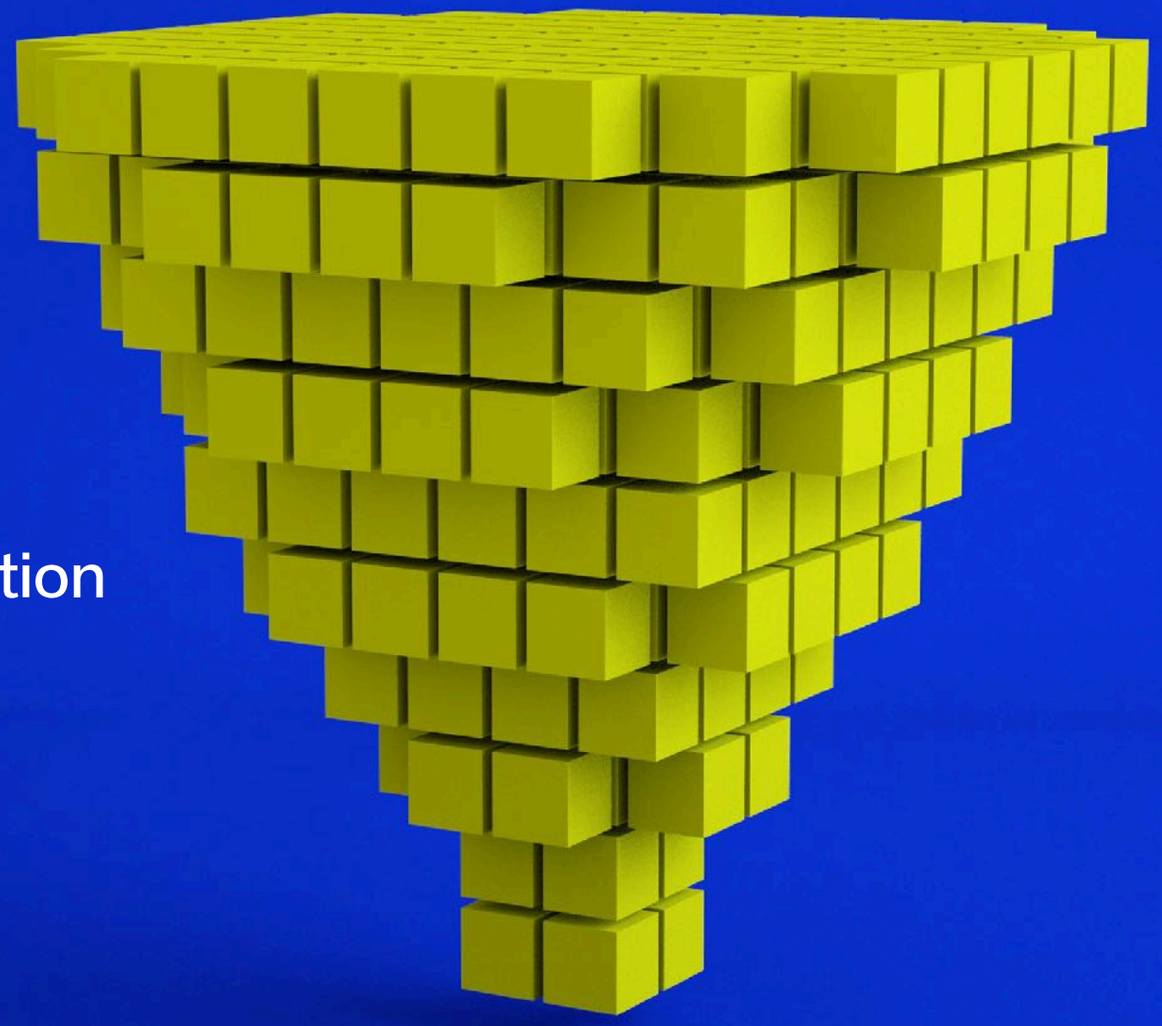
PHDC

Personal health data storage and circulation blockchain



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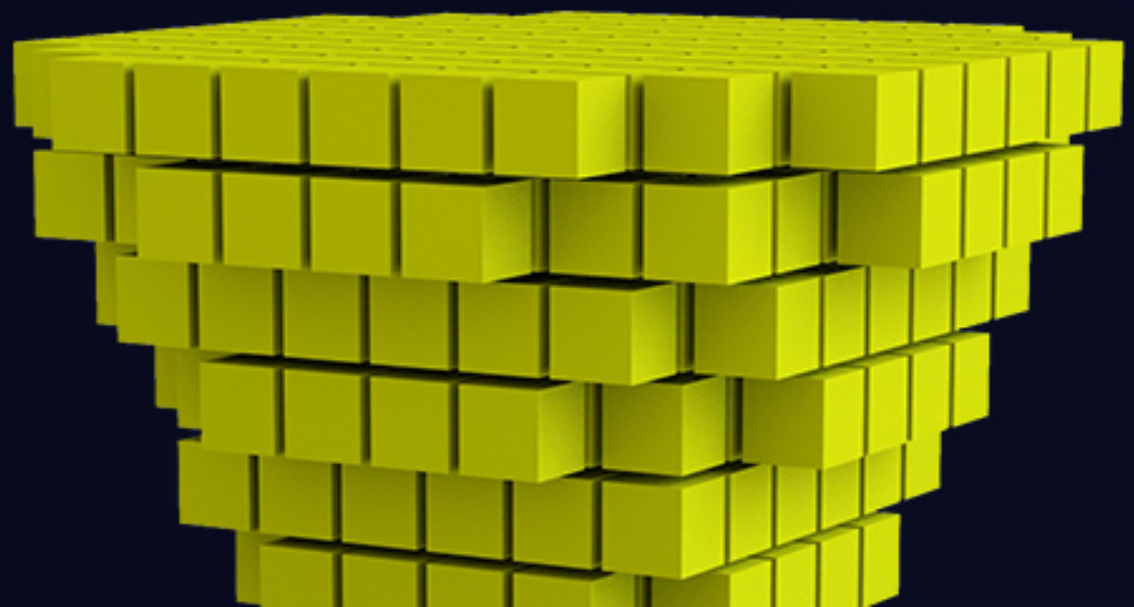
Pain points and business value

Part 1

Architecture and Processes

Part 2



Part 1 Pain points and business value

1. What is PHDC
2. Resolved pain points
3. Business value and meaning

Part 1 Pain points and business value

