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October 2022

## What is the potential for the use of AI and Blockchain in Healthcare?

Junior Member Presentation



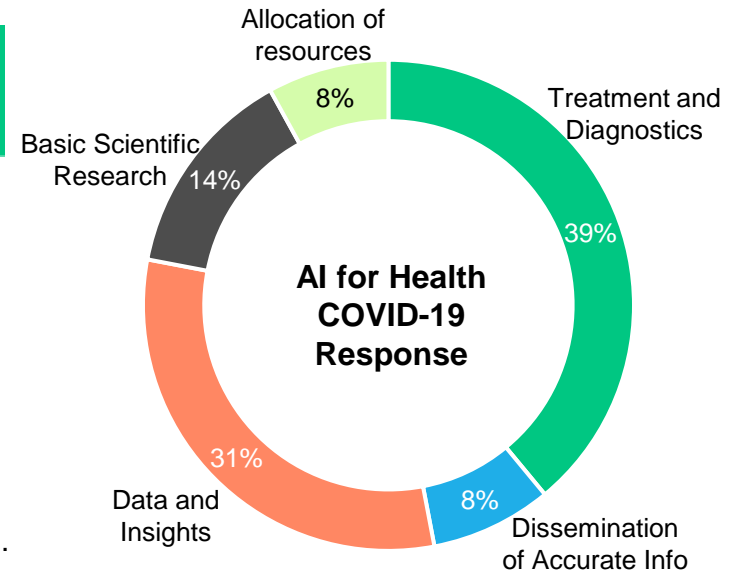
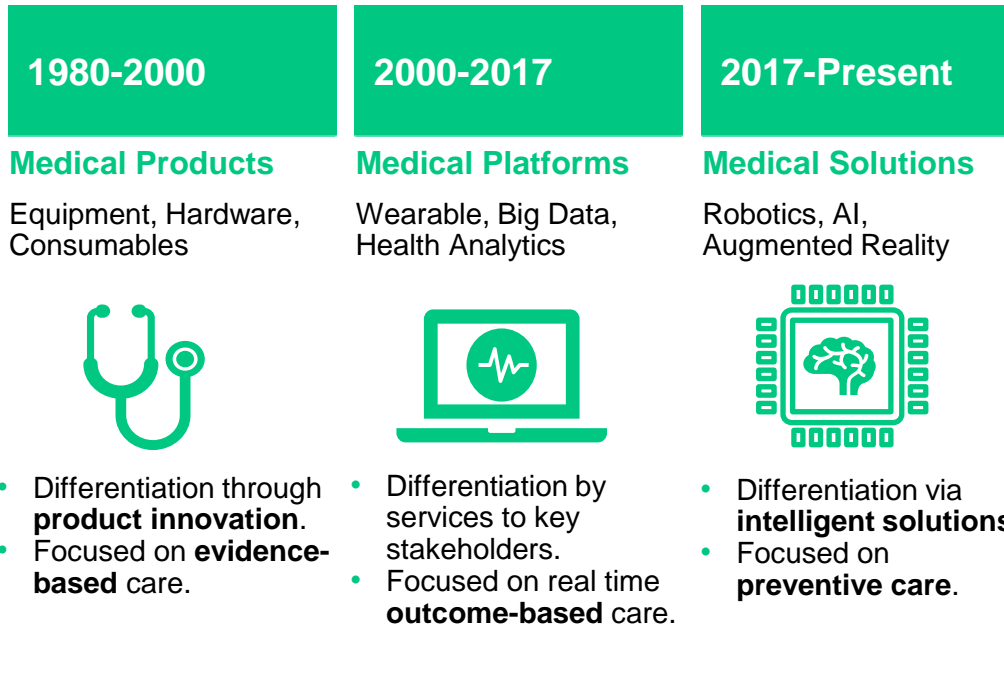
Nistha Agarwal  
LU – Technology  
IIT Bombay



