NATIONAL INSTITUTE OF TECHNOLOGY
RAIPUR

BIOMEDICAL ENGINEERING

ASSIGNMENT

Emerging Technologies in Healthcare

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Introduction

The term Emerging Technology commonly refers to technologies that are currently developing, or that are expected to be available within the next five to ten years, and is usually reserved for technologies that are creating, or are expected to create, significant social or economic effects.Emerging technology in healthcare is growing fast with innovations such as cloud computing, augmented reality, Internet of Things (IoT) connectivity, blockchain, and even drones to deliver prescriptions in a contactless manner.

1 Internet of Things (IoT)

Internet of Things refers to the rapidly growing network of connected objects that are able to collect and exchange data in real time using embedded sensors. They are revolutionising healthcare in several ways they have enabled remote monitoring in healthcare.Remote monitoring of patient's health helps in reducing the length of hospital stay and prevents re-admissions. IoT also has a major impact on reducing healthcare costs significantly and improving treatment outcomes.

- **Benefits-**
  - **Patients**-Sensors,wearable bands and other wireless devices can help to monitor vital health parameters and can be used to remind them.
  - **Cost Reduction-**IoT enables patient monitoring in real time, thus significantly cutting down unnecessary visits to doctors, hospital stays and re-admissions.
  - **Faster Disease Diagnosis-**Continuous patient monitoring and real time data helps in diagnosing diseases at an early stage or even before the disease develops based on symptoms.

2 Blockchain

A blockchain collects information together in groups, known as blocks, that hold sets of information. Blocks have certain storage capacities and, when filled, are closed and linked to the previously filled block, forming a chain

of data known as the blockchain.This means if one block in one chain was changed, it would be immediately apparent it had been tampered with. If hackers wanted to corrupt a blockchain system, they would have to change every block in the chain, across all of the distributed versions of the chain.

- **Benefits-**
  - **Protection of healthcare data-**Blockchain's ability to keep an incorruptible, decentralized and transparent log of all patient data makes it a technology rife for security applications.
  - **Medical Supply Chain Management and Drug Traceability/Safety-** Blockchain has serious implications for pharmaceutical supply chain management, and its decentralization virtually guarantees full transparency in the shipping process
  - **Breakthroughs in Genomics-**the potential of genomics to improve the future of human health, once a dream, is now a scientific and financial reality. In 2001, it cost 1 billion to process a human genome. Today it costs about 1,000 dollar only.

3 Virtual Reality

Virtual reality(VR) is special kind of graphical user interface which presents a computer-generated immersive, three-dimensional, interactive environment that is accessed and manipulated using, for instance, stereo headphones, head-mounted stereo television goggles, and data-gloves.(VR), the use of computer modeling and simulation that enables a person to interact with an artificial three-dimensional (3-D) visual or other sensory environment.

- **Surgeons**VR can help Surgeons to do operation from distance
- **Mental health** can play a huge role in mental health,it can calm the mind by tavelling to different places from hospital only,it can decrease pain by distractcting the brain.
- **Practice**VR can help future medical surgeons to learn and practice