



RAJIV GANDHI INSTITUTE OF TECHNOLOGY

Blockchain in Healthcare

PRESENTED BY:

MOHAMMED WAQAR

1RG17CS032

UNDER THE GUIDANCE OF:

MRS. Deepti
Asst. professor,
CSE Dept.

ABSTRACT

Since blockchain was introduced through Bitcoin, research has been ongoing to extend its applications to non-financial use cases. Healthcare is one industry in which blockchain is expected to have significant impacts. Blockchain has the potential to substantially impact the healthcare industry as a whole and payers, providers and patients with respect to drug traceability, clinical trials and research, and data management.

Introduction

There are mainly three Use-Cases:

- **Drug Traceability:** Counterfeiting is a major problem for the pharmaceutical industry, 10 to 30% of drugs sold in developing countries are counterfeit.
- **Clinical Trials:** Mistakes or fraud may occur, Outcome switching, data dredging and selective publication of results may occur and may also affect protocol development.
- **Data Management:** Managing patient data requires complete access to individuals medical records to be shared among various clinicians and other professionals and to and from various locations.

Patient Data Management

Blockchain can provide a secure structure:

- **Users share information**
- **Information can be stored in smart contracts containing permissions and conditions for release**
- **Patients control access – private keys unlock access or third parties authorized by the patients can do so**
- **Can pull in other information from wearables and registries**
- **Companies are building personal health records (PHR) to align all stakeholders through patient engagement platforms and utilizing blockchains to implement**



Critical issues include:

- **Creating a trusted environment for determining how multiple providers can view, edit and share patient data while maintaining up-to-date records – that EHRs were not designed to manage,**
 - **Allowing providers to add new records and patients to authorize sharing**

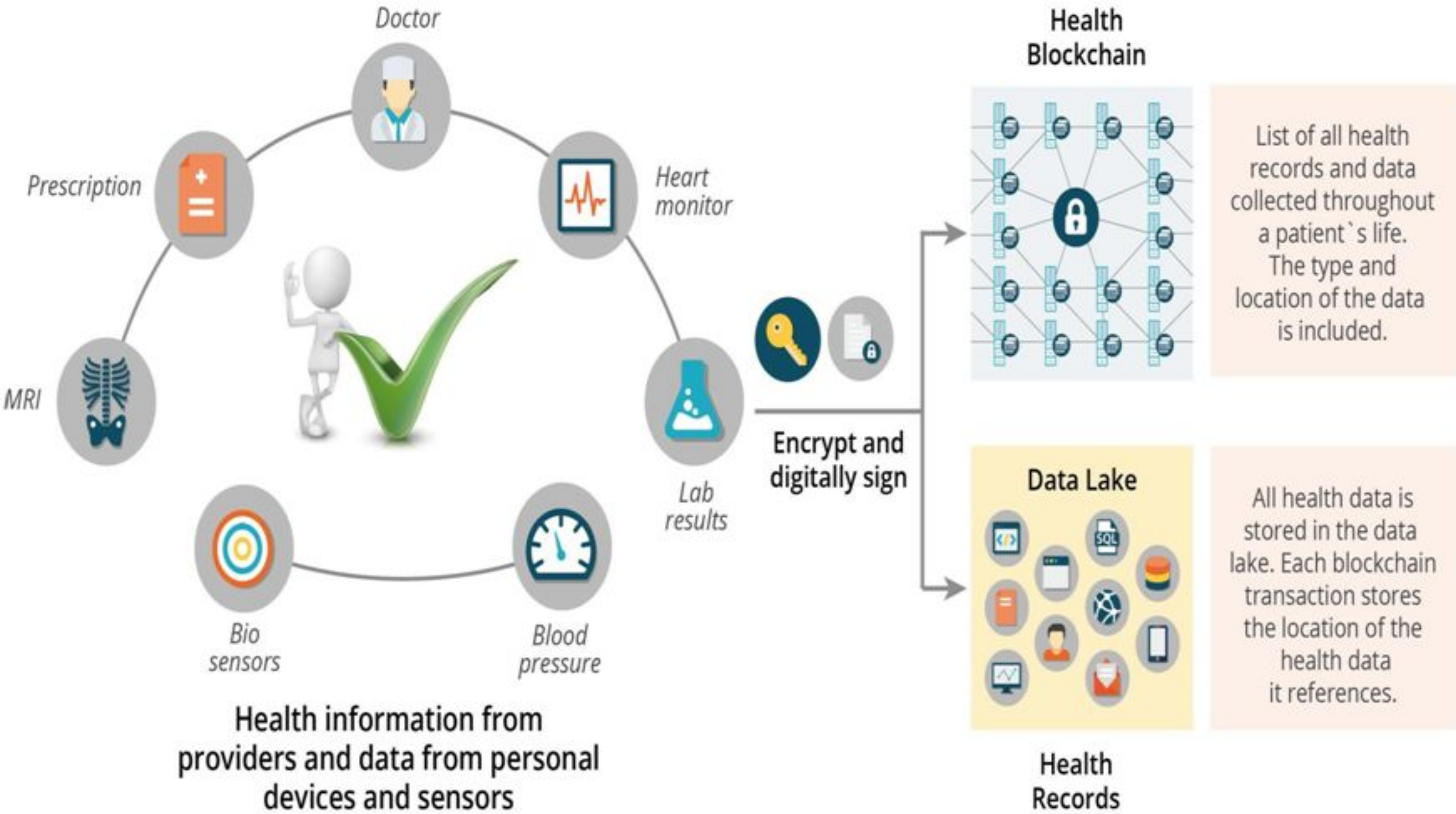
Blockchain can:

- **Address patient consent for data sharing not addressed by HIEs**
 - **Provide more tailored consents and update as desired**
 - **Create a system of “smart contracts” for a rule-based method for access**



Data on Blockchain:

- **Store certain data on the blockchain but still allow certain data to be accessed by secure links:**
- **On blockchain data could include age, gender and other personally identifiable information; be of the size and type to be stored and be immediately viewable**
- **Off blockchain data could include images and medical notes of any size or format that may have different requirements for the need to view.**
- **Blockchain could also collect information from web-based and mobile applications or other devices and becomes very important for digital health**
- **Development and other costs, concern of patients, scalability, storage limits and capacity are obstacles to be addressed**





Patient uses mobile device to assign access permission to data and to provide public key



Provider uses health application to access health data



Decrypt and authenticate digital signature



Health Blockchain



List of all health records and data collected throughout a patient's life. The type and location of the data is included.

Data Lake



All health data is stored in the data lake. Each blockchain transaction stores the location of the health data it references.

Health Records



Advantages

Blockchain technology offers many advantages for health care IT:

- **Blockchain is based on opens source software, commodity hardware, and Open API's.**
 - **These components facilitate faster and easier interoperability between systems and can efficiently scale to handle larger volumes of data and more blockchain users.**
 - **The architecture has built-in fault tolerance and disaster recovery, and the data encryption and cryptography technologies are widely used and accepted as industry standards.**
 - **The health blockchain would be developed as open-source software.**



Conclusion

The most efficient and effective approach for advancing interoperability objectives would be to establish a national technology infrastructure for health IT based on open standards.

Open API's based on industry best practices are vital and essential to addressing interoperability

The acquisition, storage and sharing of this data would lay a scientific foundation for the advancement of medical research and precision medicine, help identify and develop new ways to treat and prevent disease and test whether or not mobile devices engage individuals more in their health care for improved health and disease prevention.



THANK YOU