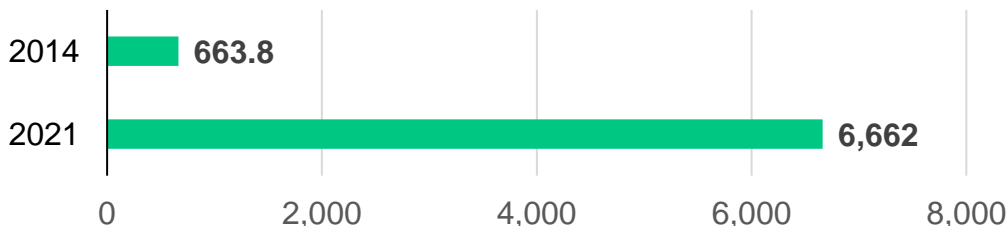
# Executive Summary

- **After COVID 19, AI in healthcare market witnessed a 55.0% growth between 2020 and 2021**
- **AI has transformed healthcare and is most widely perceived to be delivering value in speciality care telehealth**
- **Scaling up of AI in healthcare can be planned in 3 phases with the potential of assisting medical practitioners in multiple fields**
- **The global blockchain technology in healthcare is projected to grow at a CAGR of 63.85% from 2017 to 2025**
- **Increased research in blockchain has the potential to solve key industrial pain points**
- **Scaling up of blockchain and its integration with AI leads to improved security and high efficiency**
- **Personalized and intuitive patient centric ecosystems will be the major set-up in the future**
- **Blockchain and AI has enhanced security of patient data and have the potential to optimize current workflows and disintermediate some high-cost gatekeepers**

# After COVID 19, AI in healthcare market witnessed a 55.0% growth between 2020 and 2021



## Artificial Intelligence Market for Healthcare Applications, World, 2014,2021 (in Millions)



### Pandemic Impact

- AI in healthcare market grew at a rate of **167.1% from 2019 to 2021**
- Pandemic supported the growth of AI in healthcare used for diagnosis, clinical trials, and virtual assistants

### Post COVID Outlook

- Market is estimated to witness a **year-on-year growth** in the range of **34.9% to 48%** in the next 5 years
- Need to **minimize expenses**, rising demand for **value based care**, need for **quick diagnosis** is boosting AI technologies
- Market players are devising technological partnerships to **sustain growth trajectory** of the industry.

# AI has transformed healthcare and is most widely perceived to be delivering value in speciality care telehealth

## Transformation in healthcare as a result of AI



**Keeping Well** : The use of AI and the Internet of Medical Things (IoMT) in **consumer health** applications is already helping people



**Early Detection** : AI is enabling review and translation of mammograms **30 times faster** with **99% accuracy**



**Diagnosis** : IBM's Watson for Health can review and store medical information **exponentially faster** than any human.



**Decision Making** : Using pattern recognition, AI is able to **identify patients at risk** of developing a condition



**Treatment** : AI can help clinicians take a more **comprehensive** approach for disease management.



**End of Life Care** : AI with humanoid design enable robots to have **social interaction** to keep aging minds sharp



**Research** : Advances in AI have the potential to significantly cut both the time to market for new drugs and their costs.

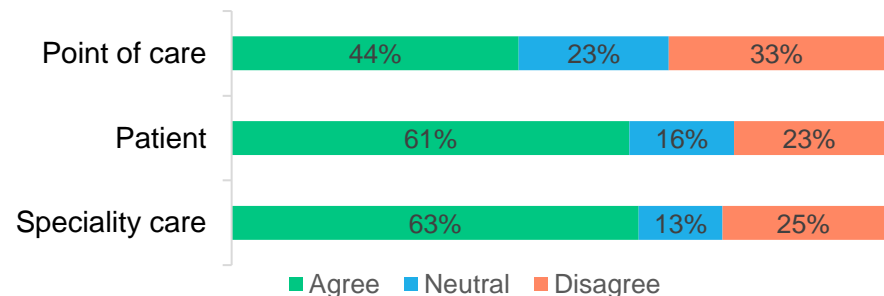


**Training** : AI allows those in training to go through naturalistic simulations in a way that simple computer-driven algorithms cannot.

