Heap&Bloc

PROJECT PRESENTATION

MAXONROW

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Our Team

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Our values

In perfect harmony with the MAXathon hackathon

- Passion for innovation
- Passion for healthcare
- Passion for technology

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Introduction

Today and more than ever, lots of health data are generated. Storing data on paper is hardly possible nor convenient. As a result, electronic health records appeared in our lives. However, this innovation was not used to its advantage due to the remarquable lack of security. The data stored in hospitals and other associated organizations are vulnerable to various security threats, attacks and remain scattered. It is therefore time to set up a decentralized system

01

The context

The major issues, the needs
The technology used

Our major issues

Non- Interoperability

Your health data is dispersed between doctors, health centers, pharmacies and belongs to third parties which will lead for example to an ill-informed diagnosis

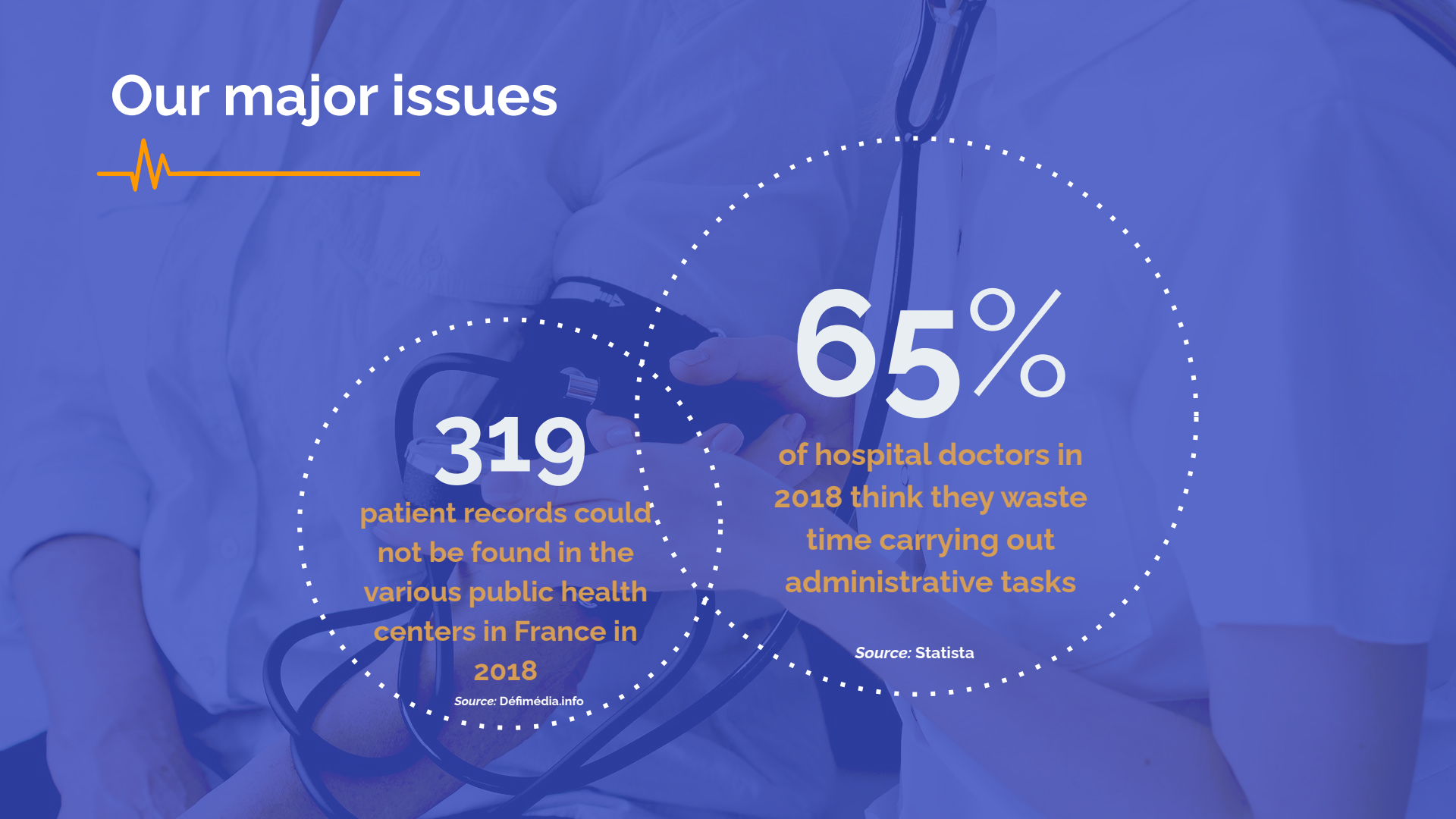
Security

Patients deny access to all of their protected health information to avoid any privacy concerns, creating resistance between healthcare organizations

Waste of time

The same medical records are stored across different hospitals, tests are repeated, the same questions are asked . This considerably delays the administration of the

Our major issues



319

patient records could not be found in the various public health centers in France in 2018

Source: Défimédia.info

65%

of hospital doctors in 2018 think they waste time carrying out administrative tasks

Source: Statista

Technology used

- This project is based on the use of Blockchain and Cryptography
- These technologies make it possible to respond to a major challenges of nowaday healthcare
- The blockchain allows medical interactions to be signed and shared in a safe and reliable way.