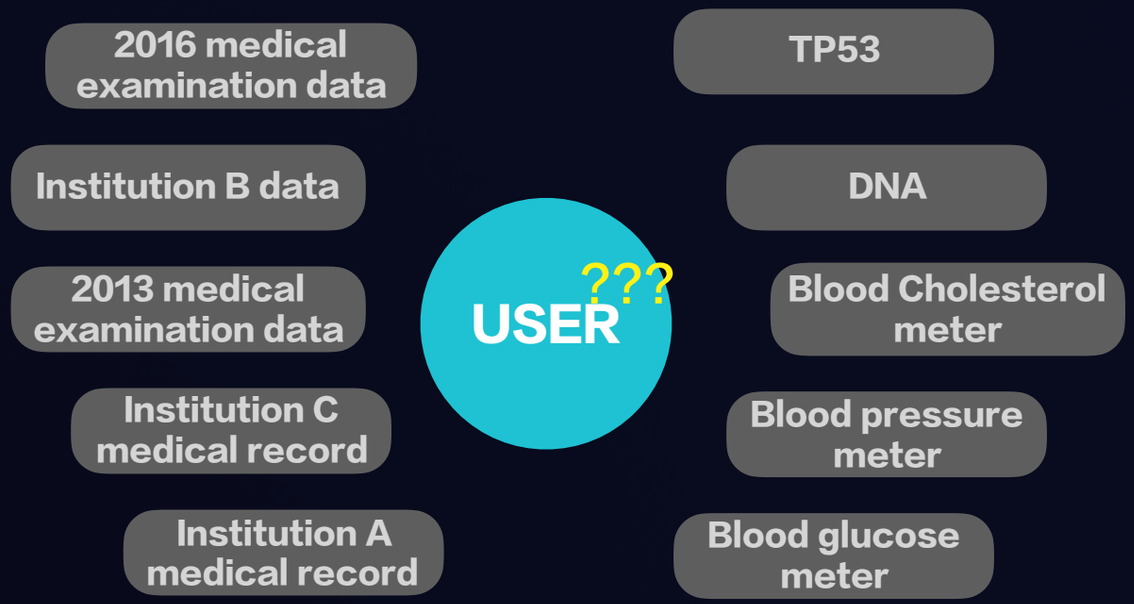
What is PHDC

PHDC (Personal Health Data Chain) is a personally authorized health data storage and distribution platform based on Hyperledger Fabric. It achieves three main goals:

1. Data ownership and the right to use separate
2. Maximize personal privacy and institution's data security
3. Establish a neutral, trusted, and secure data transaction process