## Areas of impact of AI in Healthcare



## Areas AI is delivering value in

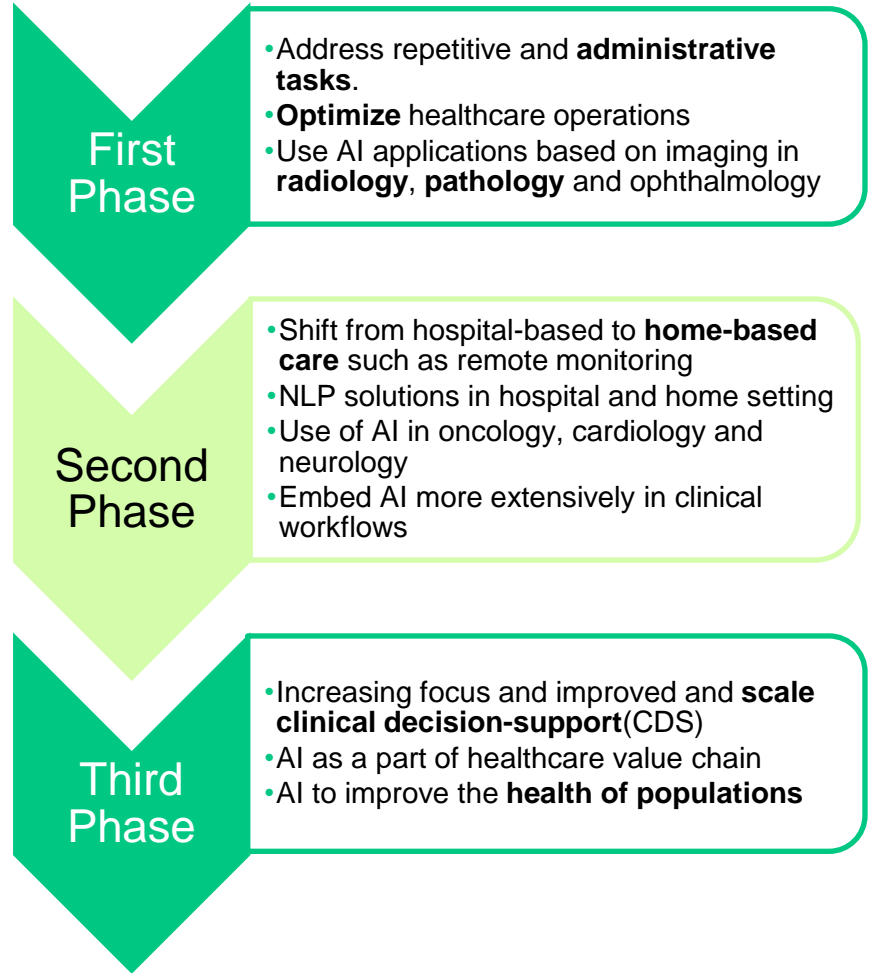


# Scaling of AI in healthcare can be planned in 3 phases with the potential of assisting medical practitioners in multiple fields

## Occupations automated as a result of AI



## Three phases of scaling AI in healthcare



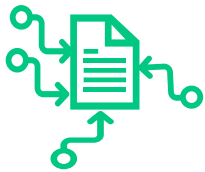
\*NLP –Natural Language processing

Source : MC Kinsey : Transforming healthcare with AI

# The global blockchain technology in healthcare is projected to grow at a CAGR of 63.85% from 2017 to 2025

## Challenges that healthcare industry faces

### Conventional Data collection



Lack of secured structure to allow data interoperability

### Data Accessibility



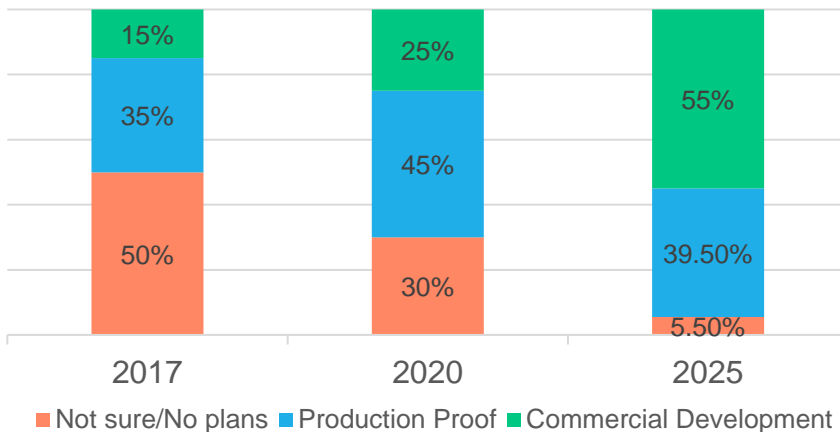
Limited access to PHI limiting efficiency

