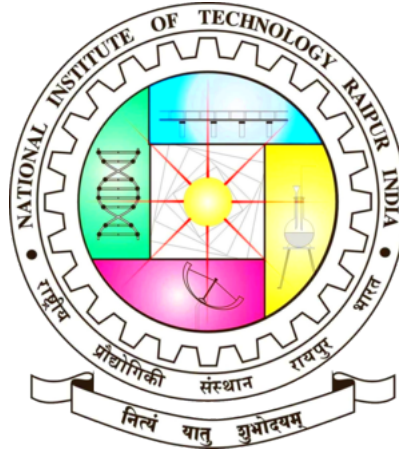


NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR



DISRUPTIVE INNOVATIONS IN HEALTHCARE

ASSIGNMENT 4 Basic Biomedical Engineering

Aditya Shrotriya
Roll number- 21111005
February 18, 2022

Under the supervision of:
Dr. Saurabh Gupta

Contents

1	Introduction	2
2	IoT	2
3	Electronic Health Records	2
4	3D Printing	3
5	Retail Clinics	3
6	Augmented Reality	4
7	Blockchain	4
8	Conclusion	5

1 Introduction

Innovation is no stranger to the healthcare sector. New therapies, medical devices, and healthcare management practices are adopted all the time. However, up until fairly recently, examples of disruptive innovations in healthcare were far less common. Disruptive innovation are those that cause radical change and often result in leaders in the field. They overturn the usual way of doing things such an extent that they have a ripple effect throughout the industry. The following examples of disruptive innovations in healthcare are centred on technology, customer-centric care, and third party advancement.

2 IoT

The IoT is changing everything from patients records and monitoring to inventory control to preventative care. Communication and collaboration between healthcare professional can now happen in real time- extremely beneficial aspect of the healthcare industry. The IoT maybe the most prominent technology making wave in healthcare. Many of the technologies disrupting the sector are only made possible through the interconnectivity of devices, application, the internet, and the cloud.

3 Electronic Health Records

Electronic health records have gotten has facelift over the years. With the IoT, big data and device connectivity provide up-to-date information about a patient at their point of care.

EHRs are easily communication between providers, as they are shareable through devices and secure networks. The convenience of EHRs is appreciated by healthcare professionals who can update and expand upon a patient's medical history. EHRs can also further preventative care efforts and reduce medical errors by providing an easily readable, comprehensive look into a patient's history. A provider can look back on a patient's medical history and find patterns that could suggest a medical condition that may have been overlooked and start preventative action immediately. The further development of EHRs will only see them become more and more appreciated over the outdated and time-consuming physical recording method.

4 3D Printing

3D printing is helping healthcare professionals and patients alike. Precise and custom designs can be made for patients who are not all the same regarding mass-produced prosthetics. Tissue Engineering is another breakthrough that surgeons are beginning to use. Using stem cells as a production material to create organs and significantly impacting the organ transplant process.



Figure 1: 3D Printing in Healthcare

Burn victims can find relief with 3D printed skin, as skin grafts can be painful and unsightly. With 3D printing, professionals are using human plasma and skin biopsies from the patient as the production materials to create new human skin-giving burn victims a better quality of life.

5 Retail Clinics

Retail health clinics, or a nurse-in-a-box, are essentially walk-in clinics found in retail stores, supermarkets, and pharmacies-such as CVS store. Retail Clinics are disrupting healthcare by providing convenient, quality care to patients for minor illness such as allergies, cold and flu, and minor burns and sprains. An essential part that makes retail clinic possible is EHRs. Additionally, retail clinics care can reach more people, and this broad accessibility, convenience, and decrease in costs aim to solve three major concerns of the healthcare industry today.

6 Augmented Reality

Augmented reality is yet another emerging technology disrupting the health-care industry-augmented reality supplements reality with images and sounds to creates its own type of extended reality. Gaming, retail, and education are taking advantage of this new technology, and healthcare is capitalizing on augmented reality for its educational benefits.

Additionally, augmented reality can be used to show a patient exactly how to apply medication, wash and dress a wound, and other duties that can easily be done by a patients rather than a doctor to prevent further aggravation of the injury. Augmented reality will provide better education leading to preventative health and reduction in medical error.

7 Blockchain

One primary concern with the exchange of sensitive and propriety data is secure. Whether it pertains to patients or professionals, healthcare data could prove to be catastrophic if it falls into the wrong hands.

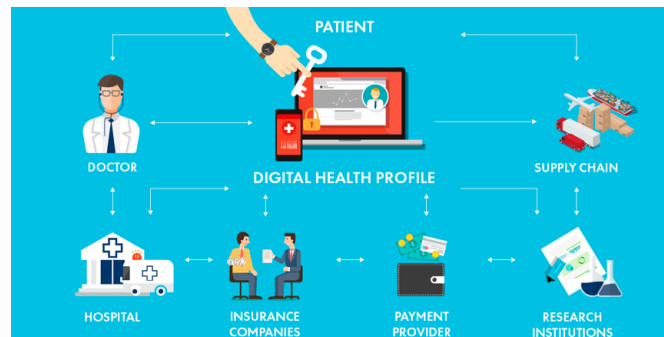


Figure 2: Blockchain in Healthcare

Using blockchain, smart contracts can be created on private ledger. Only a patient or healthcare professional qualified to see such data can cryptographically sign to access the data they need. For instance, patient records such as EHRs are celebrated for the convenience of back and forth, updated and expanding upon by professional. However, if intercepted, this data can illuminate sensitive data and financial information which can be used against a patient or hospital. Blockchain and smart contracts can be a critical step

in securing this data, being accessible only when verified by the qualified people who needs to access it.

8 Conclusion

Since these technologies are only recently being taken advantage of, healthcare has a long way to understand how they will integrate into operations fully. As healthcare grows, so will these technologies- disrupting healthcare in a ways we may not even comprehend yet. As healthcare becomes more intertwined with technology, the industry grow more optimised to provide quality healthcare that is easily accessible to all patients who require attention.