Part 1 Pain points and business value

Resolved pain points

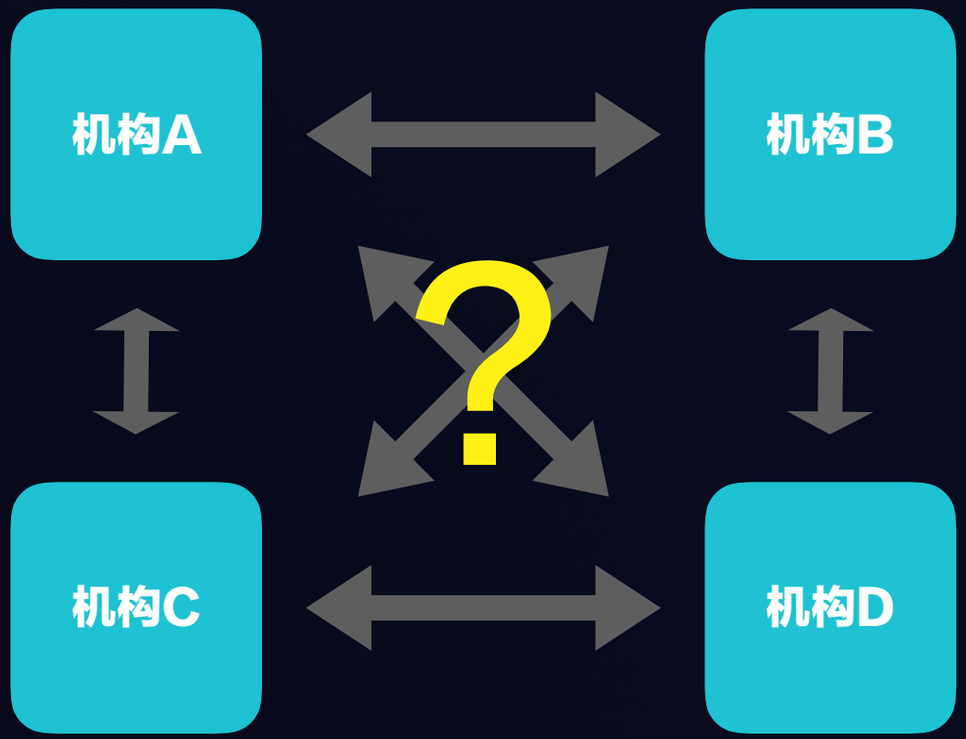


User's data does not belong to the user

With the development of technology, the data generated by users is diversified, but the user's data cannot be effectively circulated between organizations, resulting in reduced data value, duplicate data, and inability to generate valid data for long-term tracking, and users cannot determine the flow and use of data

Part 1 Pain points and business value

Resolved pain points



Data between institutions cannot be circulated

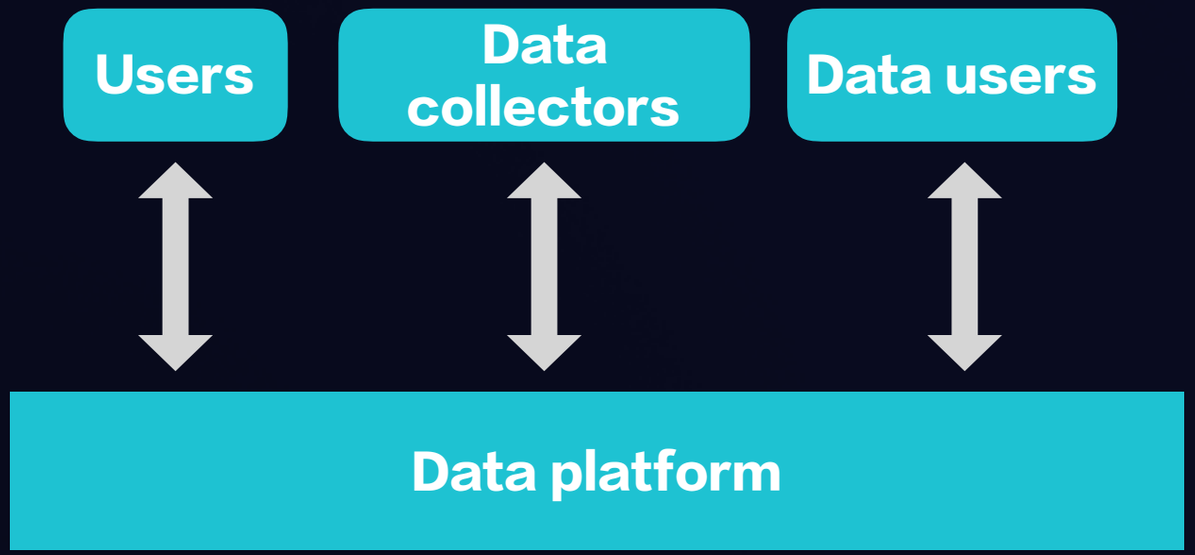
Because the system is different between institutions, the complexity of opening data through the API is extremely high.

