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**DECENTRALISED HEALTHCARE ECOSYSTEM**

# **1 Topics**

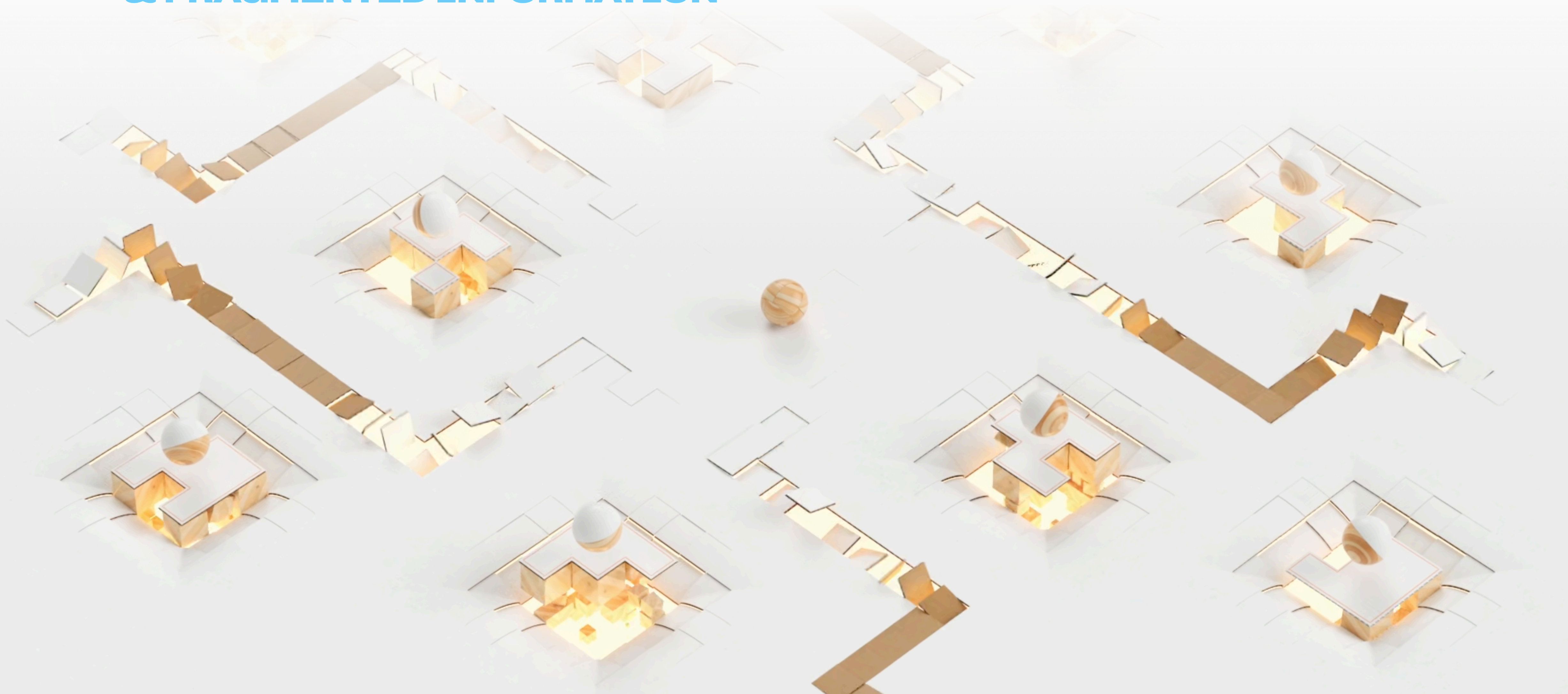
- 1 Current state of healthcare IT and reasons for it**
- 2 Why it needs to change and how**
- 3 How blockchain can help**

## **II Good data and good IT can...**

- Lower costs while improving quality of care through digitalisation of workflows.
- Move healthcare from acute to preventive treatment through predictive algorithms, monitoring.
- Provide more comprehensive data that in turn enables new discoveries through big data analytics, machine learning, AI.
- Enable life-saving telemedical consultations.
- Create new interactions between researchers, doctors and patients.
- ...

