phone, from the patient himself/herself and from his/her family members As a second application, in the management of asthma (Ryan, Cobern, Wheeler, Price, & Tarassenko, 2005) peak flow monitoring is widely recommended and used. This study includes an observational study using handheld electronic peak flow meter monitoring and mobile phone technology in a time period of nine months. Patients who are at the ages of between 12 and 55 requiring treatment with regular inhaled steroids and bronchodilators were recruited from nine general practices. In this study, from all of the participants 69% of them who has filled in the post-study questionnaire form were marked as 'satisfied' or 'very satisfied' by the study, citing the ease of use and the increased autonomy and understanding of the asthma as the main advantages. Totally, 74% of them have indicated that the system had helped to improve their ability to manage their symptoms. The most attractive features of the telemedicine system were increased awareness and information about asthma, improved ability to monitor and manage the condition with the feedback screens on the mobile phone and ease of use. As a result it is possible to say that a server based peak flow asthma telemedicine system that analyses peak flow values in real time and feeds information back to the patient within seconds would be a valuable tool to enhance self management. The usage of mobile phone technology for recording and gathering asthma data (Cleland, Caldow, & Ryan, 2007) is another valuable study in this field. In this study a qualitative interview study using a purposeful sample of 10 patients with asthma and two research staff were conducted. The patients' diary information was collected twice a day using an electronic peak flow meter linked to a mobile phone with an interactive screen to record current asthma symptoms and this information is stored in a server. Both the patients and the staff believed that mobile phone technology would be useful in clinical practice as well as research.

3.The Industry

With growing demand in Healthcare service in India, it is imperative that a huge number of healthcare software companies will thrive in the country. With the wealth of a huge population, these healthcare software companies will definitely try to impact the overall healthcare. As the government healthcare service in India is in a dismal condition, there is a growing demand of these healthcare companies. These healthcare consulting companies' help patients connect with the medical services available in the country. Below are some best Healthcare Software Companies in India.

1.Lybrate

Lybrate is the perfect solutions for them who would like to avoid the hassle of going to a hospital and booking an appointment. It directly connects you with the doctors in your locality. With such exceptional vision, Lybrate was created as a Delhi-based start-up by Saurabh Arora and Rahul Narang in the year 2013. Lybrate claims to have more than 150, 000 doctors at the service of patients who could not connect with them otherwise. It also maintains patient anonymity.

2.Livehealth

Livehealth is a Pune-based data management platform that collects patient's data for future analytics through AI based technology. They also arrange online check-up of patients by renowned and experienced doctors. Their primary specialties include allergy, psychology and psychiatry. The website charge around $49 per visit. In the coming years, Livehealth will emerge as another giant in healthcare in India.

3.Clinicea

Clinicea is an EMR expert that provides a plethora of healthcare services worldwide. With its Indian office in Kolkata, Clinicea provides an electronic medical record, lab reporting, preventive health reminders, clinical audit, appointment scheduling services, pharmacy data, imaging, patient portal, customer support in more than 20 languages etc. Their specialties include all the major domains of the medical arena. Their 24*7 service makes it very helpful for patients in India and worldwide.

4.Patientclick

Patientclick provides direct patient care through telecommunication. Their service is both patient and physician friendly where a patient portal is maintained to provide patient education and instructions as directed by the physicians. They maintain the electronic health record and provide e-prescriptions facility that removes any error found in handwritten prescriptions. Reports of lab tests can be uploaded in different modes so that the physicians can access them. Their specialties include Internal medicine, Gynaecology, Nephrology, Neurology, Orthopaedics, Psychiatry, Urology etc. They provide telemedicine facility for rural patients. They also have go-live assistance facilities.

5.Healthcare Technology Trends in Future

From real-time diagnoses aided by machine learning to wearable devices that track and transmit patient data from

a distance, a host of new and evolving technologies are poised to influence care delivery in 2020**.** Intended to maintain good health, not to react to an existing illness, these investments are designed to reduce hospitalizations and related costs. "We're seeing a shift away from using technology to advance specialty care and high-tech medicine and a shift toward using technology to enable prevention and primary care," Dr. Felix Matthews, a managing director and physician leader at Deloitte, tells *HealthTech*. The continuing challenge for hospitals, he adds, is finding the right tools and level of investment to tackle risks and reach enough patients to justify the effort. Matthews spoke about five healthcare trends and their potential implications in 2020.