The data between the institutions differs in value and range due to different collection methods, collection devices, reagents, etc.

There is a privacy leak in the flow of data between institutions, and it is difficult to ensure data security and effectiveness.

Part 1 Pain points and business value

Resolved pain points

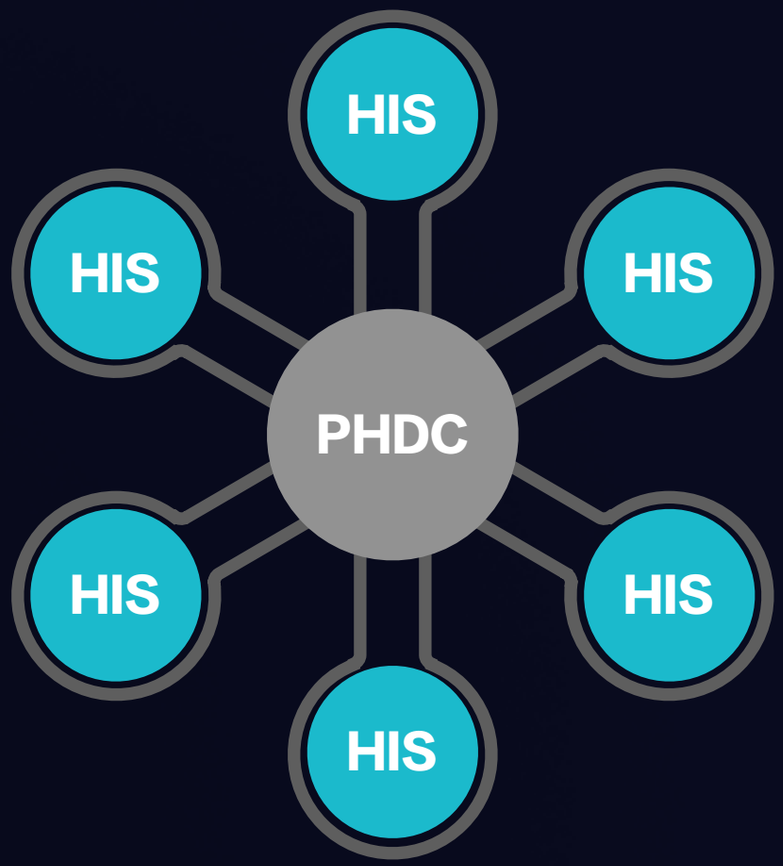


Solution

In the past centralized network architecture, it is very difficult to achieve a neutral and trusted data platform, and the centralized storage platform will face higher performance requirements and security requirements. Based on Hyperledger Fabric, we are able to achieve completely neutral and reliable data storage on the distribution platform under the premise of lower cost and more security.

Part 1 Pain points and business value

Business value and meaning



Maximum compatibility

1. Breaking the original process greatly increases the cost and difficulty of blockchain popularization
2. PHDC exists in the form of additional processes of HIS (Hospital Information System) and even in the form of a backend database, which greatly reduces the difficulty of organization migration.
3. In terms of data standardization, we have used AI system to analyze the processing experience of hundreds of thousands of medical examination reports of the four major medical institutions in China.

Part 1 Pain points and business value

Business value and meaning

Reduce data barriers

1. From the combination of traditional medicine and genetics, the treatment and health management of multiple data sources has become a trend.
2. Open up a variety of data sources such as physical examination data, genetic data, medical record data, and smart devices
3. Generate more integrated health management and treatment methods to accelerate the development of the health industry

Part 1 Pain points and business value

Business value and meaning

1. It greatly reduces the data acquisition cost of enterprises with large demand for health data such as insurance and pharmaceutical industries, shortens the data acquisition cycle, and even transfers the value of data acquisition costs, so that data collectors and owners can make more profits.
2. It can reduce or even eliminate the observation period of health insurance, and achieve accurate underwriting based on complete health data, effectively reducing premiums and increasing profits.
3. Returning the ownership of the data to the user, allowing the user to determine the use of the data, while greatly protecting the user's privacy, greatly increasing the value of the data itself