# **I 1 Contemporary Healthcare IT**

**ISOLATED STAKEHOLDERS, CENTRALISED DATA  
& FRAGMENTED INFORMATION**





# **:I Contemporary Healthcare IT**

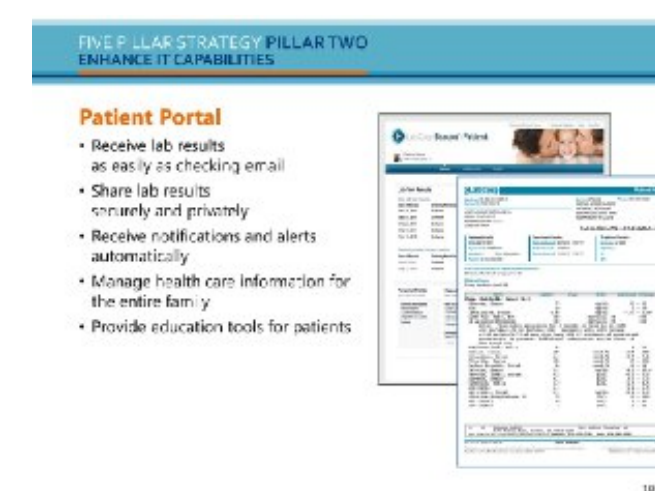
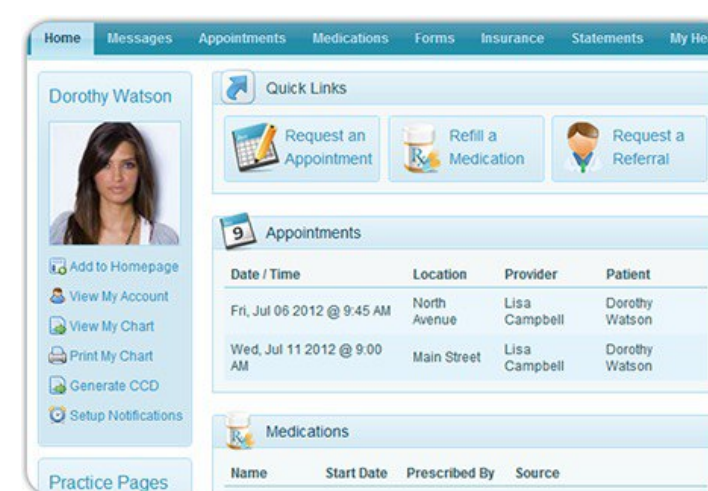
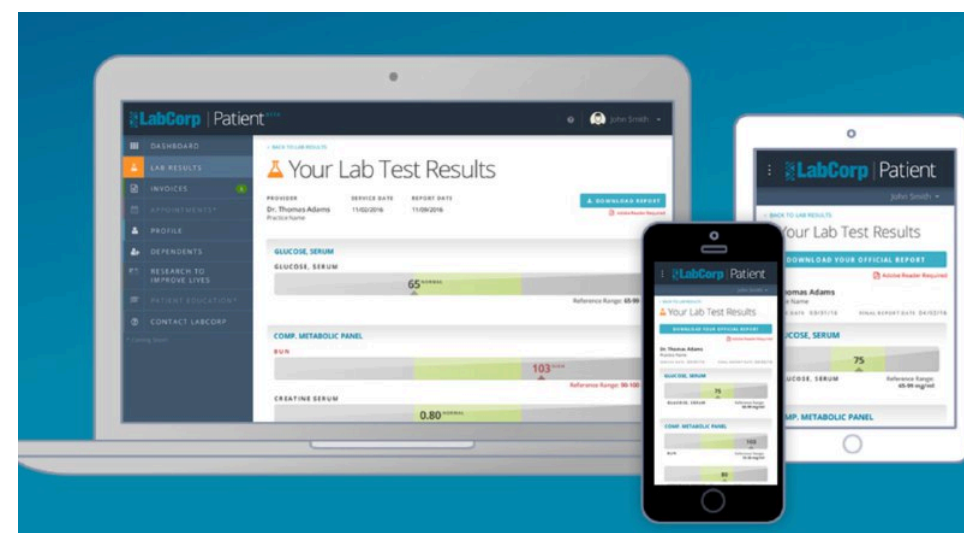
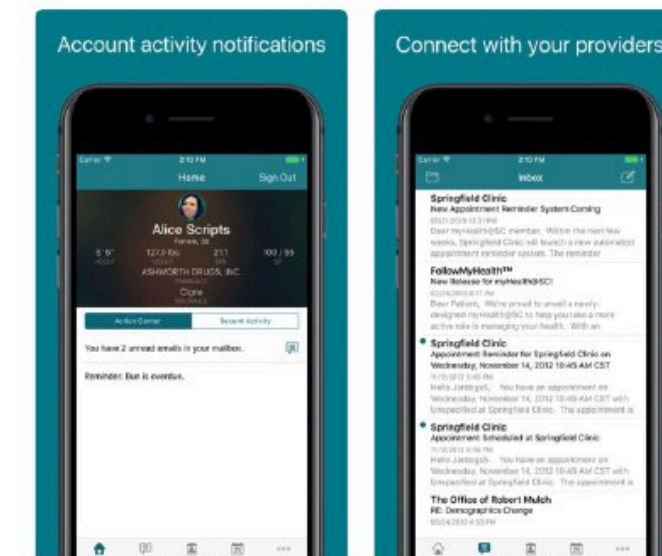