1. Wearables Will Bring Deep Data Insights and Challenges

Once the domains of early adopters, wearable are poised to help healthcare professionals collect a wealth of data from a widening and more diverse pool of users. This will come in the form of remote patient monitoring, in which specialized devices track metrics such as blood pressure and glucose levels, and also via fitness trackers and devices such as the Apple Watch that can identify signs of atrial fibrillation, among other things. As a research tool**,** the technology is gaining ground. In September, Apple announced three cutting-edge studies-on women's health, heart health and noise exposure-in conjunction with leading medical institutions. More than 400, 000 Apple Watch users have agreed to participate. Still, the movement presents big interoperability and interpretation challenges for providers. "As a clinician, I don't have time to deal with a flood of data-where's my team filtering through this and escalating the important stuff to me?" Matthews says. "And do I expose myself to more medical liability because I'm receiving information about my patient's condition but not acting upon it, because I'm busy doing whatever I have to do as opposed to monitoring data feeds?".

2. Artificial Intelligence Will Enhance Diagnosis, Process and Security

Increasingly, AI is becoming a pivotal part of healthcare. As healthcare threats increase in number and severity, AI can be employed to recognize unusual behaviors on a network, watch for fraud threats and predict malware infections based on previously identified characteristics, among other security measures. The technology is also helping patients take better control of their own care**,** with tools that include chatbots for quick help with minor ailments, and wearable devices such as smart shirts that can record health data and produce predictive capacities. It also can be used to develop algorithms that help oncologists offer deep insights on biopsy reads. Many of these applications remain segmented, however, which presents a barrier to fully comprehensive care. "Right now, artificial intelligence is mostly individual companies with one variable and one AI algorithm solving one problem," Matthews says.

Which is why he expects to see alliances develop between tech companies and healthcare organizations, as well as tools that perform double duty: "What I believe we will see in the next year or two is algorithms that interpret multiple data sources at the same time from different variables. Once you've got that, the sky is the limit."

3. Telehealth Will Widen Its Reach and Scope of Service

More doctors, health systems and medical specialties are providing telehealth services. As insurers move to offer reimbursements for telehealth and the scope of telehealth coverage for Medicare Advantage enrollees expands the benefits will continue to be more evident. A senior citizen recovering in post-acute care, for example, could receive an on-camera consultation without the physical and financial toll of travel. Regardless of a user's age or condition, familiarity with the concept will prompt wider adoption. "I think FaceTime and Google Chat have really opened people's willingness to do remote things; you're comfortable talking with your grandmother over Skype, so you also understand this is a normal type of communication you can have with the clinician," Matthews says, noting that not all Americans have high-speed internet coverage or personal technology to support it. Such exchanges will increasingly go beyond a patient's typical providers to encompass a wide range of care needs, he adds. That's crucial for people in rural or underserved areas who require the care of a specialist: "You are calling for higher acuity cases or situations, and you are willing to entrust somebody who is far away.

4. Virtual Reality Will Play a Greater Role in Patient Care

The technology that some may assume to be purely for gamers are finding a role in healthcare. Senior living residences are implementing VR to help memory care patients "visit" favorite vacation spots, access street views of their childhood homes and enjoy comforting scenes of animals and nature. Those experiences can spark group discussions and boost socialization. Vivid imagery provided via headsets is also being used in hospitals as a mode of distraction-and, when necessary, a way to avoid or lessen the use of pain medication-for patients undergoing treatments or who are experiencing discomfort. VR can also be used to educate; for instance, by offering "fly-through tours" of a tumor to explain treatment to a patient. VR also helps surgeons visualize potential obstacles before complex surgeries-a use that Matthews considers pivotal to advancing care. "I think there's a lot of promise for clinicians using virtual reality to improve procedural intervention or procedure by overlaying imaging data and relevant information," he says. VR can also provide audiences with a new perspective on illness. VR headsets with special software, for example, can help wearers experience what life is like for people with Alzheimer's. In this case, the tool both educates and builds empathy.