Part 1 Pain points and business value

Business value and meaning

Exposed information

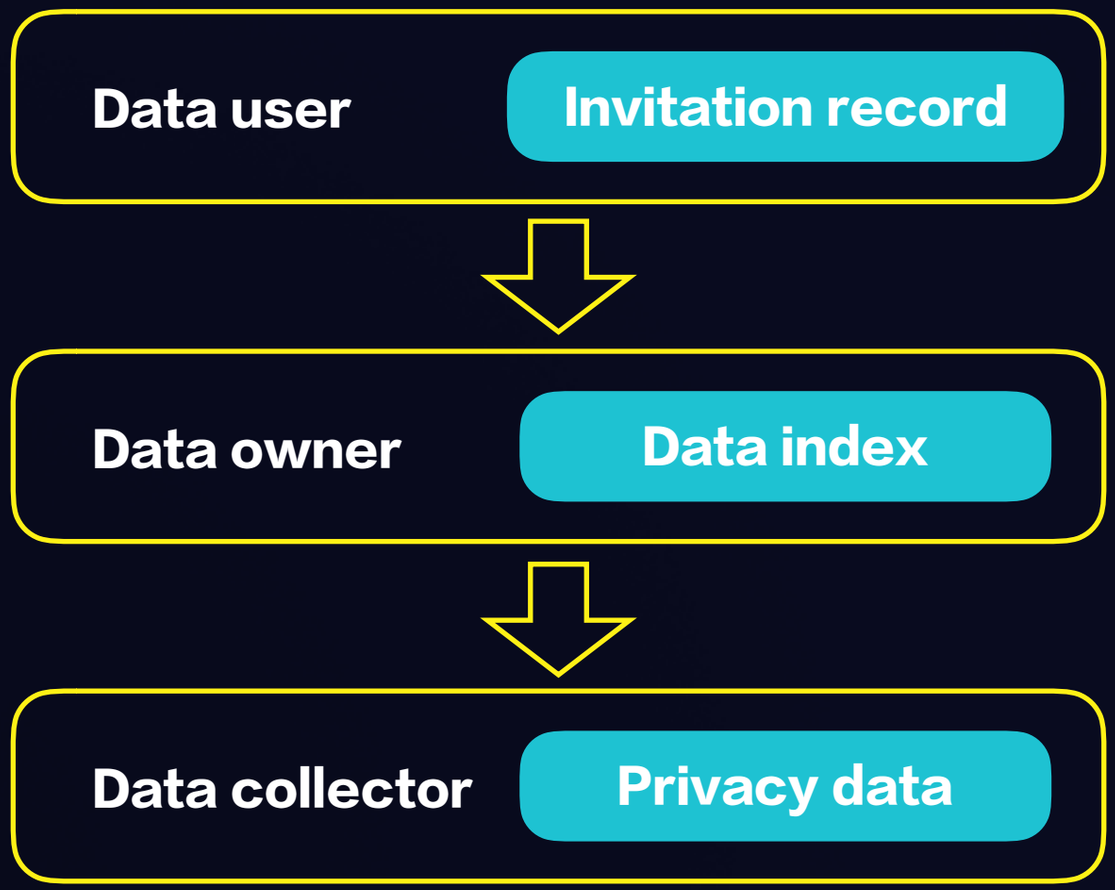
Privacy information

Minimum privacy exposure principle

1. User data selectively exposes data that does not contain sensitive information according to the importance of privacy, hiding health data from the index
2. The data of the health organization is controlled by the user, and is not exposed except for the corresponding user extraction.
3. The data user saves the encrypted invitation record in the shared channel, and it is difficult to traverse the institutional invitation record.
4. Provide request data according to templates, simplify data extraction process, and standardize data requirements