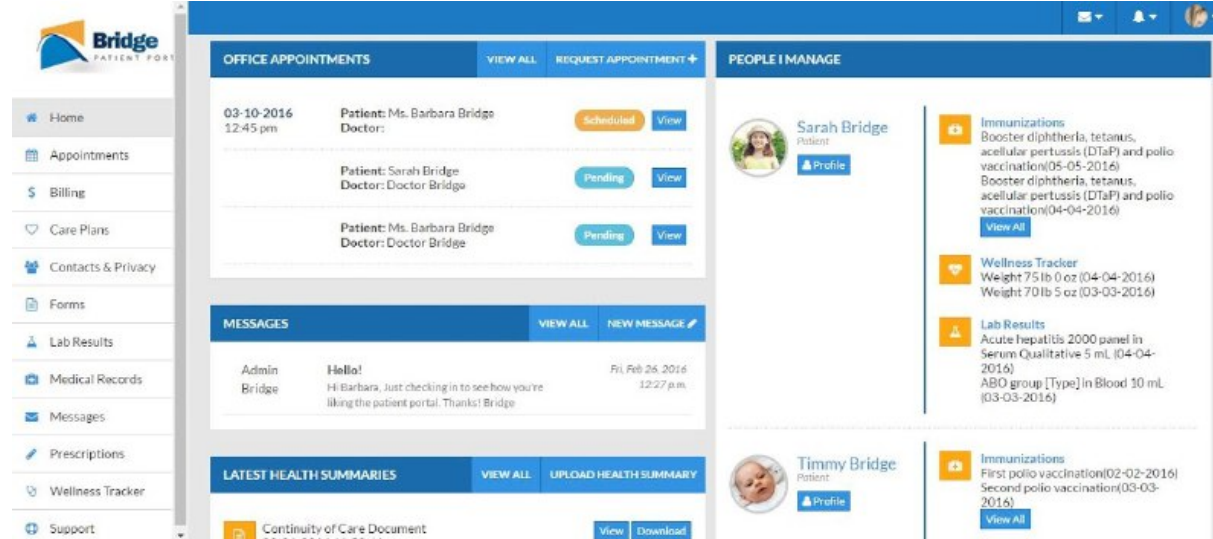
- 1** Landscape of isolated islands.
- 2** Multitude of languages and dialects.
- 3** Limited communication and information exchange
- 4** Lack of effective defence. Common ransomware attacks.
- 5** Centralised and localised systems.
- 6** Limited research field