### Data privacy & security



Lack of privacy and security of patient data

## Projected share of healthcare blockchain adoption across healthcare applications worldwide



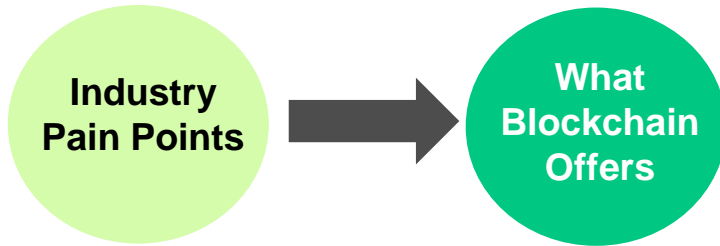
\*HIPPA – Health Insurance Portability and Accountability Act  
 GDPR – General Data Protection Regulation  
 Source : The Healthcare Guys : Application of Blockchain in Healthcare  
 BIS Research

## Applications of Blockchain in Healthcare

- Solving for Interoperability**
  - Creates a **data management** system
  - Helps to couple patient and health data in a secured system
- Securing Supply Chain**
  - Transactions are recorded in a **secured ledger**
  - Helps healthcare vendors to track components
- Giving patients control over their data**
  - Requires a **key to access** every distribute ledger
  - Help patients to take control of their data
- GDPR and HIPAA Compliance**
  - Secure and **immutable** environment is security friendly
  - In compliance with GDPR and HIPPA
- Smart contracts and automation**
  - Smart contracts can **integrate** the process between patients, healthcare providers and insurance agencies
- Accelerating R&D**
  - Helps in maintaining, validating, ensuring the **adherence to trial protocols** by pharma and MedTech companies

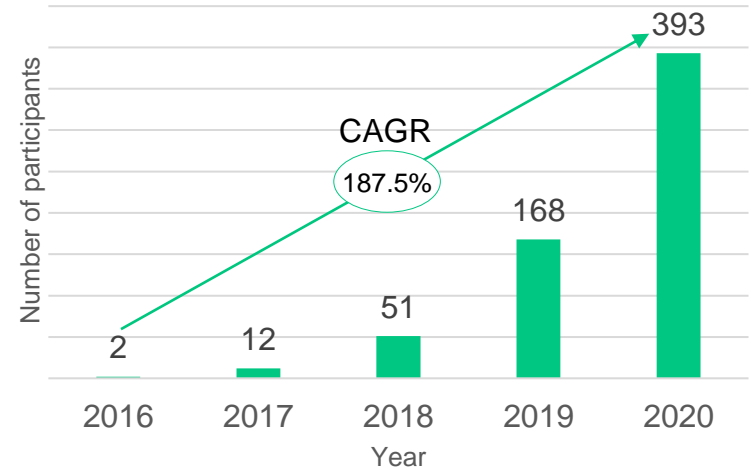
# Increased research in blockchain has the potential to solve key industrial pain points