Part 1 Pain points and business value

Business value and meaning



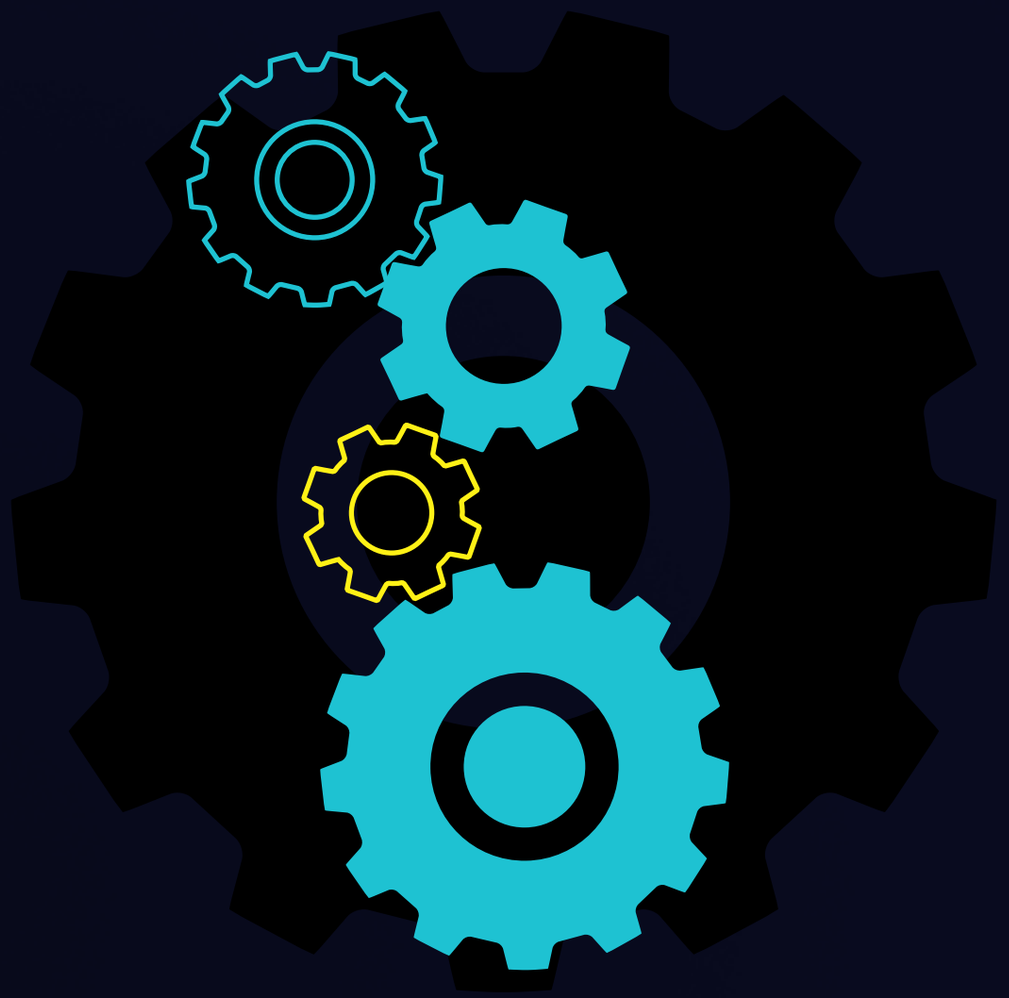
Ownership–Right to use Separate mode

1. Privacy data is kept and controlled by data collectors, allowing only data owners to access
2. The data owner can only access his own data, and only the index of his own data is stored in the public chain.
3. The data user only saves the invitation record in the public chain, does not save the obtained user data, and can only write the invitation record under the authorization of the data owner.
4. Breaking data isolation and making data fusion more valuable

The separation mode of the three can be applied to a wide range of scenarios other than health data, such as credit information systems, precision advertising systems, etc.

Part 1 Pain points and business value

Business value and meaning



Reshape the value chain

1. In the past data transactions, the owner did not have control
2. Let data owners join as part of the consortium
3. Encourage data owners to generate data and guide users to use corresponding services

Part 1 Pain points and business value

Business value and meaning

The inevitable choice in the post-big data era

1. Big data has become a must-have resource for business
2. The interpretability and privacy of big data requires us to use big data more carefully
3. Unlimited use of big data can lead to uncertain results
4. Use blockchain to establish the order for data acquisition and use

Part 1 Pain points and business value
Business value and meaning

The inevitable choice in the post-big data era

1. As the EU announces GDPR regulations, respect for user data privacy is gaining more and more attention.
2. Blockchain + big data, let users decide the purpose of their own data
3. Core data is stored on the blockchain, reducing data storage security risks and reducing privacy leaks

Part 1 Pain points and business value

Business value and meaning

Open and credible alliance chain

1. The User Organization (UO) is maintained by the public platform and is open to all users.
2. The UO only manages the issuance of user certificates (Fabric-CA) and the maintenance of UIC channels, does not provide intermediate forwarding.
3. All users can directly access the data on the chain, avoiding the intermediate link to destroy trust

Part 1 Pain points and business value

Business value and meaning

Certificate-based authorization mechanism

1. More reliable and safer than traditional username key management
2. Suitable for decentralized scenes
3. Complete software and hardware facilities for more precise management/authorization
4. Has been widely used in the commercial field, can enter this field of consumption through this opportunity

Part 2 Architecture and processes

1. Roles and Channels
2. Business Process

Part 2 Architecture and processes
Roles and Channels

System roles

System will have three roles::
UO: User Organization，retain the ownership of data
HO: Health Organization，Every institution that can provide health data, including hospitals, medical centers or smart device manufacturers, is a member of HO.
DUO: Data User Organization，Every institution that wants to use personal health data is a member of DUO.