# I Disconnected Solutions

## Optimize their fitness

With Vo2max and RMR Testing

- Find the precise level of exercise intensity to burn fat, maximize recovery, and optimize performance.
- Optimize metabolic and heart health using the single best predictor of all cause mortality.



# **:I Participants in Contemporary Healthcare IT**

## **CLINICIANS**

**Segregated data and platforms steal time away from patients during their daily workflows. Data that can help deliver life saving decisions remains untapped.**

- Fragmented and limited clinical data.
- No complementary data (wellness & lifestyle), missing context.
- Data sharing for specialist opinion difficult.
- Diagnostics devices not integrated => double the work.
- No freedom to choose suitable software.
- Limited possibility for remote monitoring, automated alerts.





# **:I Participants in Contemporary Healthcare**

## **RESEARCHERS**

**Instead of doing research, half of the time is spent on collecting, structuring, contextualising data, developing proprietary analytics tools.**

- Patient consent to use data for research is easy, getting actual data is extremely difficult.
- Complementing clinical data with genetic and wellness data rarely possible.
- Expanding hypotheses testing to larger population is expensive.
- Difficult to find an appropriate population sample and/or data set.
- Preserving anonymity is a constant struggle.





# **I Participants in Contemporary Healthcare**

## **PATIENTS**

**Patient data is a hostage of proprietary ecosystems. Access is limited and controlled by third parties, while the data is too fragmented to provide any relevant and actionable information.**



- Relying on personal memory to accurately describe their health conditions and history.
- When moving to a different city (or country), health records are left behind.
- Gathering data needed to get a second opinion is slow and difficult.
- Personal information is exposed through hacks or victim to ransomware.
- Home-use diagnostics device not integrated with electronic health records.

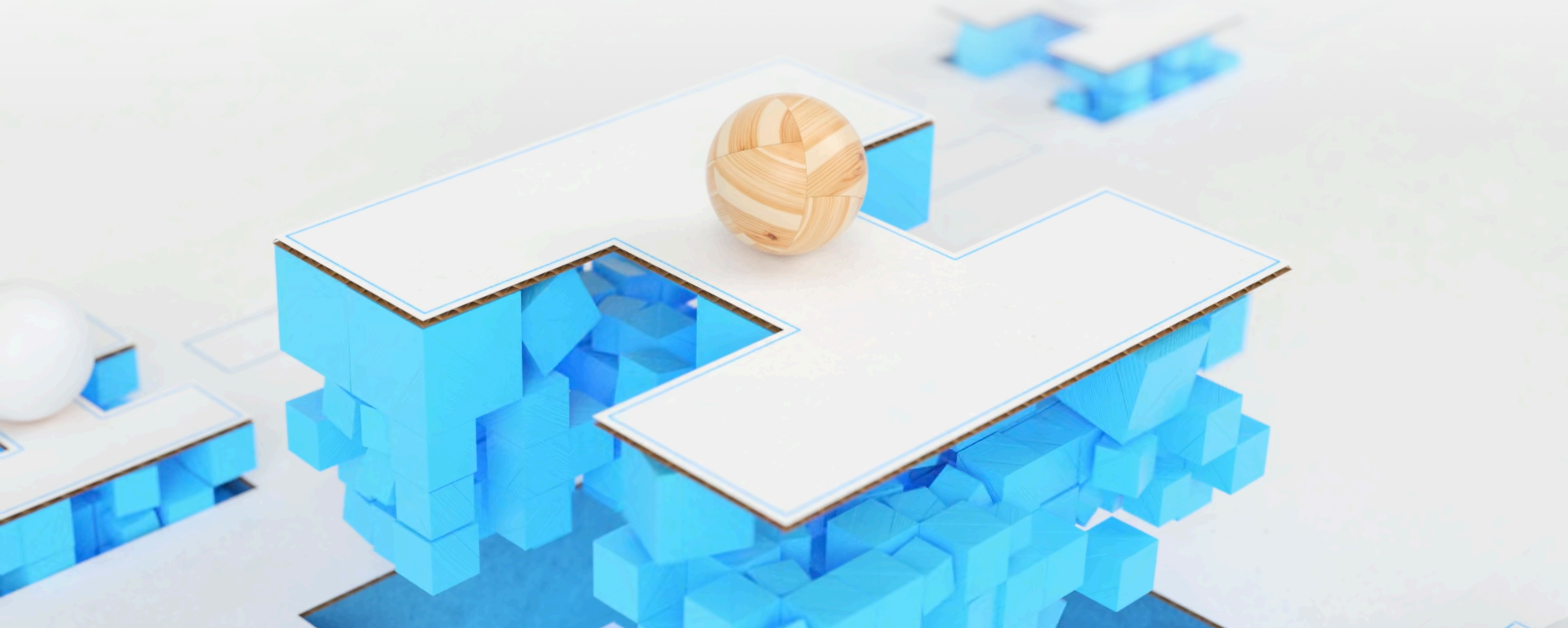
## **II Why?**

- Healthcare IT vendors love proprietary data formats, closed ecosystems, because it guarantees vendor lock-in.
- Healthcare providers are risk-averse and always pick established companies for the IT.
- Decisions are made top-down.
- Patients have no say in it.



# **:I 2 Healthcare for the 21<sup>st</sup> Century**

**INTERCONNECTED STAKEHOLDERS, DECENTRALISED ACCESS  
TO HEALTHCARE DATA & HOLISTIC INFORMATION**





# **II Decentralised Access to Healthcare Data**

## **User-centricity**

Healthcare data from various sources gravitates towards the patient.