4.Research Methodology

Method of Study

A research method is a systematic plan for conducting research. Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. In a research paper, the methodology section allows the reader to critically evaluate a study's overall validity and reliability. The methodology section answers two main questions: How was the data collected or generated? How was it analyzed?

The method of study used in this research is as following;

1. Quantitative research

Quantitative research collects information from existing and potential customers using sampling methods and sending out online surveys, online polls, questionnaires, etc., the results of which can be depicted in the form of numerical. After careful understanding of these numbers to predict the future of a product or service and make changes accordingly.

2. Descriptive research

This process takes up the bulk of online surveying and is considered conclusive in nature due to its quantitative nature. The main idea behind using this type of research is to better define an opinion, attitude, or behaviour held by a group of people on a given subject. This allows you to measure the significance of your results on the overall population you are studying, as well as the changes of your respondent's opinions, attitudes, and behaviours over time.

A Primary Data

Primary data has been directly collected from online Google survey. The main source of collecting data in this section was by conducting a Google survey in a questionnaire form. The survey consist of close ended, MCQ type questions in it for the purpose of data collection

A. **Secondary Data**

Secondary data has been collected from following Websites, Internet, and Books.

Population The target population for this study is as follows;

Students, Entrepreneur, Working professionals.

Sample size: The sample size in this study is 20 respondents

Sample area: The location used in this study to collect data from people is as follows: Thane, Mumbai. Navi Mumbai.

There are two types of method used for data collection.

The first method is primary data. Primary data is conducted through survey in the form of questionnaire. The survey consisted of various types of questions like open ended question, close ended questions, MCQ type question. The secondary data is the second method used for data collection. In this method data is collected through various articles on internet and websites. The tools used for data collection techniques are Questionnaire Google forms observation.

5.Findings

- In this survey 70% of the respondents are females and 30% of the respondents are Male.
- In this survey, 65% respondents are in the age group 18-25 followed by 15% respondents are under age group 25-35.10% of the respondents are under age group 35-45 age group and rest 10% are in the 45+ age group
- The survey shows that 45% of the respondents are students followed by working professional, Entrepreneur and rest respondents come under other option.
- Major finding from this survey is that almost all of the (85%) respondents think that there is growth of technology in healthcare industry.
- The latest technologies people are aware of are Artificial Intelligence followed by data science, virtual reality, cloud computing, predictive analysis, Telehealth and Internet of medical things.
- Fitness trackers is most used product by respondents followed by other.
- Google Fit is the most used Smartphone application followed by healthify me, heart rate monitor and instant heart rate.
- Findings from this survey are that almost all of them think that Healthcare systems help to store patient's data efficiently.
- More than half of the respondents think that Healthcare information technology will help to improve the quality of healthcare industry.

6.Conclusion

With the help of IT, it is possible to transform health care and improve patient safety by better leveraging information technology to improve the efficiency, accuracy, and effectiveness of health care system.

Implementing and supporting IT applications require skills; hence physicians must make significant changes to both office and physician workflow and take time away to learn how to use IT.

Health care administrators and planners should take a long-term view because the benefits will not be immediately tangible. In India today healthcare is inefficient, error-prone, and of variable quality.

Hospitals are slowly moving towards clinical information systems, which helps them to lower their cost, to raise the

quality and to improve their cash flow.

The degree of use of IT in healthcare varies by health care setting. IT and the internet had a significant impact on consumers. Numerous websites have made health information available to patients, thereby strengthening their role in care decisions. Now a day's some technologies are emerging in healthcare such as Clinical Data Warehouse, Clinical Decision Support Systems (CDS), Data-mining Techniques, Online Analytical Processing (OLAP) and Online Transactional Processing (OLTP).

These technologies are used to maintain and utilize patient data intelligently, based on the user's requirements. Information systems are used to educate patients about the latest developments in medical science through the internet and specially configured kiosks in hospitals and clinics.

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