Part 2 Architecture and processes
Roles and Channels

Channel settings

UIC: User Index Channel，All users uniformly store channels, only record encrypted data ID and HO ID

HDC: Health Data Channel，Each HO member has its own independent channel for recording specific health data

DRC: Data Request Channel，Used to record the DUO's request for user data and the user's response，also can be used as a basis for settlement

Separate data by physically separating to ensure privacy

It should be noted that although UO joins HDC and DRC as an organization, UO peers do not join HDC and DRC channels to achieve complete data isolation.

Part 2 Architecture and processes

Business Process

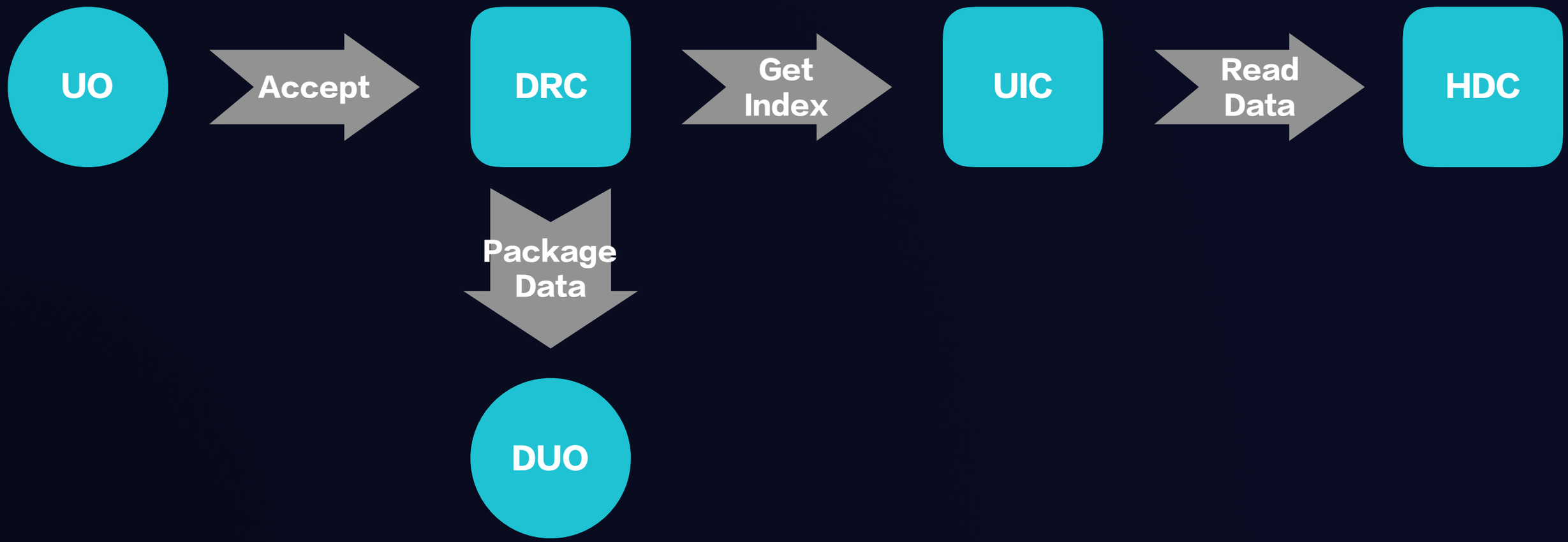
When the user completes the data collection in HO, HO will add the data to the HDC channel, and the corresponding user client will add the data index to the UIC channel.

Part 2 Architecture and processes
Business Process

When the data user (DUO) wants to initiate an invitation to the data owner (UO), the UO needs to authorize the DUO to write permission first, preventing the DUO from generating too much invitation data to harass the user.