## Potential impact of Blockchain on healthcare

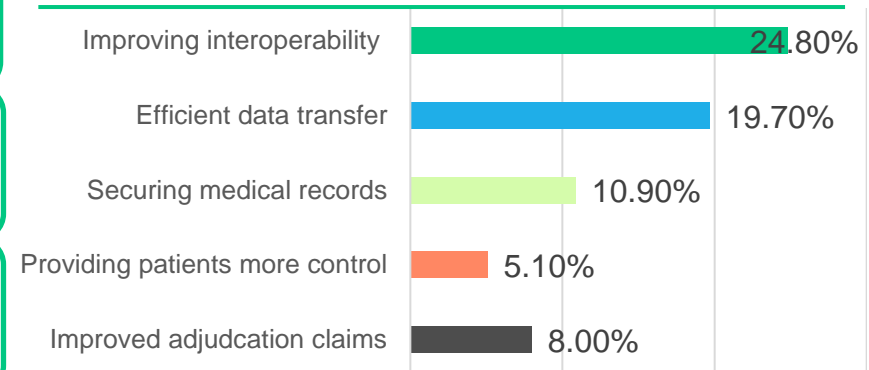


Different data standard and non-standard API for accessing patient data	Provides a <b>platform for sharing data in real-time</b> on a trusted network
Patients have limited access to their own health records and data is not leveraged across providers	Blockchain can potentially provide <b>access to patient data</b> in a secure manner
Permission issues in accessing the right information at the right time from various sources	Smart contract can potentially <b>solve data access issue</b> , providing access at right time
Uniform identity issues across care givers	Public and private key pair can <b>solve the identity issue</b>
Lack of meaningful use of data for research and innovation	Availability of <b>anonymized data</b> on Blockchain for mining

## Published research on Blockchain in Healthcare



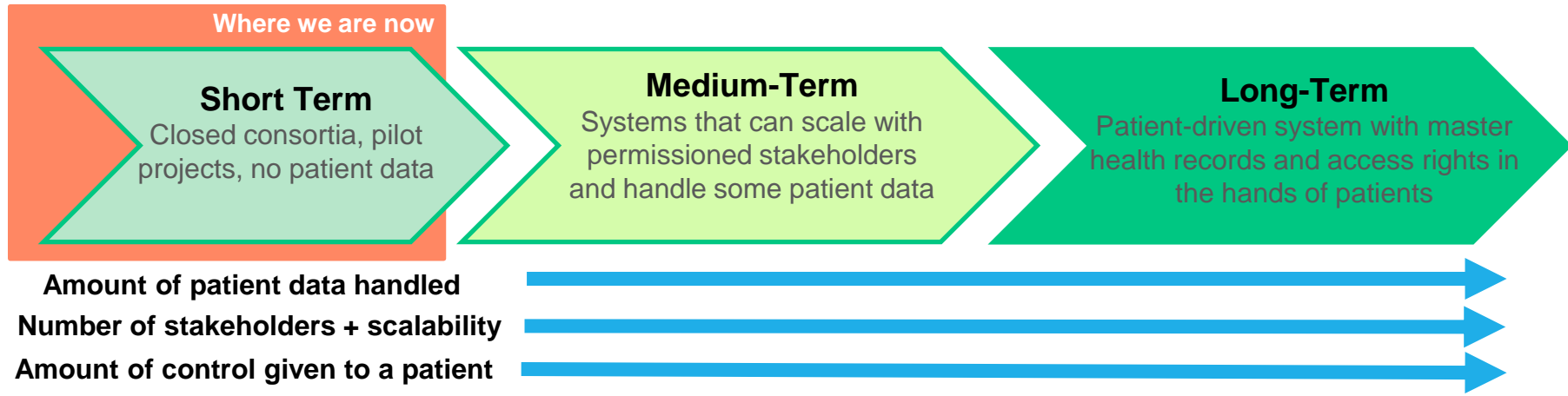
## Rate at which blockchain is expected to gain traction in key areas



# Scaling up of blockchain and its integration with AI leads to improved security and high efficiency

## Blockchain + Healthcare : A Potential Roadmap

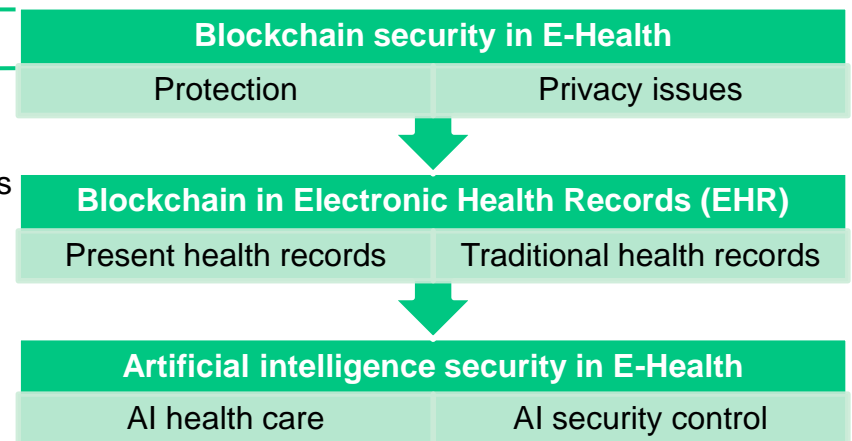
Use case for blockchain will start in small projects that reduce duplicative work but can eventually shift to a system where patient's control access rights to their data