  With the RSA technology, data is only shared with wanted healthcare actors. The rest of the data is safe and secure.
- Blockchain provides the healthcare industry with a standard and consistent database of real-time patient data to work with.

02

Our solution

Overall description
Our model and our added value

Our model

Blockchain process

In our blockchain, we identify prescriptions, x-rays, diagnostic reports, patient hospital visits, treatment details, administrative documents as **transactions**. Transactions are gathered in block and validated through decentralized links in the blockchain. Content is encrypted through the asymmetric RSA method.

While generated RSA keys can be shared, personal private RSA keys never leave one's personal keychain. Thus, with our system, patients will have data sharing options that, by design, ensure traceability and safety.

Our model

Our application enables two things :

- A proof system to sign transactions
- A encryption system that empowers fine grain control over sharing privacy

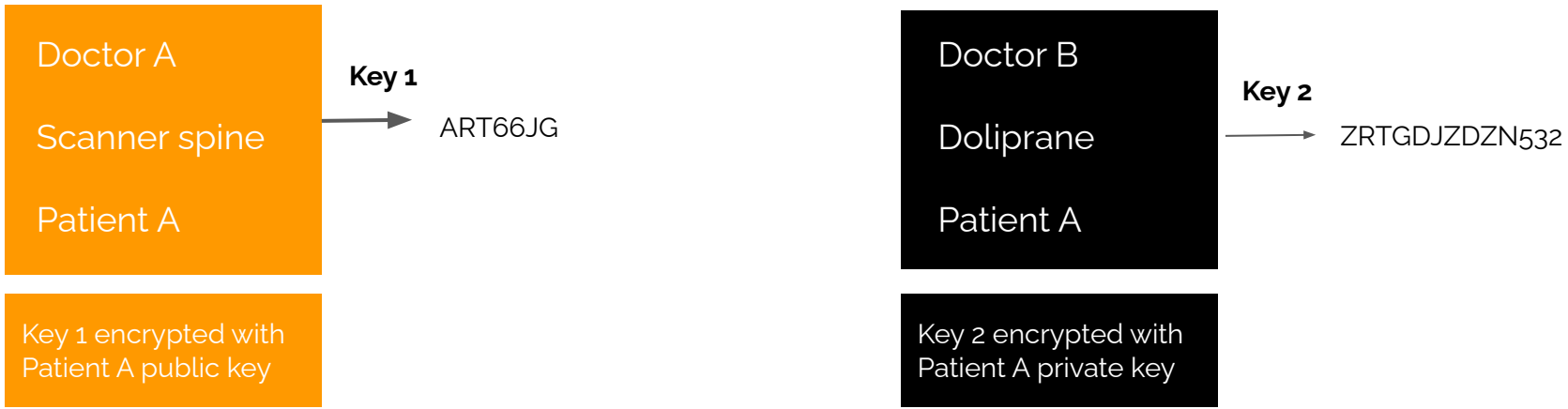
This safe and secure platform can become a new medical standard, where every actor can store its data with confidence, safety, and retrieve the data he/she needs easily.

Concrete case (part 1 /3)

Medical interactions are considered as a transaction with 3 elements :

- The medical professional
- The content
- The patient

The transaction is considered as a block, and is written in the blockchain.
The content is encrypted, and a decryption key is written in the blockchain, with the patient private key.



Concrete case (part 2 / 3)

Now let's suppose a medical professional needs content A and B from patient A.

- Patient A will look into the key blocs and will decrypt the keys with its private key.
- Patient A will grant the keys for content A and content B to the medical professional
- The professional can now access these specific data.

The patient is at control at all times.

Concrete case (part 3 / 3)

To fully use the described backend, we provide a front end composed of two parts :

- A mobile app for the patient
- A web app for the medical professional

The medical professional can ask for wanted datas by categories : allergies, operations …
A notification is sent to the patient. If he agrees, the app will send the decryption keys to the doctor webapp.
With the webapp keys, the doctor can access the data she needs.

Our added value

Time saving

With better managed record keeping, physicians can use this time for patient treatment

Secure data exchange

Our blockchain secures data with private keys. Only the patient himself decides what he wants to share and to whom.