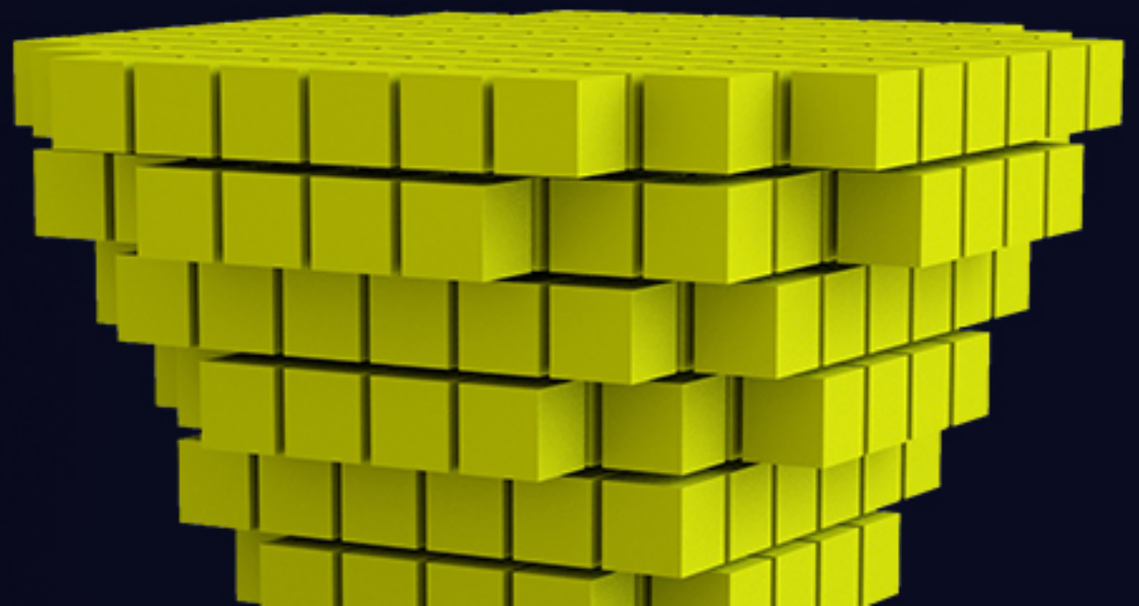
Part 2 Architecture and processes

Business Process



When the data owner agrees to apply, the corresponding data is obtained from the HDC through a complex call chain. The DRC packages the data and sends it to the data user, DRC does not store the packed data result.

Thank you



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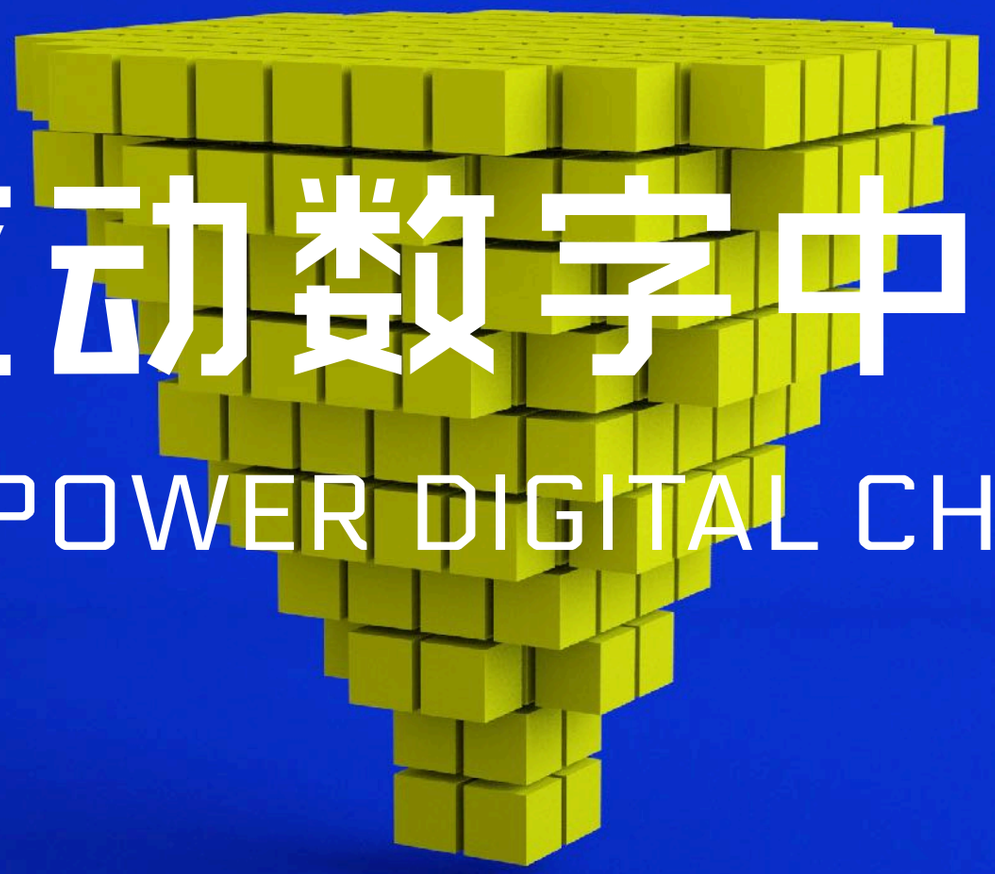

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