### Key features of blockchain integration with AI

Blockchain	AI	Integration benefits
Decentralized	Centralized	Enhanced information <b>security</b>
Deterministic	Changing	Improved <b>trust</b> on robotic decisions
Immutable	Stochastic	Making <b>evidence</b> based decisions
Data Integrity	Volatile	<b>Decentralized</b> intelligence
Attacks resilient	Data centric	High <b>efficiency</b>

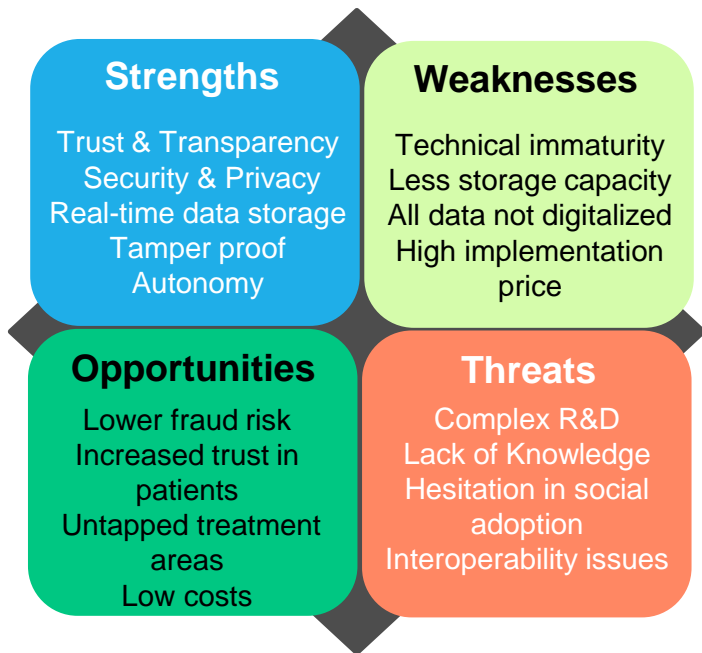
### Blockchain and AI security in e-Health