## **Interoperability**

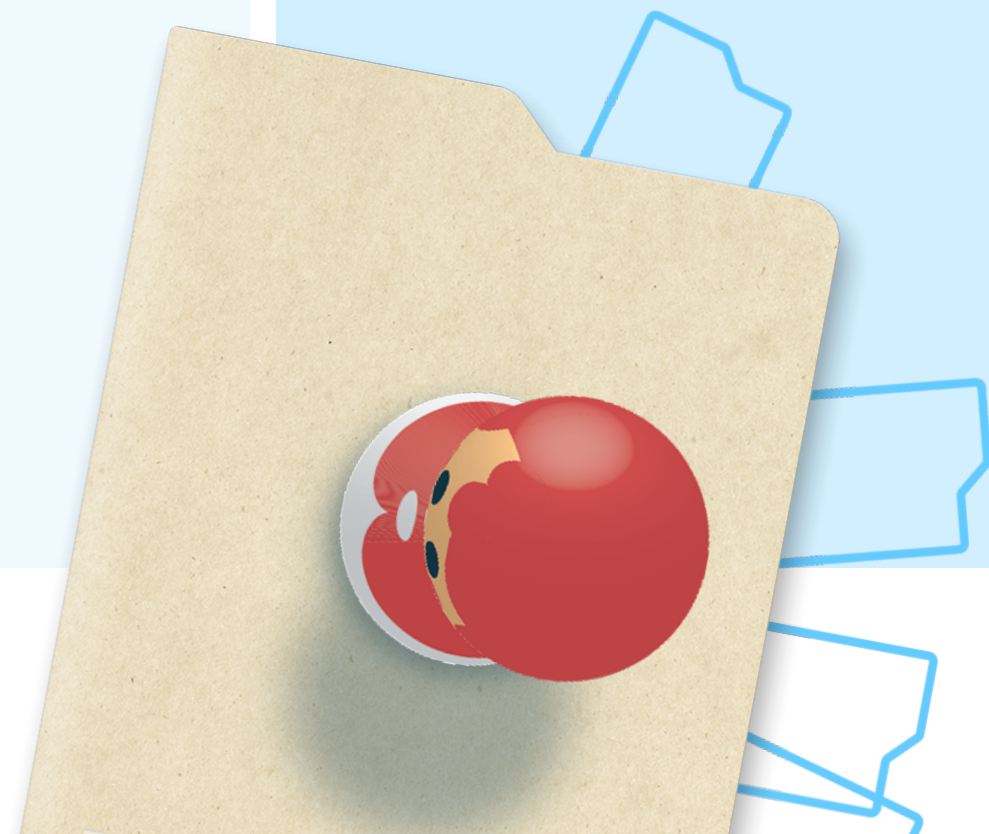
Data is structured and readily available for the patient to share with whomever they wish.

## **Accessibility**

Direct links between all participants (patients, clinicians, researchers, devices).

## **Usability**

Democratised access to data enables a thriving application ecosystem.





# **II How**

## **1 Platformization:**

- Open standards.
- Open access.
- Developer resources.

## **2 Patient ownership of data:**

- Data must be a bearer instrument (“Control is ownership.”).
- Patient is the ultimate decision-maker.
- But needs tools to safely keep data (backup&restore, security).

# **How**

## **3** Trust & Transparency:

- Software should be open source.
- Access control list must be immutable and verifiable.
- There should be no central administrators with unrestricted rights and permissions.

## **4** Adoption:

- The basic, but fully functional solution, must be free.
- Usability and user experience is important.
- Must solve immediate problems for stakeholders (not tackling systemic problem).

# **3 How Blockchain can help**



# **:I What Blockchain is NOT (solving)...**

- 1 Blockchain is a database that solves the data interoperability issue.**
- 2 Blockchain makes data automatically more secure.**
- 3 Blockchain creates backups of data and thus prevents data loss.**
- 4 With blockchain, all participants can communicate with each other.**



# **:I What Blockchain is great for...**

- 1 Preventing data tampering.**
- 2 Having a decentralised, immutable ledger of data viewing rights.**

# **:I In combination with other technologies...**

- 1 OpenEHR & Snomed**
- 2 Zero-knowledge data storage**
- 3 Private key management**
- 4 Blockchain**

# **Iryo Network**

- Solution for standardised healthcare data storage and management.
- Data is stored on the user/patient's device.
- Access to that data is controlled by the patient.
- Network is permissionless (anyone can join under certain conditions).

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