Better collaboration

With our system, the different actors in the health (various specialities/geographies) can collaborate better together with great confidence.

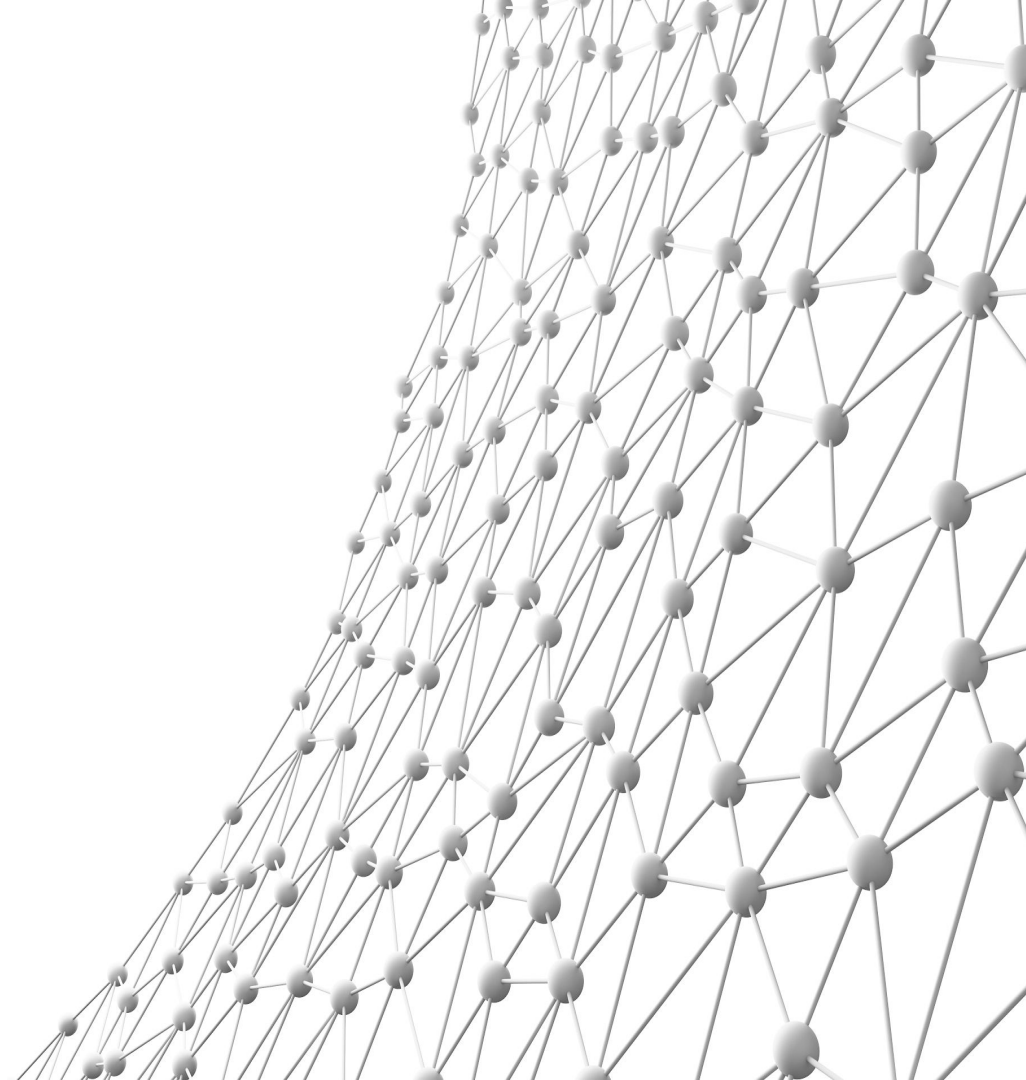
Health data monitoring

Your data is precious and with our blockchain, you are in control and you can manage, track your own data.

03

Functional description

Our process



Our process

01 A key management platform

02 Access to medical data
by specific key for each request

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03 Secure data exchange, monitoring

First use case

When the medical professional interact with the patient, the application on the medical side writes the transaction block. The content is encrypted with a key. The key is encrypted into a block with the patient public key.
This enables a common, safe, repository to store medical data.

Second use case

When a medical professional want to load data about a patient, a demand is sent to the patient. If accepted, the patient will use its private key to send the keys needed to decrypt the content. The medical professional can then access all the asked data.

Conclusion

We truly believe that a Blockchain solution has its place in today's healthcare ecosystem. Our system aims to make the work of healthcare providers easier by securing medical data. By saving a lot of time and gaining efficiency in keeping health records, doctors can use that time for the patient and their treatment. We believe our project has a great positive social and environmental impact.

Thanks

Do you have any questions?

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