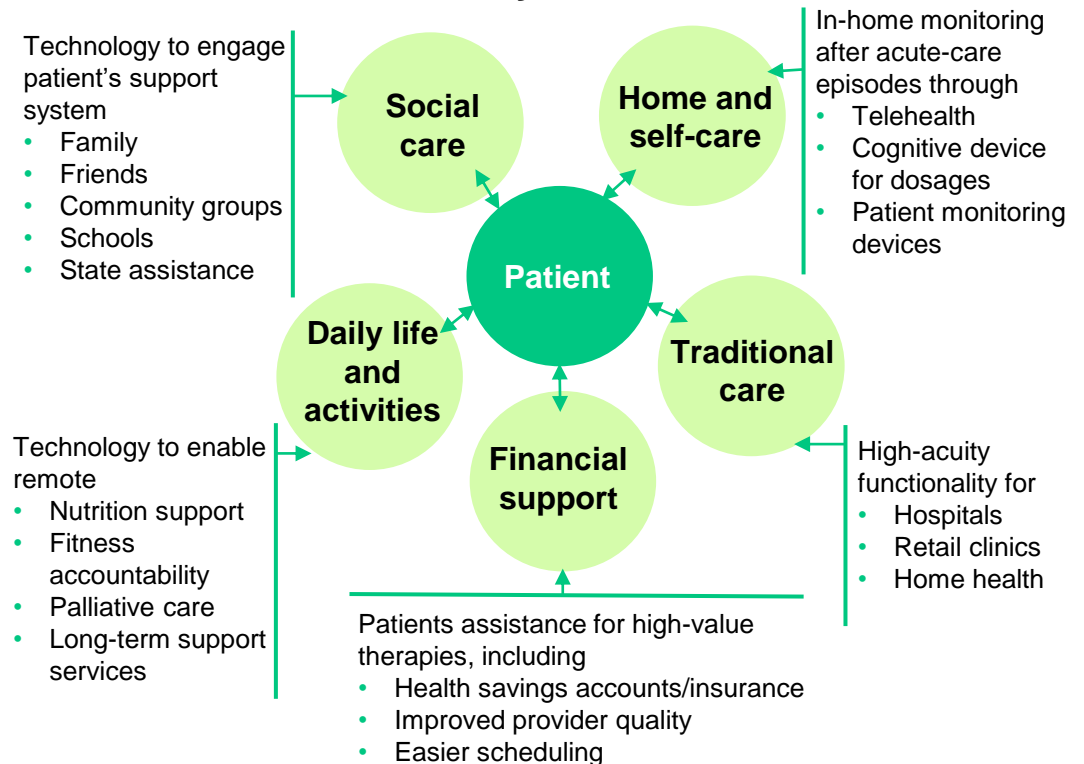


# Personalized and intuitive patient centric ecosystems will be the major set-up in the future

## SWOT analysis of Blockchain and AI in Healthcare



## New, personalized, and intuitive healthcare patient centric ecosystems



## Transformational capabilities

AI-ENABLED CARE	SMART WORKFORCE	AUTONOMOUS MONITORING	PERSONALIZED SERVICES	DIGITAL AUTHORIZATION
Monitoring, routing, and delivery of virtually/in-person	AI-driven tools optimize resource and talent allocations	Anomaly identification across the healthcare ecosystem	AI-assisted call centre, sales agents, and voice analysts	Frictionless automation and next-gen contracting

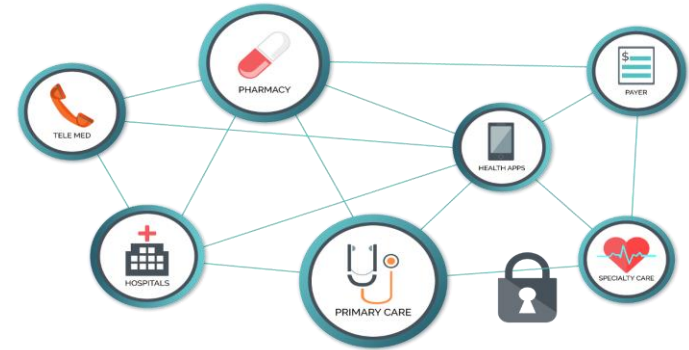
# Blockchain and AI has enhanced security of patient data and have the potential to optimize current workflows and disintermediate some high-cost gatekeepers

## Use cases of Blockchain and AI in various companies

### Health Security



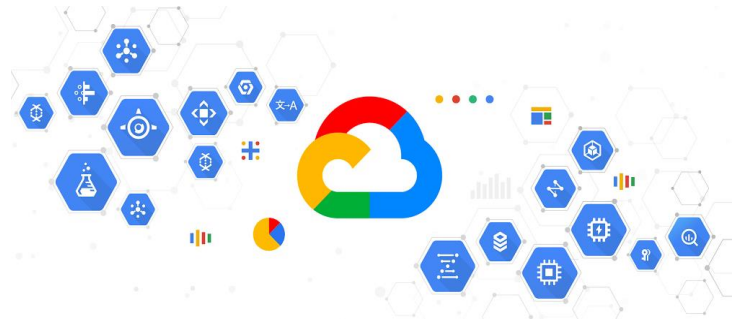
- Tackles **security** concern through blockchain
- Ability to identify **drug addiction** early
- Beneficial for tracking and **avoiding drug misuse**



### Genomic Market



- Customers can share **genomic data** with researchers
- AI used to predict occurrence of **allergic reactions**
- Employs blockchain **encryption** to ensure security of data



### Medical Supply Chain



- Leverages blockchain to combat the problem of **counterfeit** and inferior pharmaceuticals
- Allows customer to **trace legitimacy of drug** at time of purchase

